

**NATURAL
ENVIRONMENT
RESEARCH COUNCIL**

Evaluation of the Peer Review College

**Final Report
September 2008**

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Summary and Recommendations

NERC's Peer Review College was established in June 2003, replacing the previous five standing science area peer review committees. Its main function is assessment of responsive mode grants, fellowships, some KE schemes and Open CASE studentships. The collegiate system was developed with the specific objectives of:

- reducing the burden of peer review on the external community and so improving reviewer response rates;
- providing better review of inter- and multi-disciplinary research compared to the previous fixed panels;
- ensuring a consistent level of peer review for all proposals and equitable assessment across all science areas; and
- involving a wider section of the environmental sciences community in NERC's grant assessment bodies.

This Evaluation has been designed to measure progress against these objectives and also to:

- assess whether the College and associated review process are delivering the quality of peer review necessary to identify the best science;
- determine whether the College has the confidence of the environmental sciences community; and
- recommend any changes necessary to improve the performance of the College and extend its use.

To what extent is the College fulfilling its original objectives?

The College has achieved the aim of reducing the burden of peer review on the external community (excluding the College). Although overall reviewer response rates have improved, the response rate of external reviewers has decreased slightly. This appears to be due more to general 'referee fatigue' than a result of the College.

It is difficult to determine whether or not the College provides better review of inter- and multi-disciplinary research than the previous fixed panels. Such proposals are not easily identified in order to track their success. From the limited evidence available, it appears that more multidisciplinary proposals are being received and so more are being funded. However, these proposals appear to be no more or less likely to succeed than under the peer review committee system. The problems of finding suitable reviewers who can assess multidisciplinary research remain and are not specific to the College system.

The College has successfully provided a more consistent level of peer review for all proposals: all receive at least three reviews and those that progress beyond the sift stage receive a higher average number of reviews than before. Since College members are trained and undertake multiple reviews every year, consistency of reviewing is promoted. However, differences in assessment across science areas still appear to exist and this problem should be addressed.

The College has succeeded in involving a wider section of the environmental sciences community in NERC's grant assessment bodies and has given more researchers an opportunity to gain an insight into the grant assessment process.

Are the College and associated review process delivering the quality of peer review necessary to identify the best science?

Consultation revealed that opinions are divided over whether or not current processes consistently identify the best science. The majority of College reviews are carried out by members declaring a good level of expertise in the field and members find the training and guidance provided by NERC helpful. Members themselves have greater confidence in the process than others who responded to the consultation, partially because of their greater insight into its operation. Overall, the evidence suggests that the majority of College members are delivering high quality peer review. However, issues were raised about the reviews provided by some members, the sift process and operation of moderating panels; recommendations are made to address these.

Does the College have the confidence of the environmental sciences community?

The community expressed a wide range of views on this. Some praised the inclusiveness of the College, while others felt that the proportion of more experienced members was now too low. Consultation responses cited variation in the quality of College reviews and feedback from moderating panels. To raise confidence, changes to the mechanisms for recruiting College members and selecting moderating panel members are encapsulated in the recommendations.

What changes are necessary to improve the performance of the College and extend its use?

The Evaluation Project Board concluded that the College is working sufficiently well for it to be retained in an improved and evolved form, rather than being replaced. The proposed recommendations aim to achieve this and the rationale for them is explained in the Results and Discussion section. It is not proposed that the previous peer review committee system is reinstated or that a new structure is created. Instead, the aim is to retain the benefits of the current College system, but to re-introduce certain beneficial aspects of the peer review committees and to learn from the evolving practices of other research councils.

Many of the recommendations, if approved, will need further consideration of the options for implementation. The overall resource implications will need to be taken into account.

Recommendation 1: The quality and balance of College membership should be improved.

The College needs an appropriate balance of high quality scientifically experienced and earlier career stage reviewers, including expertise to cover all of NERC's remit.

- 1.1 The balance of recruitment mechanisms should be changed** to involve:
 - 1.1.1. more use of direct invitations, based on recommendations from individuals such as heads of university departments and NERC research centres, NERC boards and staff (following visits to research organisations); and
 - 1.1.2. less reliance on self-nomination.
- 1.2 There should be more encouragement for past College members to serve for a further term and current members should have the option of a fourth year by mutual agreement.**
- 1.3 NERC should develop guidance on the experience expected for College membership.** This guidance should:
 - 1.3.1. outline the level of scientific experience expected for the majority of members;
 - 1.3.2. allow for some members with different types of experience and at varying career stages; and
 - 1.3.3. define a minimum level of competence for all members.
- 1.4 NERC should consider how to increase the profile of the College within the academic and user communities, and the recognition and status of membership.**
 - 1.4.1. this was the most commonly cited way to encourage membership;
 - 1.4.2. although mainly outside the remit of this review, it might encourage high quality College members and panel chairs; and
 - 1.4.3. NERC should alert Heads of Departments/Vice Chancellors to the College members in their departments/organisations.

Recommendation 2: NERC should implement changes to optimise the effectiveness of moderating panel meetings.

- 2.1. NERC should set up a pool of potential panel chairs (who have previous College experience), with additional training provided.** This will:
 - 2.1.1. recognise the chair's key role in ensuring panel meetings are conducted effectively and fairly;
 - 2.1.2. promote greater continuity between rounds, consistency in use of grades, confidence in the

system and a link between the College and SISB; and
2.1.3. increase the status of, and confidence in, panel chairs.

2.2. NERC should increase consistency and ‘corporate memory’ between panel meetings for each grants round. In addition to the pool of chairs, options are:

- 2.2.1. for the chairs of the next round of Standard Grant panel meetings to be chosen early enough for them to attend one of the previous Standard Grant meetings; and
- 2.2.2. to include 2-3 members from the previous panel meeting each time. This ‘rolling membership’ would also help to increase the overall experience level of panels.

2.3. The process for selecting moderating panel members should be improved. Ensuring panel membership with an appropriate balance of experience, expertise and commitment emerged as key concerns for the community. Mechanisms may include:

- 2.3.1. providing more guidance for those selecting panels, possibly including consultation with panel chairs during the selection process;
- 2.3.2. providing potential panel members with earlier warning of meeting dates to increase availability;
- 2.3.3. assigning panels to meeting dates earlier; and
- 2.3.4. asking ‘rolling’ panel members to hold a selection of meeting dates.

2.4. More formal mechanisms are needed to ensure panel members read, and contribute to the discussion on, more proposals than those they are presenting to the panel. This is to ensure that all proposals receive a fair and consistent level of assessment, with no one panel member having a disproportionate influence on the outcome. Possible mechanisms are:

- 2.4.1. requiring all panel members to have some level of acquaintance with every proposal being considered;
- 2.4.2. giving each member a list of extra proposals they should read thoroughly;
- 2.4.3. allocating three introducers per proposal; and
- 2.4.4. briefing chairs to pick any panel member to comment on a proposal.

2.5. For proposals at the edge of a panel’s remit, NERC officers should be encouraged to seek additional comments from members of other panels more often. This could include those of other research councils; panel chairs could be asked to advise if necessary.

2.6. NERC should reinforce that introducers must act as moderators not referees. They should:

- 2.6.1. be able to give their views as well as commenting on the reviews provided;
- 2.6.2. not usually raise substantive new issues to which applicants have not had the opportunity to respond; and
- 2.6.3. not overrule judgements of experts in a field.

2.7. ‘Pre-scores’ should be obtained from introducers before panel meetings. This should help with structuring meetings, benchmarking and ensuring that all panel members’ original views are considered, regardless of their level of experience.

2.8. NERC needs to re-define the secondary grading criteria and ensure consistency in their use by panels when ranking grants. The new joint research council framework for grading criteria must be taken into account.

2.9. NERC should develop a better mechanism for encouraging panel members to read the relevant policy papers before meetings. Chairs could help to achieve this. NERC should also ensure that guidance includes all relevant issues, particularly grading ‘adventurous’, multidisciplinary and technology proposals and assessing costs.

2.10. The feasibility of holding some panel meetings in locations other than Swindon should be considered. More easily accessible locations were requested by many College members and holding panel meetings elsewhere (e.g. at research organisations) might improve links with the wider academic community.

Recommendation 3: NERC needs to take steps to increase the level of confidence in its peer review process.

- 3.1. NERC should further reduce the proportion of low expertise initial College reviews obtained.**
There must be sufficient expertise on the College (Recommendation 1); and targeting should be improved by good descriptions of reviewers' fields of experience. College members need better guidance on what constitutes high, medium and low expertise.
- 3.2. NERC should check the quality of all College reviews of proposals that are to be rejected at the sift stage.** This should increase confidence that the right decisions are being made and enable closer monitoring of college members' performance. The resources required will need to be balanced against the grants budget.

Recommendation 4: Dialogue between NERC and College members, and between NERC and the research community, should be improved.

- 4.1. There should be greater transparency in the grant assessment and College recruitment processes.**
This should include clarification of the role of affiliate members, the sift process and the new mechanisms for handling proposals at research council remit boundaries.
- 4.2. More regular individual feedback should be provided to College members as needed, in addition to the annual performance reports.** This should improve the overall quality of reviews. As well as contacting those providing inadequate reviews, feedback could be given after each round, with evaluation of performance after a member's first year on the College.
- 4.3. There should be a voluntary annual meeting for College members** for networking, two-way group feedback and input to funding assessment policy decisions and broader NERC issues. Additionally, panel members could be encouraged to meet up and network the night before panel meetings.
- 4.4. NERC should promote use of the College website more** and make it easier to find.
- 4.5. An 'exit questionnaire' should be introduced for those leaving the College.**

Recommendation 5: Some changes should be made to the contractual agreement with College members

- 5.1. There should be more parity of workload between College members, with increased feedback provided to science programme officers on under and over-used members.** However, this must not be to the detriment of the review process.
- 5.2. Members should only exceptionally be asked to attend the maximum of five meetings a year,** in recognition of the large amount of work involved;
- 5.3. There should be flexibility, so that those who have not attended any meetings during the year may be asked to undertake extra reviews.**
- 5.4. NERC should discuss the level of members' annual honorarium** and whether a fixed payment is appropriate, given that:
 - 5.4.1. the majority of members preferred the current annual payment to other options;
 - 5.4.2. NERC is the only council that pays College members in this way, but our contract with members means that we achieve a near to 100% College reviewer response rate; and
 - 5.4.3. although inadequate remuneration did not emerge as a barrier to people applying to the College, ~40% thought that higher payment would encourage applications for membership.
- 5.5. Members should be encouraged to mentor** early stage researchers and new College members within their organisations.
- 5.6. The College year should run from 1 July to 30 June, instead of 1 June to 31 May,** so members do not 'roll off' the College just before June panel meetings.

Glossary

AHRC	Arts and Humanities Research Council
BBSRC	Biotechnology & Biological Sciences Research Council
CASE	Previously stood for: Cooperative Awards in Science and Engineering, now referred to only as “Case” (studentship scheme)
Co-I	Co-Investigator
College reviewer	Reviewer who is a College member, used in the initial assessment stage of proposals.
EPSRC	Engineering and Physical Sciences Research Council
ESRC	Economic and Social Research Council
External reviewer	Reviewer who is not a College member, e.g. used in the second assessment stage of Standard Grant proposals.
FAB	Funding allocation and budgeting (project to implement new NERC strategy)
fEC	Full Economic Cost
HEI	Higher education institution
HESA	Higher Education Statistics Agency
HoD	Head of Department
Je-S	Joint Electronic Submission
KE	Knowledge Exchange, previously referred to as knowledge transfer (KT)
MANTRA	Management System for NERC Training and Research Awards
MRC	Medical Research Council
NI	New Investigator
NSF	National Science Foundation (in USA)
PI	Principal Investigator
PRCs	Peer Review Committees (replaced by College in 2003)
RAE	Research Assessment Exercise
RC	Research Council
RCUK	Research Councils UK
RO	Research Organisation
SIM	NERC Science and Innovation Manager
SISB	Science and Innovation Strategy Board
SPO	NERC Science Programmes Officer (responsible for selecting reviewers and panel members, acting as moderating panel secretary etc.).
SSC	Shared Services Centre
STFC	Science & Technologies Facilities Council
VC	Vice Chancellor

Introduction

Background information on the College

The College has grown from an initial membership of 255 to the current total of 403 members. This includes 35 members of the Affiliate College, which was added in 2004 to include science users. Full members are paid an honorarium of £1000 per year and can be asked to review up to 15 proposals and attend up to five panel meetings per annum. The usual term of membership is three years. However, some members are asked to stay on for an extra year if there are no suitable replacements in their area of expertise.

The Affiliate College was set up in 2004, to provide input from members of the science user community, particularly for assessment of knowledge exchange (KE) proposals.

‘Half’ membership was introduced in 2005 for those with insufficient time to take on full membership, or in fields where few proposals are received. There are currently 137 half members. Half and affiliate members agree to review up to eight proposals and attend up to three panel meetings a year, and are paid £500.

The College’s main function is assessment of responsive mode grants, fellowships, some KE schemes and Open CASE studentships¹. College representatives are also included in directed programme proposal assessment panels. Members are occasionally consulted on funding policy issues and process development, although to a much more limited extent than the peer review committees. When the College was set up, a further project to consider expanding its use was envisaged, but has not been carried out.

Most College members are recruited following an annual call for nominations on the NERC website. This is publicised by e-mailing NERC’s lists of contacts, including all heads of departments and NERC grant holders and applicants. Members are selected to replace the expertise of those leaving the College and to rebalance expertise according to trends in the topics of proposals being received. If not needed in the year they apply, applicants are reconsidered each year for the next three years. In disciplines where there are no suitable applicants, people are approached and invited to join the College, based on recommendations of NERC staff with knowledge of the environmental sciences community. The majority of new College members attend a one day training event in Swindon, which includes presentations, group discussions on how to write reviewer and introducer comments and a mock moderating panel meeting exercise. All are also provided with a New Member’s Information Pack, which contains further guidance on writing reviews and participating in panel meetings, in addition to the information detailed on the NERC College members’ website.

College members’ usage and performance are monitored and all are sent an ‘annual report’, detailing the work they have completed as a member, how their review grades compare to the final grades proposals received, whether they responded to availability requests on time etc, as well as asking them to check that the expertise details NERC holds for them are up to date.

Background information on the responsive mode grant and fellowship assessment process

With the introduction of the College, the grant assessment process was revised, adding an initial review by three College members and sift stage. The sift is based on an algorithm using the quality (‘alpha’) grade provided by each College member for a proposal and whether or not they recommend it for funding, weighted by their expertise in reviewing that proposal. Although grades from reviewers with higher expertise are given more weight, normalisation of results ensures that proposals gaining lower expertise reviews are not disadvantaged. A sift meeting of NERC staff checks for discrepancies in the algorithm results; proposals with fewer than three reviews, or with an overall low level of expert review, are taken forward automatically. Those at the borderline, or with a wide range of grades, are discussed in more detail. For Standard Grants, on average 61% of proposals proceed to further ‘external’ (non-College) review and panel meetings.

External assessment has been almost entirely discontinued for Small and New Investigator proposals; after the initial review by College members and sift, external reviews are only sought for proposals that have not received College reviews of a sufficient level of expertise, prior to consideration at panel meetings. An algorithm is not used for Fellowship schemes, but Fellowship sift meetings are now attended by College

¹ CASE: previously Cooperative Awards in Science and Engineering. Further details on NERC’s grant schemes and their assessment can be found on NERC’s website at: www.nerc.ac.uk/funding/

members. Consortium Grant proposals do not go through the initial review and sift stages, but advance directly to external review and panel meetings.

Moderating panel areas are defined flexibly, depending on the number and topics of proposals received for each closing date. Panel membership is selected from all available College members, to cover the range of proposals that are successful at the sift stage and so are to be considered at panel meetings. Membership therefore varies from round to round. There are typically five Standard, two Small, one New Investigator and one Consortium Grants Panel per closing date.

Reasons for evaluating the College

This Evaluation was commissioned by SISB at its meeting in July 2007 (paper SISB 07/29), to investigate whether the College is meeting its original objectives and has the confidence of the external community, and to consider any areas where improvements could be made.

Additionally, the implementation of a joint Research Council Shared Services Centre, which will include grants administration, and the recent RCUK Cost of Peer Review Project, both require that councils identify efficiency savings and work towards harmonised processes. This review will provide NERC with an understanding of which aspects of the current system are valued by the community and should be retained.

The specific objectives of this evaluation were:

- i. To consider the extent to which the College is fulfilling its original objectives.
- ii. To assess whether the College and associated review process are delivering the quality of peer review necessary to identify the best science.
- iii. To determine whether the College has the confidence of the environmental sciences community.
- iv. To recommend any changes necessary to improve the performance of the College and extend its use.

Conduct of the Evaluation

To achieve these objectives, this Evaluation has examined many aspects of the College, including its membership, recruitment process, payment, mechanisms of selecting College reviewers and panel members, operation of panels, and the effectiveness of areas of the grant assessment process that were introduced with the College (e.g. the initial review and sift stages). It has not included evaluation of the Affiliate Peer Review College, because this has been carried out separately (2007 Review of the NERC Affiliate College: paper SISB 08/27). It has also excluded other parts of the grant assessment processes, assessment criteria and reviewer guidance, which were part of the recent Blue Skies Review (2004-2006).

The Project has been undertaken by a Team drawn mainly from the Science and Innovation Funding Business Group (see page 59), overseen by a Board comprising Phil Newton (NERC Director of Science Delivery), replacing Steven Wilson (NERC Director of Strategy and Partnership) as the Chair and Sponsor, Harry Elderfield (University of Cambridge, representing SISB) as the Customer and Judy Parker (Formerly NERC Business Manager for Science and Innovation Funding, now Head of Communications), who was the Supplier at the initiation stage. Kathy Whaler (University of Edinburgh) provided input as the alternate SISB representative. This final report of the Evaluation summarises the findings and recommendations for SISB's consideration.

Context

When interpreting the results of this Evaluation, there are several contextual factors to bear in mind. The first of these is the increasing number of grant proposals that NERC is receiving. This was one of the main triggers for changing the peer review committee system and introducing the sift. The number of Standard Grant proposals had risen from 457 in 2001² to 520 in 2003 and this was placing an unsustainable strain on the peer review community. Since introduction of the College this upward trend has continued, with 574 Standard Grant proposals submitted to NERC in 2007. Taken with the evidence of 'referee fatigue' and consequent falling review response rates that many funders are experiencing, this leads to the conclusion that a return to the previous peer review committee system is not a tenable option.

² Each joint proposal is counted as one proposal.

The proportion of multidisciplinary proposals being submitted is also increasing and consequently the challenge of finding appropriate reviewers for these proposals has grown. NERC has publicised that it wishes to encourage multidisciplinary research and provides guidance to reviewers. The research councils have developed a framework for dealing with proposals at their remit boundaries, which has resulted in more co-funded responsive mode research. However despite these measures, ensuring fair assessment of multidisciplinary research remains challenging.

Another aspect to consider is the need for efficiency in the peer review process. In 2006, the research councils jointly carried out a project to determine the full economic cost of their peer review process and the potential for improving its efficiency, whilst maintaining effectiveness³. This concluded that improving the efficiency and effectiveness of peer review are not mutually exclusive and that both these aspects are needed to ensure that full benefit is derived from the UK's research investments. The councils are therefore committed to improving peer review efficiency in order to maximise the resources available for research.

It is human nature that people responding to consultations are more likely to include comments if they have negative than positive views. Grant applicants are also more likely to contact NERC with a complaint than to give positive feedback. Moreover researchers' opinions are influenced by outcomes of recent applications for funding. Since ~80% of proposals are unsuccessful, the majority of the community might be expected to have a negative view of the assessment process. Data gathered for this Evaluation also demonstrated that since the College was introduced, there have been a total of ~4303 applicants and ~1875 award holders. Although some individuals will have had both funded and unfunded proposals, this suggests that more than half of the 'applicant community' have not been successful during this period.

There are no comparative data on the level of contentment with NERC's previous peer review committee system, although similar types of complaints were received as under the College system. However, useful comparative research into satisfaction with the peer review process has been carried out in Australia⁴. This included a survey in 2004-05 of applicants to both the Australian Research Council and the National Health and Medical Research Council. Although these research councils have different assessment processes and committee structures to each other and to NERC, applicants for funding expressed similar views about them. The majority of applicants to the Australian research councils believed that one of their recent proposal reviews was not of a suitable standard (16-30% that two or more reviews demonstrated a lack of expertise); around 40% thought that the review process was unsuitable; and a similar proportion that the funding outcome did not match their understanding of the reviews. Additionally, around 30% did not think that panel membership was appropriate; the reasons cited included inadequate disciplinary coverage and perceived conflicts of interest.

Respondents to the Australian consultation also expressed very similar criticisms in their free text comments to those taking part in this Evaluation. These included concerns about the expertise of reviewers selected, lack of transparency in the peer review process, a perception that panels ignored referees' comments, the feeling that there was bias against innovative and multidisciplinary research, lack of detailed feedback and the overall level of funding. As with a few NERC applicants, some believed success to be as random as a lottery.

One of the underlying reasons suggested in the Australian study is that applicants tend to see only assessments of their own proposals and think that they should be successful because the reviewers seem supportive. However, those who have an overview of many reviews learn how to interpret them, for example "Understanding that 'good' and 'worthwhile' work is not competitive with 'outstanding' and 'world-leading'" when funding is limited.

The Australian study suggested that if success was defined as having had at least one grant awarded in the previous four years, successful applicants were as likely to hold negative views as unsuccessful applicants. However, more in depth analysis suggested that those who consistently (100% success rate for one or more applications) or frequently (50% or greater success rate for two or more applications) received grants were more likely to regard the selection processes as satisfactory than those who were less successful. Although

³ RCUK Efficiency and Effectiveness of Peer Review Project 2006

⁴ PhD thesis in preparation, Karen Mow, University of Canberra.

dissatisfaction was shown to increase with greater lack of success, even successful groups of applicants had a significant proportion of dissatisfied members.

Evidence from the RCUK peer review survey showed overwhelming (93% in favour) support for peer review, but similar concerns about how well the UK research councils' processes actually operate, particularly the quality of referees, how they are selected and the operation of panels. So all three surveys suggest that although grant applicants believe that peer review is essential, many are critical of the processes employed by the research council they apply to, despite the wide variation in these processes between councils. So although this Evaluation has revealed that many members of the environmental sciences community are not content with the quality of review provided by the College overall, the focus of the response should perhaps be less on the generality of this 'expected' negative finding, and more on the specific concerns raised.

Methodology

The main components of the Evaluation were data analysis and consultation with College members, the external community and NERC Swindon Office staff.

Data analysis

Work was divided into a series of 'work packages', with one Team member leading on each. Data were collated mainly from NERC's back office grants database (MANTRA) and the College spreadsheets containing information about activities undertaken by members. Only responsive mode grants and fellowships data were included. When comparing recent data with pre-College data, it should be noted that the College was introduced in June 2003, so 2003 data include College and pre-College assessments.

Work package 1: Peer Review Burden

Data were analysed to answer the following questions:

- What effect has using the College had on overall referee usage and individual review load?
- How have referee response rates changed since introducing the College?
- Has the use of the College led to a more consistent number of reviews obtained?
- Since using the College, what percentage of proposals have been sifted out after the initial stage and what effect has this had on overall reviewer requirements?

Work package 2: Multidisciplinary Research

- Variation in science areas covered by moderating panels from round to round was assessed and compared with the previous fixed peer review committees. Up to December 2005, panels were named according to their subject areas, but since have been referred to as Panel A etc.
- As a broad indicator of multidisciplinary, the proportion of proposals and awards covering more than one science category (earth, atmospheric etc.) before and after introduction of College were compared.

Work package 3: Consistency of Review

This considered the following areas:

- Expertise levels stated by College members in carrying out initial reviews for all College reviews since 2003; expertise levels were also compared with grades allocated for all closing dates in one year. The data are based on members' own judgement of their expertise.
- Distribution of final grades allocated by the previous peer review committees in 2001/02 compared with those awarded by College moderating panels. However, it should be noted that invited resubmissions (R* grade) have not been allowed since the College was introduced.
- Success rates by discipline, before and after introduction of the College (using the previous NERC science areas: atmospheric, earth, freshwater, marine and terrestrial sciences).
- Grades given by initial College reviewers versus final panel grade for one College Standard Grants round.

Work package 4: Inclusiveness

Data on College membership and applicants were analysed, including:

- Number of College members (including half and affiliate members) each year. Because of when the College was set up, the College year runs from 1 June to 31 May.
- Number of members involved in panel meetings each year, compared to the peer review committee system.
- Balance of College membership and applicants in terms of gender, type of institution, country (England/ Scotland/ Wales/ Northern Ireland) and experience level (using title as a broad proxy).
- Percentage of reviewers approached in each country (UK and international) before and after introduction of the College.

Work package 5: Quality of Peer Review

Information was gathered on:

- Proportion of College members who have the title Professor, Dr etc., compared with members of the previous peer review committees, as a rough proxy for level of experience.
- Whether there was any correlation between title of College member and the frequency with which they stated they had high, medium or low expertise in carrying out reviews.
- Quality of reviews provided by College members versus external reviews. This was based on a subjective analysis (by a Team member not connected with the grants process) of the comments on a random sample of ~20% of proposals considered by each panel for one Standard Grants closing date.
- The distribution of grades given by external reviewers before and after introduction of the College for comparative rounds, to assess whether quality of applications sent to external review has improved since introduction of the sift.

Work package 6: Community's Confidence in the College

This was mainly assessed via the consultations. However, other evidence gathered was:

- Feedback and opinions on the College and associated assessment processes received from various sources since the College started, collated by topic. Sources included: College training events, moderating panel meetings, the Blue Skies Review consultation, complaints, e-mails, NERC regional events and Heads of Departments' meetings.
- Assessment of any bias in favour of College members by comparing their proposal success rates before and after becoming College members with those of non-College members.
- The percentage of those applying who are taken on to the College, and what percentage of the available community has applied to join.

Work package 7: Areas for Improvement

Again, most of the input was from the consultations, but information was collected on:

- Workload of College members in terms of number of reviews completed and meetings attended by members each year.
- Proportion of members who are typically available to do reviews for a grants round and proportion who do not reply to availability emails.
- Mode of operation of other research councils' peer review colleges, gained from discussions with colleagues and websites.

Consultation

The College consultation was conducted via a web-based questionnaire, comprising 43 questions: the majority were optional and involved ticking boxes, with some opportunities to add free text comments (questionnaires available as Appendix 3). It was trialled by three College members before being made live on 4 March 2008. Both current and past College members were invited to respond. Affiliate members were notified so they had the option to contribute, but it was recognised that they had recently been asked to fill in a questionnaire for the Affiliate College Review. When the consultation closed on 21 March, there were 266 responses (including partial responses).

The external consultation was set up in the same way, but consisted of only 20 questions and was live from 4 - 27 March. It was advertised on the NERC website, and Heads of university departments, contacts signed up to NERC's listservers, all NERC grant applicants and grant holders were alerted to it. There were 641 responses in total (including partial responses), estimated to be ~11% of the environmental sciences community that applies to NERC for funding. Sections of each set of consultation results were allocated to individual Team members to analyse.

Representatives of all groups of NERC Swindon Office staff who interact with the College in some way were also consulted at meetings or focus groups: science programme officers (SPOs – who assign reviewers, choose panel members and act as panel secretaries); science and innovation managers (SIMs – who are responsible for overseeing activities in traditional NERC science disciplines); science and innovation senior staff (directors and business managers); and research grants and training awards teams (RGT and TAT – who deal with the administrative aspects of processing grants and fellowships).

Results and Discussion of Issues

This section covers data from NERC databases and the results of consultation with NERC staff, College members and the external community for each of the issues considered by the Evaluation.

Consultation responses

College consultation

Those responding to the College consultation comprised 63.5% current members (of which 42.6% were full members, 20.5% half members and 0.4% affiliates) and 36.5% ex-members. 85 respondents included general comments, which have been included in appropriate sections below. In this chapter, charts showing College consultation responses have bars with diagonal shading.

Open consultation

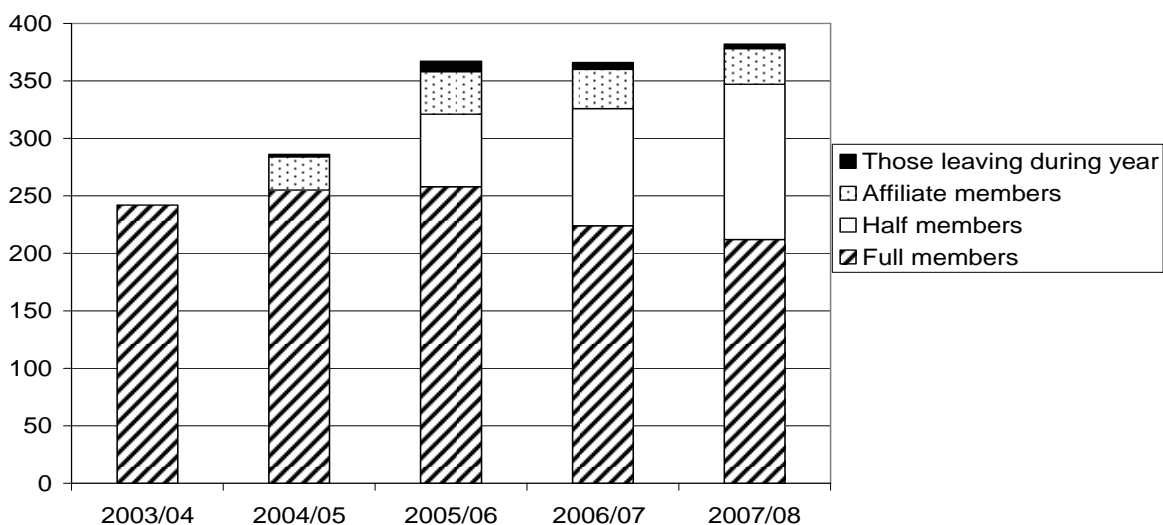
The majority (84%) of respondents were based at HEIs, 10% at research councils (including institutes), 3% at other public sector organisations, 1% at charities and 1% at museums and/or botanic gardens. The remaining 1% included those from the private sector, collaborative centres, environmental consultancies or self-employed. They consisted of 26% professors, 11% readers, 31% lecturers/ senior lecturers, 14% research fellows, 7% research council employees and 5% contract researchers. The remainder comprised other types of researchers, other public sector and private sector employees, technicians, managers and directors, students, emeritus professors and administrators. 17% had been a member of the College, 8% had been a member of a pre-2003 NERC peer review committee and 24% had been a member of another research council College or peer review committee. While 45% of respondents were a current PI or CoI on a NERC grant and 44% had previously held a grant, 68% had unsuccessfully applied for funding at some time. Only 5% had never applied. 200 respondents included general comments, which again have been incorporated as appropriate below. In this chapter, charts showing open consultation responses have bars with solid grey fill.

Membership

Total

Total College membership (Figure 1) has increased steadily, from 242 in 2003/04 to 382 in 2007/08 and 4003 in 2008/09 (not included in graph). A new category of 'half' membership was introduced in 2005/06. Affiliate membership was introduced in 2004/05, but numbers have remained around 30-40.

Figure 1: College Membership



The usual term of membership is three years, but a small number leave the College early (e.g. because they leave the UK or their area of expertise is no longer needed) and some are asked to stay on for a fourth year. In 2006/07, 49 members stayed on to prevent a large loss of membership three years after the College was introduced. In 2007/08, 20 members were asked to stay on, either because their expertise was difficult to

replace or because of the recruitment freeze on affiliate members while their role was reviewed. Members are able to re-apply to the College after a year off; 9% of those joining the College for 2008/09 are ex-College members.

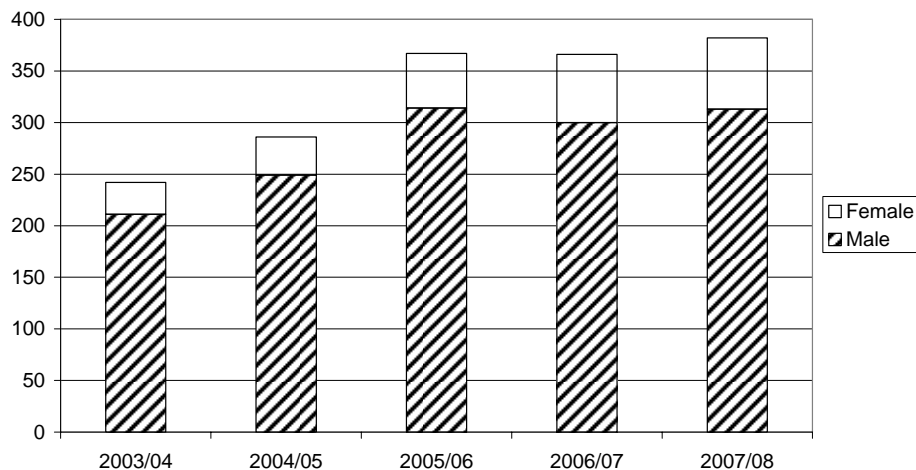
In a survey of membership term, 54% were happy with 3 years, but 22% preferred 4 years and 24%, 5 years. Similarly, most NERC staff agreed that 3 years was appropriate, but some thought that 4 would allow members to gain more experience. They suggested more flexibility to enable ‘good’ members to stay for an extra year, especially experienced chairs.

Applications for membership have declined from 410 in the first year of the College to ~180 in 2007/08 and 2008/09. However, unsuccessful applications from the previous three years are considered with these.

By gender

Membership has been consistently male-dominated (Figure 2), with the proportion of women rising to 18% in 2006/07 and 2007/08. The percentage of female College applicants has increased from 14 to 25% for the 2007/08 College year. For comparison, around 15% of NERC Standard Grant proposals are submitted by women⁵. EPSRC’s most recent College was 12% female when set up in 2006. Data from HESA for 2005/06 show that the proportion of women at lecturer level or above is 25.8% in their environmental sciences category, 21.5% in Earth, Marine and Environmental sciences. Only 22% of respondents to the College consultation thought that the gender balance of the College was appropriate, 19% that it was not, with 59% choosing “don’t know”. Free text comments in both consultations and other feedback to NERC have included criticism of the low female representation on the College and on moderating panels.

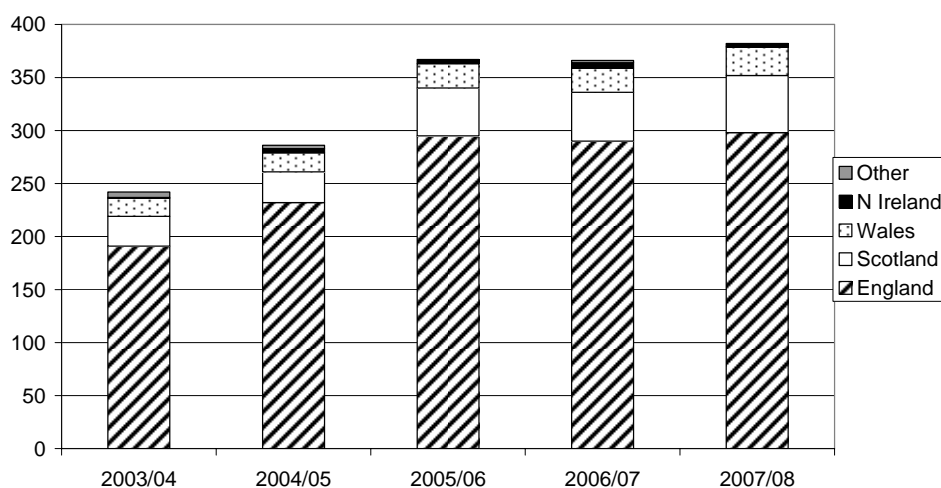
Figure 2: Gender of College Members



By country

As Figure 3 shows, the majority of members are from England, followed by Scotland, Wales and Northern Ireland. This is very similar to the distribution of both College applicants and of grant proposals to NERC (approximately 79% from England, 14% from Scotland, 6% from Wales and 1% from Northern Ireland in 2000-2008, excluding NERC research centres) and that of EPSRC’s current College. There has been no more detailed analysis of members’ geographical distribution, but 40% of College members and 32% of open consultation respondents considered the balance to be appropriate, with only 3% and 10% disagreeing and the others stating that they did not know.

Figure 3: College Membership by Country

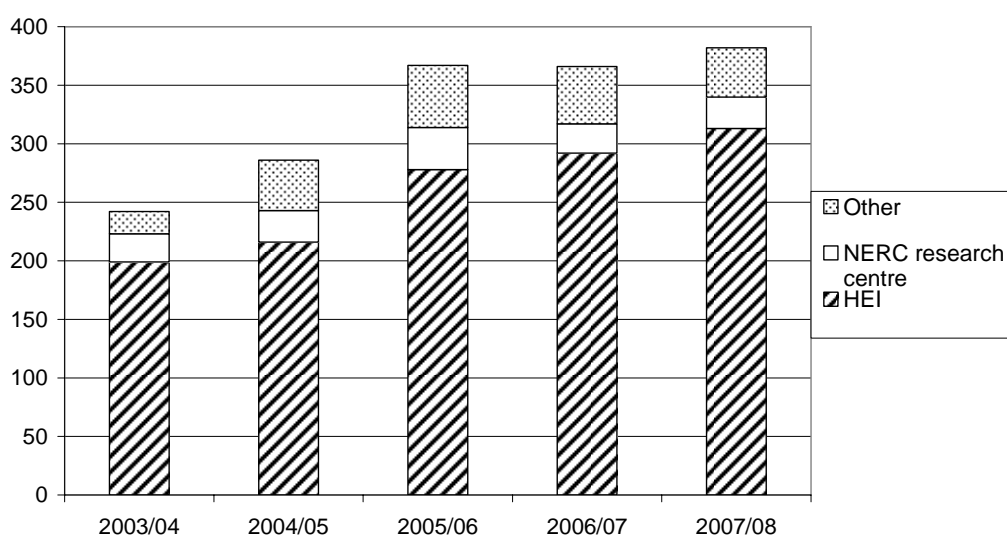


⁵ NERC Blue Skies Review, 2006

By organisation type

Figure 4 illustrates that the greatest proportion of members come from higher education institutes (HEIs), with the percentage from NERC research and collaborative centres having fallen slightly from almost 10% in the first year of the College to 7% in 2007/08. The majority of applicants (including affiliates) are also from HEIs, with between 5 and 17% from NERC research and collaborative centres. Since introduction of

Figure 4: College Membership by Organisation Type



affiliate members, there has been a small increase in membership from other public sector and private sector organisations, currently making up 11% of the College. About half (51%) of College members felt that the balance of research organisations on the College is appropriate, 11% that it is not (38% did not know). Open consultation responses were a little less positive: 34% appropriate, 21% not appropriate, 46% did not know, with some criticising the low numbers of non-university members.

By career stage

Using title as a crude indicator of career stage, the percentage of professors on the College has declined from 45% in 2004/05 to 31% in 2007/08 (Table 1). The percentage applying was highest for the 2003/04 College year (almost 30%) and declined to 19% for 2007/08. Of the 639 new members taken onto the College from 2003/04 to 2007/08, 36% were professors, 62% Drs.

These data were compared to the percentages of members with each title on the last of the previous standing science area committees, each of which had 14 members (Table 1). These show that on average, there was a higher percentage of more senior academics on the peer review committees and in the first two years of the College than there is currently.

Table 1: Title of peer review committee members 2002-3 and College members 2003-current (AS = Atmospheric Sciences, ES = Earth Sciences, FS = Freshwater Sciences, MS = Marine Sciences, TS = Terrestrial Sciences).

	AS	ES	FS	MS	TS	Mean	2003/4	2004/5	2005/6	2006/7	2007/8	Mean
% Profs	43	29	57	43	57	46	44.21	45.10	41.69	38.80	31.41	40
% Drs	57	71	43	57	43	54	55.37	52.80	55.59	58.47	67.02	58
% Other	0	0	0	0	0	0	0.41	2.10	2.72	2.73	1.57	2

Comparison can also be made with applicants for NERC funding since 2003: 28% were professors, 68% Drs and 4% other (Mr/Mrs/Miss/Ms; all data include co-applicants) This suggests that although professors are less likely to apply to join the College than others, the proportion of members who are professors is still slightly higher than that in the community.

Half of College survey respondents thought that the balance of career stage represented on the College is appropriate, while 16% disagreed and 34% did not know. Responses from the open consultation were: 23% appropriate, 28% not, half did not know. Although some College members commented that it was a positive feature that the College had widened access to earlier career researchers and a few would like a higher proportion of these, the majority of comments were from those believing that there are too many early career scientists on the College and that the quality of panel members has dropped. It was suggested that the College

needs people with more experience and that having held a research council grant should be an eligibility condition for applicants. Some did not think that self-nomination should be possible.

Data on the science areas of College members were not available. However, the College and open consultations asked whether the balance was perceived to be right: 38% of the College and 24% of the external community answered that it was, 21% and 30% respectively that it was not, with the remainder stating they did not know. Some College members felt that there are not enough “experts” in all the sub disciplines covered by NERC.

Affiliate members

The Affiliate College was reviewed separately in 2007⁶. Its findings included the need for more clarity about the role of affiliate members. The College consultation therefore asked members whether they understood the role of affiliate members. Only 22% felt they did so fully, 55% partially and 23% not at all. They were also asked whether they thought that affiliate members made a different kind of contribution than full/ half members: 40% answered that they did, only 7% that they did not, but over half did not know.

Discussion of membership issues

This background information on College membership contributes to three of the aims of the Evaluation: determining whether the College is fulfilling its original objective of involving a wider section of the environmental sciences community in the assessment process; assessing the level of confidence in the College; and looking at changes to improve its performance.

Total College membership has grown and the increasing proportion of half members allows greater flexibility to include a wider range of expertise and people with less time to commit. Affiliate membership has stayed more constant and it appears that most members do not fully understand this role, which backs up the findings of the Affiliate College Review that many affiliates themselves are unclear about their function and that more clarity is needed.

The percentage of women on the College is higher than the percentage who apply for NERC Standard Grants, but lower than that applying for College membership; the proportion applying for membership is typical of the environmental sciences community as a whole. The opinions of consultation respondents were divided on whether or not the gender balance of the College is appropriate. Although this needs to be borne in mind when selecting College and panel members, positive discrimination towards women would be inappropriate. There was less concern about the geographical distribution of members (which is similar to that of grant proposals received) and organisational representation. Although most members come from HEIs, this is also true of NERC grant applicants. However several commented that there should be more members from non-HEIs and less bias towards larger universities.

The percentage of professors was used as a proxy for career stage of members: in the first two years of the College it was ~45%, which was similar to the previous peer review committees (although only 29% of the last Earth Sciences PRC were professors). It is now around 31%, which is higher than that of NERC Grant applicants (28% professors) and College applicants (~ 19%). This suggests that professors are less likely than others to nominate themselves for membership, but more likely to be selected when they do. Half of College respondents, but fewer external respondents, were content with the balance of career stage. Although widening access to earlier career researchers was one of the aims of the College and is praised by some, there were more comments about the balance having moved too far towards earlier career scientists and the need for more experienced College and panel members.

This evidence leads to Recommendation 1, that the quality and balance of College membership should be improved. The College needs an appropriate balance of high quality scientifically experienced and earlier career stage reviewers, including expertise to cover all of NERC’s remit.

⁶ Report on the 2007 Review of the NERC Affiliate College (paper SISB 08/27)

Recruitment of members

Table 2 shows that between 2003 and 2007, 1377 people have applied to join the College, of whom 639 (46%) have been taken on (although not necessarily in the year they applied). To estimate the proportion of potential applicants in the environmental sciences community that this represents, it was calculated that there have been 4303 applicants for NERC funding since 2003 (excluding applicants for Fellowships and Knowledge Exchange schemes). Therefore around 32% of the available community has applied to the College, with 15% of these taken on. In disciplines where there are no suitable applicants, staff recommend people to approach and invite onto the College; for 2008/09, these comprised 15% of those joining.

Table 2: Percentage of applicants joining the College.

Year	No. applicants	No. invited to join	% community applying	% community invited to join
2003	410	196	9.5	4.6
2004	412	79	9.6	1.8
2005	277	119	6.4	2.8
2006	90	116	2.1	2.7
2007	188	129	4.4	3.0
Total	1377	639	-	-
Cumulative %	-	-	32.0	14.9

College consultation responses on recruitment

The College consultation asked why members had joined and what they had gained from membership and their responses are shown in Table 3. ‘Other’ reasons included having been approached by NERC to join, wanting to represent their institution and having previous experience of NERC peer review committee membership. Additional benefits stated were a better understanding of UK environmental sciences research and the opportunity to provide advice to younger members of the science community. Only one member commented that they had learnt less than they hoped to.

Table 3: Benefits of College membership.

Why did you join the College? (indicate all that apply)	% of respondents	What have you gained from membership? (indicate all that apply)	% of respondents
To gain a better understanding of NERC’s proposal assessment processes	84	Better understanding of NERC’s proposal assessment processes	96
Wanted to contribute to peer review process	73	Improved own proposal writing	58
To improve own proposal writing	64	Knowledge of type of research NERC funds	56
To interact with other members	37	Useful networking opportunities	35
General interest in type of research NERC funds	37	Furthered career	13
Expertise in their area needed on College	37	Other	4
To improve career prospects/ CV	35		
To give colleagues feedback on how College works	34		
Encouraged by peers	30		
Positive feedback from current/ previous members	14		
Other	5		

There were 100 responses to the question asking if there were any drawbacks of membership, although ~20% of these said they had not encountered any drawbacks, e.g. “None, it’s an excellent scheme and I have thoroughly enjoyed my spell on the college”. However, the concerns raised in this section were:

- not allocated enough time for providing reviews;
- workload is too high;
- clash between timing of review periods and their other work, including writing their own proposals;
- five meetings a year are too many;
- Swindon is a difficult location to reach for meetings; and
- reviewing outside own area of expertise.

College members were also asked what they considered to be the barriers and incentives to others nominating themselves for membership and their answers are shown in Table 4. In considering whether the honorarium is a motivating factor, it should be noted that of current members, only 10 (~ 2.5%) have decided not to accept the honorarium and 18 (~ 6%) have not returned their forms (either having forgotten or chosen not to be paid); thus over 90% are paid.

Table 4: Barriers and incentives to College membership perceived by College members.

What do you consider to be the barriers to people nominating themselves for membership? (indicate all that apply)	% of responses	What do you think would encourage more people to nominate themselves for membership? (indicate all that apply)	% of responses
Not able/ willing to commit to workload	74	Increased recognition of peer review activity by research organisations/ RAE	75
Not confident reviewing outside own specialist area	46	Higher remuneration	41
Would prefer to be invited	31	Better publicity about the College	38
Misunderstanding of role	22	Lower workload	29
Not aware of NERC College	19	More opportunities to contribute to wider NERC activities	29
Inadequate remuneration	18	Increased interaction with other College members	22
Requirement to attend panel meetings	12	More information about role and training provided	17
Other	5	No obligation to attend meetings	10
		Other	5

College members were asked for their views about the recruitment process (Table 5). Free text comments stressed the need for more transparency in the recruitment process

Table 5: College members' views on the recruitment process.

	Yes	No	Don't Know
Is it fair?	49%	4%	48%
Is it transparent?	30%	48%	21%
Should there be clear criteria for membership?	59%	36%	4%
Do you encourage others to nominate themselves for membership?	87%	13%	0%
Should current College members be asked to suggest new members?	60%	36%	3%

Open consultation responses on recruitment

Responses indicated that 68% were aware of the recent call for nominations to the College on the NERC website. However, 66% had never nominated themselves for membership. Responses to the question “why not?” are given in Table 6. ‘Other’ reasons included not being aware they could self nominate, a feeling that they had previously ‘done their bit’ and opposition to the system.

Table 6: Barriers and incentives to applying for College membership from open consultation.

Why people had not nominated themselves for membership (indicate all that apply)	% of responses	What would encourage more people to apply for membership? (indicate all that apply)	% of responses
Not able/ willing to commit to workload	32	Increased recognition of peer review activity by research organisations/ RAE	61
Would prefer to be personally invited to join	31	Being personally invited to join	51
Don't think I have enough experience	30	Lower workload	50
Other	18	Higher remuneration	40
Not aware of NERC College	12	More information about role & training	22
Not confident reviewing outside my specialist area	9	More opportunities to contribute to wider NERC activities	20
Don't understand role	8	More chances to interact with other College members	14
Inadequate remuneration	5	No obligation to attend meetings	10
Requirement to attend panel meetings	4	Other	6

Like College members, respondents cited increased recognition of peer review activity by research organisations/ RAE as the best way to encourage more people to apply for membership (Table 6). ‘Other’ suggestions included a role for College members as ambassadors for their communities, making processes/ guidelines more open and transparent, and changing the role of the panel chair (e.g. associated with a panel for more than one meeting, providing historical perspective and a consultative role in guiding NERC strategy). There was a suspicion that NERC was “running out of people who have not been College members already”. This concern was shared by NERC SPOs, who suggested more encouragement to ‘good’ previous College members to re-apply for another term, particularly in areas where the UK community is small.

The majority (77%) agreed that College members should be paid for their role, only 14% that they should not. Various comments were made on the level of pay ranging from: “£1,000 sufficient” to: “pay members at FEC level”; or “pay all referees”. Respondents’ views on the nomination and selection process for College Members are shown in Table 7.

Table 7: Open consultation respondents’ views on the recruitment process.

	Yes	No	Don't Know
Is fair?	33%	18%	48%
Is transparent?	21%	46%	33%
Does it provide members with appropriate scientific credentials?	30%	30%	40%
Should it be changed so there are clear criteria for membership?	50%	27%	24%

Only 51% of respondents to the open consultation were aware that College members attend a one day training event. Half indicated that College members within their departments/ institutes shared information/ advice with colleagues, while 37% said they did not. There were 284 free text responses relating to College membership. Many of the main categories were similar to those raised in the College consultation:

- panels are not sufficiently experienced to make decisions;
- College has too many early research career scientists as members;
- old system was better;
- selection process should be more transparent;
- members should be invited and not self nominate;
- there should be clear criteria for membership;
- lack of women on the College and on panels;

- members should have held a NERC/ research council grant;
- not aware you could self nominate;
- no feedback provided as to why applicants were not successful in their application to join the College; and
- some science areas are not fully covered in the membership of the College.

Although there was some support for balancing the College further in terms of gender, science area, career stage and institution, a comment more representative of the majority view was: “The idea that there should be equal opportunities on the basis of age or gender is laughable. Science is meritocracy and not a democracy. We need the best scientists reviewing proposal (*sic*)”. Suggestions for improvement included:

- use invitations rather than self-nomination and get advice on membership from scientists, learned societies and subject-specific organisations;
- actively recruit suitable individuals to handle interdisciplinary research;
- use EPSRC reviewers for technology proposals; and
- longer terms on the College, shorter gaps off the College.

NERC staff responses on recruitment

These concurred with the view that College membership should not rely on self-nomination only, because it does not produce the necessary blend of experience and spread of knowledge for the College to be as effective as we would like, given that there is no control over the nominations received and whether they cover all the scientific areas needed. It was also felt that more senior scientists are less inclined to put their names forward because of other demands on their time, leading to a lowering of experience on the College as a whole. Staff therefore believed that a greater proportion of members should be invited and more ex-College members asked to do another term. It was suggested that nominations for those to invite could be sought from peers in the community, SISB, staff at various levels, theme leaders and College members. However, self-perpetuation must be avoided. A list of the areas of expertise needed could be publicised first. Inviting the most used external UK reviewers could also be considered. More advertisement of the College was suggested, e.g. flyers at events such as end of programme meetings. Nonetheless, self-nomination should be kept as an option, since this attracts people who are keen to do the job and provides “new blood”. The call for nominations could be left open all year round, but applications assessed on an annual basis, as currently.

Staff were asked whether the profile of the College needed to be raised within Swindon Office. The SIMs commented that their high workloads prevented greater involvement with the College. The SPOs felt that responsive mode as a whole that needs a higher profile, suggesting more publicity about projects funded. However, directors and business managers did not consider this to be an issue.

Most staff did not believe that hard criteria for membership were necessary, but felt it would be useful to develop guidelines explaining the type of experience needed and the required ability to take an unbiased view. There was a fear of reducing diversity and excluding good people, especially younger researchers, and a desire to achieve a balance of career stages. A suggested guideline was eligibility to apply for a grant and it was proposed that the nomination form could ask for more detail of comparable experience of peer review/ other systems and proposal track record, although a funded grant should not be a requirement for membership. However, staff have received feedback from members of the community who would prefer more formal criteria and greater use of bibliometrics (e.g. number of citations), to ensure that members are seen as leaders in their field.

Staff thought that the selection process worked well enough, so should not be made more labour-intensive. However, it was suggested that SIMs could provide more input and that it would be easier if SPOs worked in science areas.

Discussion of recruitment issues

It is perhaps not surprising that College members are more content with the current balance of the College than the external community. In general although there is some support for further balancing the membership, particularly in terms of gender, there is more widespread concern that the overall level of experience is too low and does not include enough experts in all the sub-disciplines of environmental science. Equal numbers of external respondents thought that the current recruitment process does/ does not provide members with

appropriate scientific credentials. It appears that the numbers now applying for College membership do not provide sufficient choice for the ~130 places a year to be filled, even though unsuccessful applicants from the last three years are reconsidered. NERC has no control over the nominations received, so they may not cover all of the science areas needed and now include fewer senior researchers, probably because of other demands on their time. It is estimated that although ~32% of the available community has applied to join the College since 2003, typically only ~4% now nominate themselves each year, despite most College members indicating that they encourage others to nominate themselves. Therefore ~15% of members now join following invitation rather than self-nomination.

The main benefits of membership cited by College members were gaining a better understanding of NERC's proposal assessment processes, improving their own proposal writing, gaining knowledge about the type of research NERC funds and networking opportunities. Although in most areas the expected benefits were realised or exceeded, not as many as hoped felt that membership had furthered their career. Almost three quarters also cited a desire to contribute to the peer review process as a reason for applying. Only 29% said they had encountered any drawbacks of membership, with evidence suggesting that most find their term on the College enjoyable and useful. Workload, lack of confidence in reviewing outside own specialist area and preferring to be invited were thought to be the main barriers to people nominating themselves. Potential incentives were perceived to be increased recognition of peer review activity by research organisations/ RAE, higher remuneration and better publicity about the College.

The reasons given in the open consultation for not applying to the College and the incentives to application were similar to those suggested by College members. While most were aware of the recent call for nominations, a few did not know that self-nomination was possible. Some felt that there were not enough people left in the community who had not already been on the College, although the data suggest that since 2003, only 15% of the available community has joined the College. This also raises the question of how many times in an academic career it is reasonable to expect an individual to serve on the College. So that the College does not 'run out' of experienced reviewers, it is proposed that NERC should do more to encourage past College members to rejoin and that current members should have the option of a fourth year (Recommendation 1.2).

The Affiliate College Review found that the main barrier to people joining the Affiliate College was again overall time commitments, followed by lack of understanding of the role and knowledge of NERC, and doubts about their ability to review science. Some from public and private sector organisations find it particularly difficult if their organisations will not release them for College work.

The results of data analysis and consultation all point to the need for NERC to widen the recruitment mechanisms for College members, with increased use of invitations, to ensure the necessary blend of experience and knowledge and to recruit those who can assess multidisciplinary research and technology-related proposals (Recommendation 1.1). Various sources of nominations were suggested. Involving the community in nominating College members may also help to promote a feeling of 'shared ownership' of the College between NERC and the community. Although 60% of College respondents said that they would like to be able to suggest new members, staff cautioned against self-perpetuation and a perception of an 'old boys network'. It will help if the areas of expertise needed each year are publicised to those being asked to nominate members and inviting the most-used external reviewers could also be considered. There are, however, good reasons for retaining self-nomination as an option, as described above. Leaving the call for nominations open all year may help to attract applicants. However, NERC needs to consider additional ways to raise the profile of the College within the academic and user communities, and to improve the status of membership, to encourage high quality new members (Recommendation 1.4). It is proposed that NERC adopts MRC's practice of alerting heads of organisations to College members within their organisations.

It is clear that more transparency in the recruitment process and more publicity about the College, the role of members and the fact that training is provided, are needed. College members also need to be encouraged to share information with colleagues, which 37% of respondents said did not happen.

The recruitment process was perceived to be fair by the majority of College and open consultation respondents. However, it was not seen as transparent and many would prefer clear criteria for membership. A few criteria may be useful, along with a clear set of guidelines, as long as this does not reduce diversity and

exclude potentially good (particularly younger) members. Recommendation 1.3 is therefore that NERC should develop guidance on the experience (and ability to take an unbiased view) that members need, as well as the balance of career stages desired; having a funded NERC grant should not necessarily be essential but there should be a defined minimum level of competence. The nomination form should ask for more details of relevant peer review experience, track record as a grant applicant and possibly other bibliometric information. There were some requests for better feedback for unsuccessful applicants for membership, but this would require more resources for the recruitment process.

Level of peer review for responsive mode proposals

Since the introduction of the College and sift process, on average 61% of Standard Grant proposals proceed to the external review stage. Small and New Investigator grant proposals are now reviewed almost solely by the College. Thus the peer review burden on the external peer review community (excluding College members) has been reduced. However if College members are included, the overall amount of peer review by the environmental sciences community has increased slightly. Prior to the College, Standard Grant proposals received a mean of 3.9 reviews. Since the College was set-up, those that go through the two-stage review process receive an average of 5.3 reviews (Table 8), so including those that are sifted out, the average number of reviews per proposal is around 4.5. Small Grants on average receive half a review more than before the College and Fellowships around 1.7 more, but New Investigator Grant proposals have received a more constant number of reviews.

Table 8: Mean number of reviewers for responsive mode grant proposals

*Review process for Small and NI proposals has changed over time to involve a greater proportion of College, and a lower proportion of external, reviewers, so these data only apply to the last two years.

	Pre-College (2000 -2003)		College (2003-2007)				Overall reviews
	Total reviewers approached	Responses	College reviewers approached	College responses	External reviewers approached	External responses	
Standard Grants	6.5	3.9	3	2.9	4.7	2.4	5.3
*Small Grants	3.7	2.5	3.1	3	0	0	3
*New Investigator Grants	4.6	2.9	3.1	3	0	0	3
Fellowships	2001/2: 5.8	3.6	3	2.9	4.7	2.4	5.3

The burden on individual external reviewers has changed little: prior to the College, around 90.5% of individuals reviewed one, 8.5% two, and 1% three or more, Standard Grant proposals a year. Since then, 93.3% have reviewed one proposal, 6.3% two, and 0.3% three or more, proposals annually.

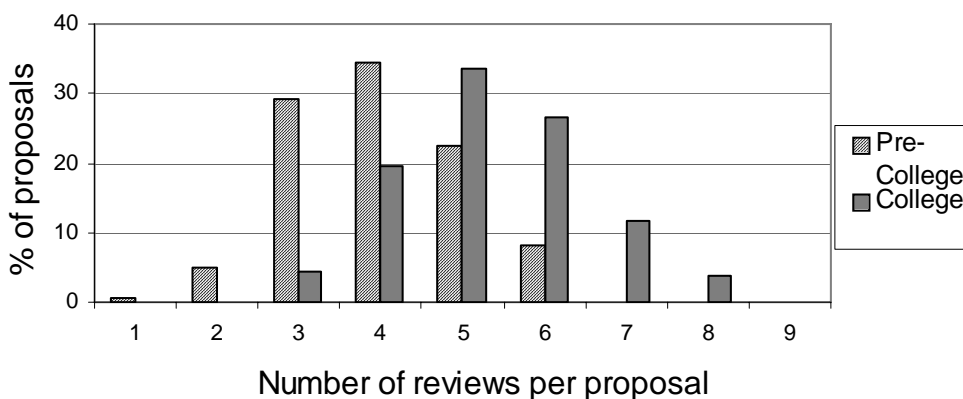
Table 9 compares countries of external reviewers approached for all responsive mode rounds in one year before the College (2001) with those for all schemes using external reviews in 2006 (noting that few Small Grant proposals are now sent to external review). The percentage of overseas reviewers approached for Standard and Small Grant schemes did not vary much between the two years, but was higher for Fellowships in 2006. Most overseas reviewers approached were in the USA, followed by other European countries in total.

In addition to proposals progressing past the sift receiving a larger number of reviews on average than before the College, there is also now a more consistent minimum level of peer review, with all proposals receiving at least 3 reviews. Prior to the College, 6% of Standard and 35% of New Investigator proposals were reviewed by two or fewer referees, and 4.7% of Small Grant proposals received only 1 review. Figure 5 illustrates the difference in mean numbers of reviews obtained for Standard Grant proposals pre-College (2000-2002) and since the College started (2003-2006).

Table 9: Percentage of reviews sought from different countries for 2001 and 2006 responsive mode schemes (excludes College reviewers).

	Standard Grants		Small Grants		Postdoctoral Fellowships		Advanced Fellowships	
	2001	2006	2001	2006	2001	2006	2001	2006
UK	37.9	33.7	41.4	43.9	47.9	32.3	36.4	30.5
USA	31.5	33.9	29.4	34.2	32.7	35.0	34.5	41.7
Europe (non-UK)	19.6	19.5	19.6	14.6	10.9	23.4	17.3	16.7
Australia & NZ	4.3	5.2	3.8	2.4	4.9	4.4	2.7	2.8
Canada	4.5	5.6	4.5	2.4	3.6	4.0	9.1	6.9
Other	2.2	2.1	1.3	2.4	0	0.9	0	1.4

Figure 5: Total Number of Reviews (College and External) for Standard Grant Proposals Proceeding Past the sift



The overall reviewer response rate has increased, because College members respond 98% of the time. However, the response of external reviewers has decreased from 60% in 2003 to 51% in 2007. Other councils experience a lower College response rate than NERC, and EPSRC and MRC have also seen a fall in external reviewer response rates

over the past 3 years (Table 10). Since introducing its College in 2005, AHRC has had an overall response rate of 64% from its College members, 52% from non-members. STFC's response rate has been quite consistent at around 80% for the past 6 years, but fell to 70% in 2007.

Table 10: Reviewer response rates: EPSRC and MRC.

		2005/06	2007/08
EPSRC	College	74%	62%
	All reviewers	70%	59%
MRC	College	70%	49%
	All Reviewers	52%	43%

Usage of College members

College members agree to review up to 15 proposals per year, although this maximum was exceeded in 2004/05. For the last two years of complete data (2005/06 and 2006/07), the modal number of reviews was 8, with a mean of 6.9 and 7.3 (Table 11 and Figure 6). A small percentage of College members have reviewed no proposals in any particular year. This may result in them being asked to leave the College because their area of expertise is not needed. Around 25% have undertaken 4 reviews or fewer per year during 2005/06 and 2006/07, but a similar percentage have provided 10 or more. Note that from 2005/06, Small and New Investigator proposal reviews have been counted as 'half' reviews (considered to take less time to review) and that in Figure 6, data have been rounded up to the nearest whole review. Data for 2003/04 are not available.

College members also commit to attending up to 5 meetings a year. However, 80-90% of members attend two or fewer per year (mean varies from 1 to 1.5), with the majority being on one or no panels (Figure 7). Between 10 and 19% of members have been on 3 or more panels in any one year, with 2-5% included in 5 or more.

Table 11: Usage of College members

	2004/05	2005/06	2006/07
Mean number of reviews	12	6.9	7.3
Mean number of meetings	1.5	1.3	1.0

Figure 6: Number of Reviews Undertaken by College Members

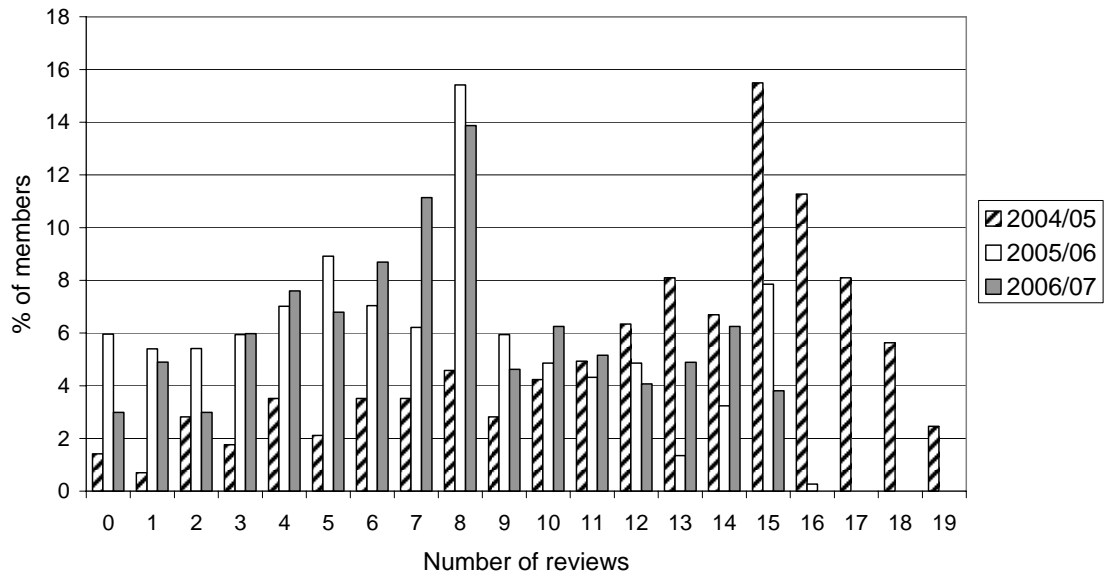
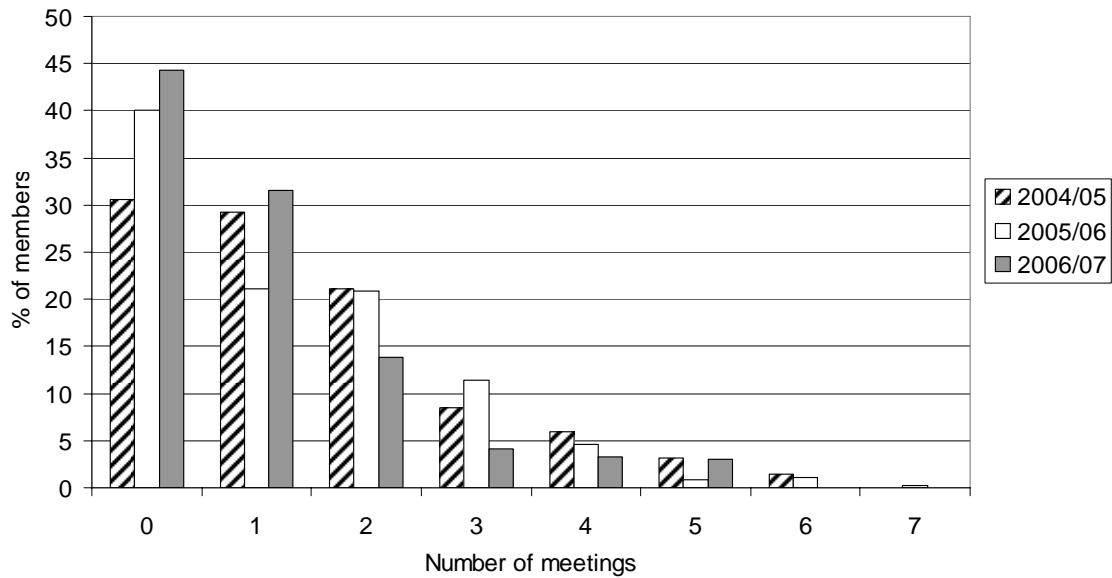


Figure 7: Number of Panel Meetings Attended by College Members



The questionnaire asked members whether they found the contractual workload appropriate: the majority (79%) did, with only 5% prepared to do more and 16% feeling that the workload is too high.

Discussion about level of peer review

Evidence was gathered to determine whether the College is fulfilling its original objectives of reducing the burden of peer review on the external community (and so improving reviewer response rates), and ensuring a consistent level of peer review for all proposals.

The results show that use of the College has reduced the burden on the external peer review community (excluding College members), because Standard Grant proposals undergo a sift, and most Small and New Investigator Grant proposals are reviewed solely by the College. For most schemes, the proportion of non-UK reviewers has also increased. However, when College members are included, Standard, Small and New Investigator Grant proposals now receive a slightly higher overall mean number of reviews than before the College. So whether or not the College is considered to have reduced the peer review burden on the community depends on how ‘community’ is defined.

The near to 100% response rate of College reviewers means that overall reviewer response rates have increased, but the response rate of external reviewers has decreased slightly. Data from other research councils suggest that this is a general trend, but feedback also suggests that some external reviewers are now less keen to do reviews because unlike College members, they are not paid.

Since introduction of the College, proposals that advance beyond the sift stage receive a higher average number of reviews and there is a more consistent minimum level of peer review. Moreover because College members undertake multiple reviews every year and receive training, there should be a more consistent level of review and use of grades. So it can be concluded that the College has been successful in providing a more consistent approach to peer review for all proposals.

It is clear that the reviewing workload is not evenly spread over the College membership. It is therefore proposed in Recommendation 5.1 that there should be more parity of workload between members, although this must not be to the detriment of the review process.

Quality of College Reviews

College members’ expertise levels in carrying out reviews

The percentages of high, medium and low expertise⁷ College reviews for each responsive mode scheme since the College started are listed in Appendix 2 (Table A1). There are only small differences between rounds and the overall mean percentages of high and medium expertise reviews are both around 42%, so overall, over 84% of reviews are carried out by College members with a good level of expertise in the field.

It was found that on average, professors were more likely than other College reviewers to state that they had high expertise and ‘others’ (usually affiliate members) that they had medium expertise (Table 12).

Table 12: Expertise levels stated by College reviewers with different titles.

	Professors	Drs	Others	Mean
% high expertise	42.6	35.1	20.0	32.6
% medium expertise	42.3	47.3	60.9	50.2
% low expertise	11.7	14.5	9.8	12.0
% unknown or no review	3.4	3.1	9.3	5.3
Total	100.0	100.0	100.0	100.0

Data comparing expertise levels stated for reviews (including whether reviews were for the whole or part of proposals) against grade awarded by College reviewers were also collated for all responsive schemes with a 2006/07 closing date (Appendix 2, Table A2). For each of these rounds, over 90% of reviewers assessed the

⁷ Expertise levels are currently defined as: high – areas on which the member could confidently comment with a high level of expertise, e.g. those in which they work personally and are considered an expert; medium – areas on which the member is sufficiently knowledgeable to provide an informed opinion, e.g. an area their research group works in, or those related to their own field where they would be aware of recent developments; low - areas more broadly related to the member’s own field in which they are able to provide a generalist opinion only.

whole application (around 93-94% for the Standard Grant rounds, over 97% for the Small and New Investigator rounds). These data exclude declined reviews to remove ‘unknown’ grades.

All expertise data come from College members’ own statements of their level of expertise in carrying out each review, which 76% of College members said they find it easy to decide on, with only 12% finding it difficult. Lower expertise reviews are sought when College members with more appropriate expertise are not available. Therefore availability of College members was examined for two College years (Table 13).

Table 13: Response of College members to availability request emails

Round	Jul 05	Sep 05	Nov 05	Dec 05	Feb 06	Jul 06	Sep 06	Nov 06	Dec 06	Feb 07	May 07
% no response	6	5	1	5	2	6	6	2	2	7	53
% unavailable	21	7	13	12	26	20	6	8	8	7	8

The table shows that up to a quarter of members may be unavailable to do reviews for a particular round, with lowest availability usually for the July Standard Grants round, when reviewing clashes with summer holidays and fieldwork seasons. Normally less than 7% of members do not respond to say whether or not they are available, although the percentage was much higher for the May 07 Knowledge Transfer Grants round.

For the July and December 2006 Standard Grants rounds, 7 and 14% of reviews were received after the requested date and reminder e-mails (excluding those with agreed extensions).

Analysis of July 2007 Standard Grant round reviews

A subjective comparison of both College and external reviews for ~20% of proposals considered by each of the 5 panels yielded the results summarised in Table 14. These data should not be over-interpreted, because they are based on one person’s subjective view and are for only a limited set of comments covering one grants round.

Table 14: Results of analysis of College and external reviews for July 2007 Standard Grant proposals.

Panel	Referee type	Mean expertise level of reviewer (low=1, med=2, high=3)	Quality of comments in ‘strengths’ section (from unacceptable=1 to excellent =5)	Quality of comments in ‘weaknesses’ section (from unacceptable=1 to excellent =5)	Extent to which comments supported grade (from unacceptable=1 to excellent =5)	Mean score for all 7 categories (max. 35) *	Mean α grade
A	College	2.1	3.8	3.6	3.4	26.9	3.7
	External	2.7	3.3	3.5	3.2	26.0	3.7
C	College	2.3	4.0	4.1	3.5	28.5	3.6
	External	2.7	3.8	3.8	3.5	26.7	4.3
D	College	1.9	3.7	3.9	3.9	29.6	3.9
	External	2.6	3.8	3.9	3.7	25.5	3.8
E	College	2.3	4.1	4.3	3.7	28.7	3.8
	External	2.7	4.0	4.1	3.6	27.9	3.9
F	College	2.5	3.9	4.2	3.7	28.6	4.0
	External	2.4	4.1	3.9	3.4	25.9	4.0
Mean	College	2.2	3.9	4.0	3.6	28.5	3.8
	External	2.6	3.8	3.8	3.5	26.4	3.9

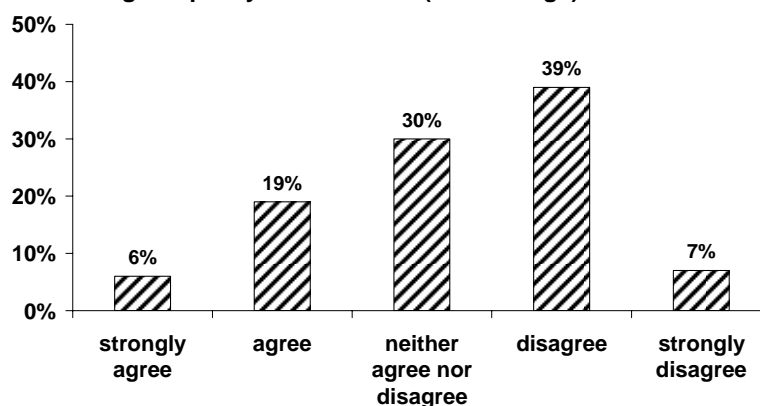
*Categories were: was correct form used? were all sections completed? quality of comments on strengths of proposal, quality of comments on weaknesses of proposal, whether or not any inappropriate comments were made, quality of other comments, and extent to which science (alpha) grade was supported by comments on strengths and weaknesses.

For 4 out of the 5 panels, on average the external referees rated their expertise as higher than College members. It should be noted that some reviewers state lower expertise than they appear to have (e.g. reviewers nominated by the applicant do not always state high expertise). In the majority of cases, College members scored very slightly higher than external reviewers for quality of comments and extent to which their comments supported the grade given. The overall score for College reviewers was also a little higher than that of external reviewers. There was little difference between the scores for different panels. The mean α grade awarded by each referee type was very similar (3.8 versus 3.9). However, there was more variation for Panel C (which broadly covered biogeochemical cycles, pollution and ecotoxicology), with external reviewers giving higher scores.

College consultation responses on quality of reviews

Respondents to the College consultation who had attended at least one panel meeting were asked whether, in their opinion, reviews from College members were generally of higher quality than those from external reviewers. Only a quarter thought that they were, with nearly half disagreeing (Figure 8). While some members felt that College reviews provided consistency, there was a view that they often lacked the depth of external reviews, and one respondent commented on the lack of international perspective. Another felt that: "In respect of grading I would say the PRC members are more consistent but in terms of comments the external advice is usually better." NERC staff who read reviews commented that College members' reviews provide a useful benchmark and that members are more reliable than other reviewers.

Figure 8: In general, reviews from College members are higher quality than external (non-College) reviews.

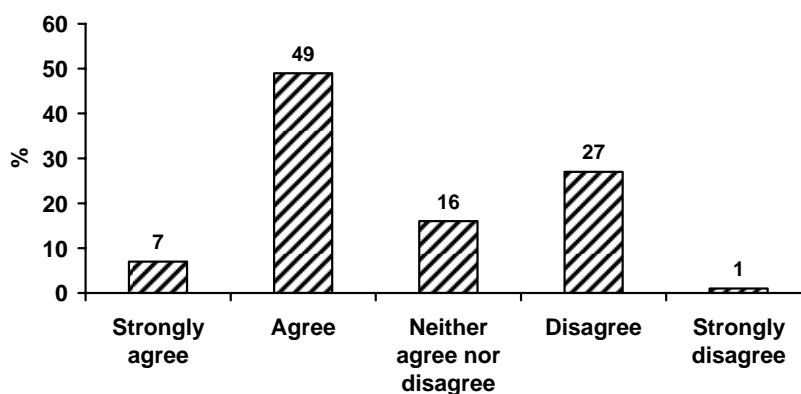


The majority of College respondents (92%) had attended a training event (which aims to promote high standards of review writing and consistent use of grading) and all members are provided with a New Member's Information pack and guidance on the College website. Consultation responses suggested that most members (86%) find this adequate, with only 4% disagreeing, and the majority of feedback after the events has been very positive, for example: "I have served on other panels; I wished they have invested time and effort for training. Very good opportunity!"; and "Fantastic training event...a genuine insight into the processes and transparency".

Perhaps as a result of this, more than half are always confident in providing initial reviews of proposals (Figure 9); the percentage may have been higher had there been an option to state whether they were confident most of the time.

Around two thirds of College members felt that the grading system for proposals and its definitions are easy to understand (Figure 10). Some commented on the discrepancy between the initial review stage (i.e. options of α 3.5, 4 or 4.5) and panel stage (options of α 3, α 4 low, medium and high).

Figure 9: I am always confident in providing initial reviews of proposals



The majority of College members agreed that the College provides high quality peer review of responsive mode proposals (Figure 11). The main reasons stated by those disagreeing were:

- a lack of trust in reviewers' expertise and feeling that reviews from stated non-experts are of limited value;
- disquiet that the judgements of experts can be overruled by panels; and
- a perception that the community may be losing faith in the College because of inconsistency of panel membership, with some weak members and not enough panel members who commit to fully reading all proposals.

About half of College respondents thought that the proposal assessment process identifies the best science to fund (Figure 12). There were 10 comments about the need to increase emphasis on adventurous, higher risk and exciting proposals, rather than safer, lower risk science proposals written by experienced investigators. Several people were concerned about the balance of expertise and experience on panels (with too many inexperienced members); others that strong personal opinions by some panel members affected the ultimate grade. There were suggestions that reviewers should be sent the comments of other reviewers and panels to learn from, that the number of foreign reviewers should be increased and that NERC should anonymise proposals to all except the panel chair.

Figure 10: I do not find NERC's grading system for proposals and its definitions easy to understand

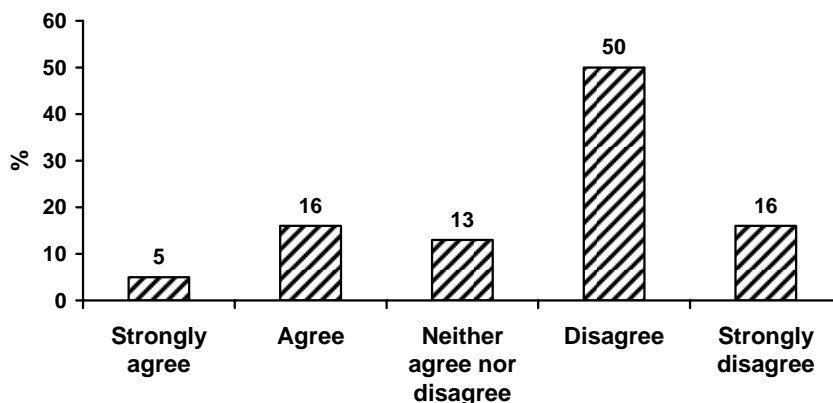


Figure 11: I trust the College overall to provide high quality peer review of responsive mode proposals

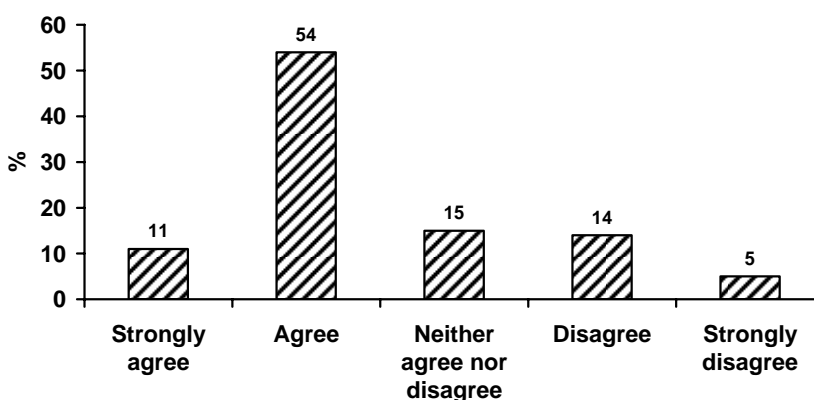
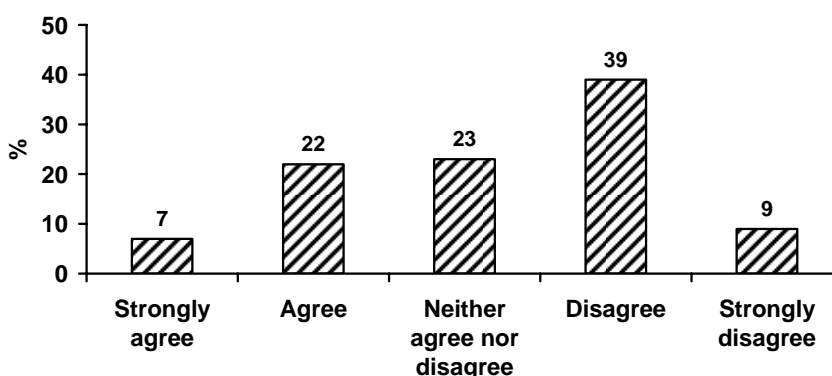


Figure 12: I do not believe that NERC's proposal assessment process identifies the best science to fund



Open consultation responses on quality of reviews

Fewer of those responding to the open consultation (39%) have confidence in the quality of peer review (Figure 13) and there were few positive free text comments in this area. One respondent believed that "Overall, NERC's assessment procedure does identify the majority of the best proposals for funding. However, the vagaries of individual referees/ moderating panel members can ensure that a certain proportion of excellent proposals are not treated fairly". Others perceived that the strongest proposals were not always those that got through the sift, or were funded, and one raised the issue of unfunded α 4-graded proposals being resubmitted and receiving a lower grade. A common theme was concern about thoroughness, quality and consistency of College reviewers' comments, lack of consistency of grading and lack of expertise of the College or panels.

Almost half of the respondents did not believe that NERC identifies the best science to fund (Figure 14), with 27% believing that it does. There were similar underlying reasons, including:

- concerns over low quality reviews (e.g. that one poor review could pull a proposal down in the ranking);
- low number of panel members who seemed to read proposals outside their direct interest (compared to pre-College);
- the power of introducers to influence the fate of a proposal (e.g. may champion it or be non-expert);
- ability for a panel to overrule the opinion of expert reviewers; and
- inconsistency in decision-making e.g. “grants/ fellowships are turned down for reasons that apply at least as much to successful grants”.

71% of respondents believe that some proposals receive better quality reviews than others. Whilst a few recognised that using the College may ensure more overall consistency, concerns centred round the issue of low expertise reviews,

which some blamed on inadequate subject coverage of the membership. It was felt that this resulted in "light touch" reviews and reviewers/ introducers misunderstanding some proposals, so giving poor quality comments. This means that feedback is not always helpful (and occasionally incorrect) and there may be inadequate justifications for decisions, with a few respondents suspecting that proposals that members understand, or from applicants that are well-known to them, have more chance of success.

NERC staff consultation on quality of review

Staff who interact with the College and peer review system have a higher degree of confidence in the College than respondents to the other consultations, believing that overall the College provides a good quality of review and members are generally reliable. However, senior staff have some concerns that the quality of membership has decreased with time and feel that there are areas for improvement. The SPOs and grants administrative staff noted that although training has resulted in better quality reviews, some members still do not provide reviews of sufficient quality and that more should be done to manage this. It was felt that having agreed to the terms and conditions of membership, they should take responsibility for providing high quality reviews.

NERC SPOs are responsible for allocating reviewers to proposals, which they do mainly using keywords and expertise. Their suggestions for improvement included getting more consistent descriptions of members' expertise, perhaps using examples or a template. They commented that it is usually difficult to find a third reviewer with sufficient expertise and that some proposals will always be difficult to find appropriate reviewers for, suggesting that there could be an option to use external or other councils' reviewers. Lack of availability of members can also be a problem, particularly in the summer. Allocating reviewers would be easier if there was more consistency in allocation of SPOs to panels (as they would know their areas of science better), but they also enjoy the variety in their jobs.

Figure 13: I have confidence in the College overall to provide high quality peer review of responsive mode proposals.

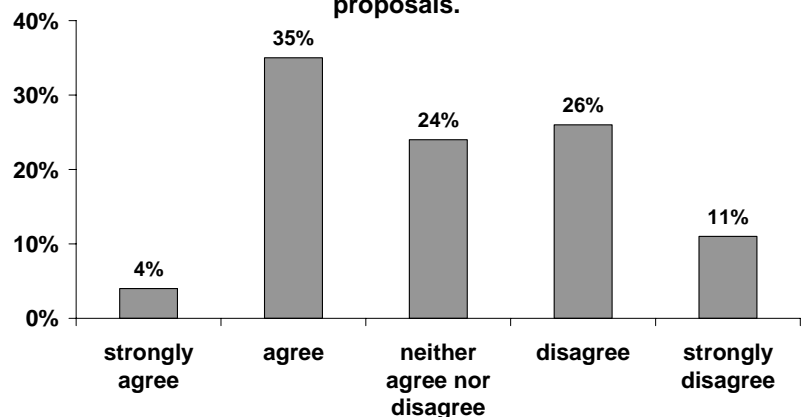
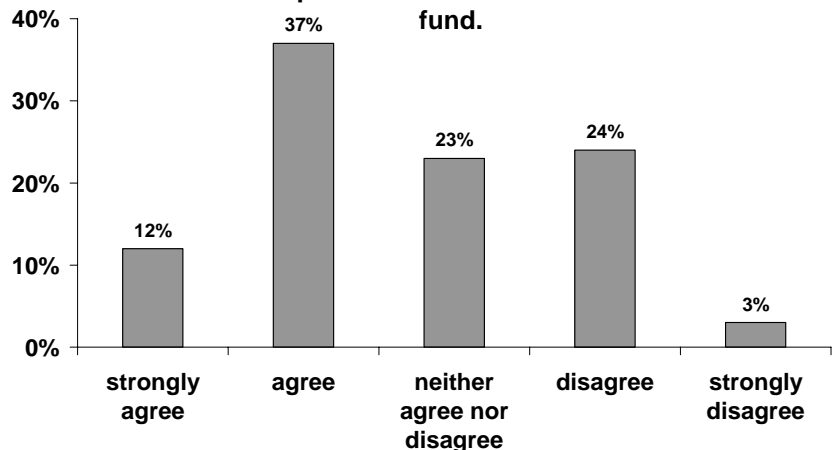


Figure 14: I do not believe NERC's proposal assessment process identifies the best science to fund.



Some staff shared College members' concerns about the different grades used at the initial review and panel meeting stages and had also been asked how NERC defined "top 25%". They therefore felt that the grading criteria are in need of amendment, but recognised that this depends on plans for cross-council harmonisation. More guidance was also suggested for the Fellowship grading scheme.

Discussion about quality of peer review

The Evaluation's objectives included assessing whether the College and associated review process are delivering the quality of peer review necessary to identify the best science; determining whether the College has the confidence of the environmental sciences community; and assessing whether the College is fulfilling the original aim of ensuring a consistent level of peer review for all proposals and equitable assessment across all science areas.

A high proportion of College reviews are carried out by members declaring a good level of expertise in the field and almost all assess the whole proposal. More experienced members (i.e. professors) are more likely to rate their expertise as high. Lower expertise reviewers sometimes have to be used because up to a quarter of members are typically unavailable to carry out reviews per grants round and in addition, some members cannot be approached because they have carried out their maximum quota of reviews before the end of the College year. However, it is NERC's policy to put any proposal that has not been reviewed by College members with adequate levels of expertise through the sift and so to external review.

Nearly all College members attend a training event and receive guidance, which most find adequate. Over half always feel confident in providing initial reviews and the majority find NERC's grading system easy to understand. Most members and NERC staff trust the College to provide high quality reviews, but only 39% of external respondents share this confidence. Moreover, only half of College and fewer external respondents believe that NERC identifies the best science to fund. In particular, there is a perception that risky or adventurous proposals are less likely to be funded, which was also a finding of NERC's Blue Skies Review. This suggests that NERC must continue to stress to applicants, College members and external reviewers its desire to fund adventurous and innovative research.

Although external respondents had less positive views than College members, they had similar concerns. These centred round the value of low expertise reviews and lack of consistency of comments and grading; some members are thought to provide low quality reviews, which lack adequate justification for decisions. SPOs estimate that ~10% of College reviews are not of acceptable quality. Some of this may result from members having too many competing demands on their time, so they are unable to carry out reviews as thoroughly as they would like to. It should also be remembered that some of this criticism is likely to apply equally to any peer review system, because peer review relies on individual opinion and is open to human error. Another particular concern was that lack of funding means that success can be seen as a lottery.

Compared to College reviewers, external reviewers on average state higher expertise in completing reviews. This is to be expected, because they are selected from a larger pool of individuals. However, analysis of comments suggested that College reviews, the degree to which they support the grade given, and the completeness of review forms, are of slightly higher quality than that of external reviews. A quarter of members agreed that the College provides reviews of higher quality than external reviewers, with some feeling they are more consistent but lack depth. Although College members receive training, external reviewers are giving a more specialist viewpoint, so are likely to be able to give more comprehensive comments, and they are only asked to review one proposal at a time.

In answer to the question of whether the College and associated review processes are delivering the quality of peer review necessary to identify the best science, the evidence suggests that in general the College provides a good level of review, although not all members deliver high quality comments and opinions are divided over whether or not the best science is always identified. Furthermore, while College members and NERC staff have a reasonably high level of confidence in the College's ability to provide high quality reviews, over half of the external community does not share this confidence. It is therefore recommended that NERC takes steps to increase the level of confidence in its peer review process (Recommendation 3).

NERC needs to commit more resources to managing the performance of members (Recommendation 4.2). The proportion of low expertise reviews should be further reduced (Recommendation 3.1), by asking members for better expertise descriptions when necessary to aid selection of the most appropriate reviewers, and by allowing the option of using external or other council reviewers when insufficient expertise in a particular field is available within the College. However, it should be noted that low expertise reviews can be insightful and less influenced by the applicant's track record.

It may be helpful to consider whether NERC's grant closing dates can be changed in future, so that review periods fall at less busy times and more members are available. Other suggestions to improve overall quality of review include the use of more overseas referees (although NERC currently seeks the most suitable external reviewers, regardless of location) and the anonymisation of proposals to reviewers so there is a more level playing field. Current NERC guidance asks reviewers and panels to assess the proposal, rather than the applicant, so poor proposals from experienced scientists are not funded. Full anonymisation of proposals could be problematic in that it would not allow reviewers to gauge the suitability of the research group to carry out the proposed work and publish the results in high quality journals, nor to fully assess the resources requested. Furthermore in some fields it may be more obvious than others who the applicants are, so the field would never be truly level.

Sift process

Since introducing the sift, between 33 and 50% of proposals have been sifted out per round (data in Appendix 2, Table A3). If the sift is successful in selecting the highest quality proposals, this should be reflected by the grades given at the next (i.e. external) stage of review. The distribution of grades given by reviewers for one year before the College was therefore compared with that for external reviewers during one year after introduction of the College and the sift process.

It can be seen from Figures 15 and 16 that the proportion of $\alpha 4$ and 5 grades allocated to Standard and Small Grant proposals has increased, and the proportion of lower grades decreased, as a result of sifting; however, a larger change might have been predicted for Standard Grants, given that on average the top 61% of proposals go through the sift. The 2006/07 data for Small Grants show a larger increase in proportion of high grades, but are based on low numbers of external reviewers (41). Fellowship data are not

Figure 15: Comparison of External Reviewer Grades for Standard Grants in 2001/02 and 2006/07

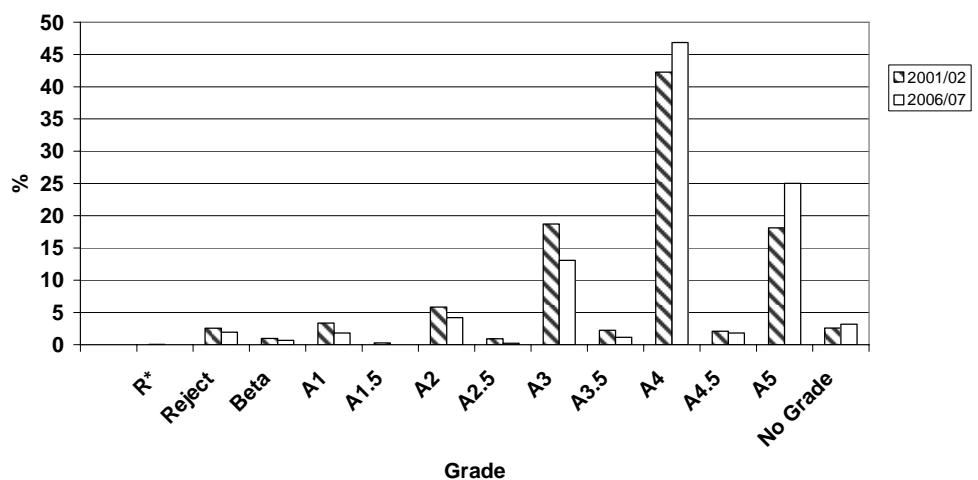
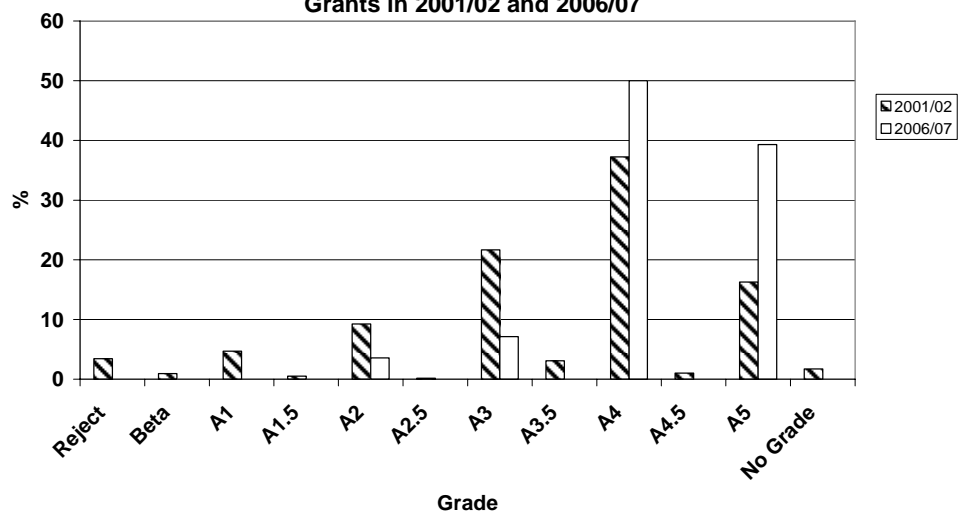


Figure 16: Comparison of External Reviewer Grades for Small Grants in 2001/02 and 2006/07



comparable, because proposals were short-listed even before the College was introduced (although in the past this was by correspondence and it is now at a meeting).

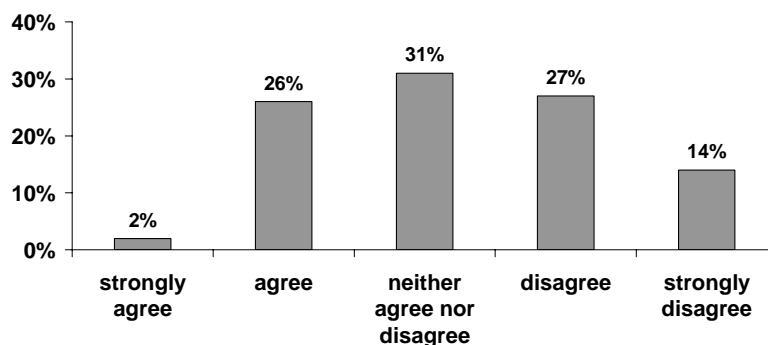
Data for all schemes illustrate that $\alpha 4$ was the most common grade given by external reviewers, even before introduction of the sift. There is a marked difference between these distributions and those that would be expected from the NERC definitions of grades (e.g. $\alpha 4$ grade should be used for top 25% of proposals).

As a check on the sift process, during each Standard Grants round one proposal that would otherwise have been rejected is put through to each of the panel meetings. Those chosen are right at the sift borderline rather than those allocated very low grades. Since the College started in 2003, three of these “blind trial” proposals have been successful.

The College consultation did not explicitly ask about the sift process, but the general comments included the suggestions that more international and/ or external referees should be used and that proposals should be held over if they have insufficient reviews. A few had concerns about any proposals being rejected before they have been out to external review. However, NERC staff feel that the sift works well, with the high response rate from College members allowing reliable identification of the top proposals for panels to concentrate their efforts on.

In contrast, open consultation results (Figure 17) showed that only 28% of the community have confidence in the sift process to identify the highest quality proposals. Previous feedback from the community has also included criticism of the process. It is clear both from explicit requests and misunderstandings that much greater transparency is needed in the sift criteria, how these are weighted, the ‘checks and balances’ employed and the process in general.

Figure 17: I have confidence in the sift process to identify the highest quality proposals to proceed to the next stage of review.



There were a few open consultation comments that the sift was a good idea and generally works well, striking a “reasonable balance in terms of fairness and efficiency”, with some recognising that it has to be tough because funding is limited. However, many others would prefer proposals to go to full review without sifting, because they feel the College lacks the expertise, both in terms of coverage of sub-disciplines and the academic credibility of the members. Some go as far as to consider the process to be “a disgrace”, “nonsense” or “flawed”. There were also a few requests for the initial review to consider outline proposals only, because they are less work for unsuccessful applicants. The main issues raised with the sift were:

- Inconsistent initial reviews, so rejection may be based on reviews of inadequate quality and not identify the best science to go through. As one respondent explained: “As a scientist (*sic*) it is acceptable to have a set of peer reviews find mistakes and flaws and not grade a proposal high enough for funding but to have it rejected by a self-elected member of a College with reasons that are essentially threadbare at the very least is not good.” Some would like the opportunity to challenge College reviews and an appeals procedure, although one thought that “Rejections should not result in a two-discussion (*sic*) of why it didn't make the grade and NERC should not spend effort ensuring individuals are placated in this way. Bottom line is that it was not good enough...”
- Use of College reviewers who are non-experts and have inappropriate expertise, which respondents attributed to lack of necessary expertise on the College (or even in the UK). Some College members are perceived as being too junior and lacking experience of what makes a good proposal. Some therefore do not consider initial review stage to be true peer review, as proposals are not thoroughly assessed. For example: “Some College members appear to think they have expertise beyond what they might realistically be expected to have. They are encouraged to comment on proposals even if they are not FULLY up to speed on the subject area... this leads to feedback that is grossly misleading for those

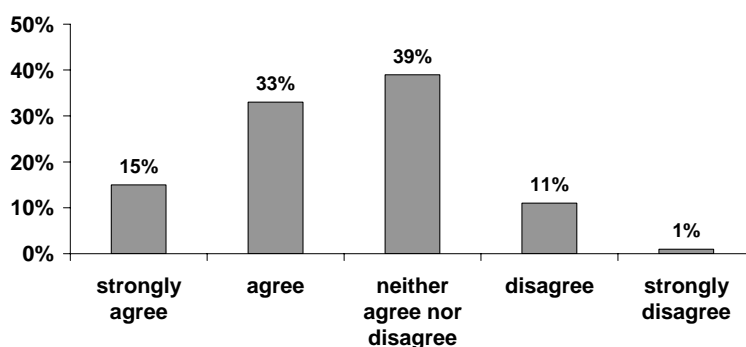
undertaking the sift... So grants that are very specific, but outside the real expertise of the college members, or are very broad such that college members understand only PART of the application may be incorrectly sifted out.” However, a counter view expressed was: “There is widespread (mis)perception that College members are not able to assess all proposals adequately. I think this is wrong - senior academics are more than capable of assessing proposals that are not directly in their science area sufficient for Stage 1.”

- Some initial reviewers may be biased because all are in the UK and most have some kind of interest in the outcome. This is thought to be a particular issue in smaller fields with few representatives on the College, who thus have too much power over the first stage.
- Sift is thought to penalise some types of science that NERC seeks to encourage, including risky, exploratory, innovative and interdisciplinary science. There is a perception that proposals have to be written differently to appeal to generalists, but also have to contain enough details of the science for expert reviewers at the next stage.
- NERC staff should not be involved in the sift because they are not scientifically qualified to make such decisions and there should be some academic involvement (e.g. panel chairs) in making the decisions and perhaps providing feedback to applicants.
- Sift stage has lengthened the process and needs to be shorter [although those rejected at sift get a quicker decision] and is perceived to be only to reduce the workload of NERC staff.
- The aspiration to sift around 50% of proposals being “target-based rather than merit-based”, so appearing “somewhat arbitrary” and leading some College members to feel pressured to give lower grades.
- Treatment of resubmitted proposals: when unfunded α 4-graded proposals are resubmitted then rejected at sift stage, applicants feel system lacks credibility, objectivity, consistency and fairness, for example: “When a proposal is rejected at the sift stage, and the applicant then resubmits it having taken all College members' recommendations into account, it is most frustrating for the revised application to then be rejected (either at sift or full panel stage) for precisely the new sections that the original College members recommended”.

One respondent encapsulated many of these concerns: “Doing the sifting by mail is extremely risky to anyone who has ever participated in a grants meeting, because it is easy for people to get the wrong end of the stick, and this emerges at a meeting. The method of sifting lays itself open to misunderstanding by reviewers, which then is not caught in the office...I am particularly worried about cross-disciplinary research and the riskiest proposals, which will tend to be discounted, and also ones where there is little expertise in the office, which can easily be assigned to the wrong reviewers. I also worry that the current system does not allow well enough for the rogue reviewer at the grants panel stage, because when there were standing panels the committee could use the referee comments while recognising that certain referees were always hard at grading. When there is no such shared memory, harsh grading cannot be discounted so easily, nor over-easy grading corrected so easily.”

Given these comments, it is unsurprising that 48% of respondents to the open consultation felt that when a proposal is rejected at the sift stage, College members’ reviews do not provide adequate reasons for the decision (Figure 18). There was widespread dissatisfaction about the variability in quality of feedback. Applicants found it particularly difficult to interpret contradictory initial reviews and cited experiences of unhelpful, erroneous and extremely

Figure 18: When a proposal is rejected at the sift stage, College members’ reviews do not provide adequate reasons for this decision.



brief reviews, with some containing inappropriate and even aggressive comments. A number of respondents suggested that automatic feedback should be provided.

Some respondents attributed problems to the ability and effort of particular College members, rather than the process. There was an impression there are too many College members who do not do the job well enough and that they should be given feedback and if they do not improve, asked to leave the College. It was also stressed that “Reviewers should adhere to good manners, which includes making the effort to write in whole sentences and using a friendly, business-like tone and avoiding sarcasm.”

Discussion about the sift process

The sift removes an average of 39% of proposals. Since the overall success rate is ~20%, the panel has to select around 1 in 3 proposals for funding. Data showing that the proportion of proposals given high grades by external reviewers has increased since introduction of the College and that only three borderline ‘blind trial’ proposals have been successful since 2003, suggest that the sift does identify the highest quality proposals to proceed to the next stage. The high response rate from College reviewers also provides greater reliability. In addition to reducing the burden on external reviewers, advantages of the sift are shorter moderating panel meetings, less work for panel members and, given the limits on available funding, a focussed effort on the best proposals. Moreover, applicants who are unsuccessful at the sift stage get a quicker decision. However, NERC needs to address the fact that many of those responding to the open consultation said that they do not have confidence in the sift process to identify the highest quality proposals, and to challenge the belief held by some applicants that proposals rejected at the sift have not been ‘properly’ peer reviewed.

The majority of concerns over sift decisions relate to worries that decisions are based on College reviews that are of inconsistent quality and from those with varying levels of expertise, which are addressed by Recommendations 3.1 and 3.2. Some also believe that the sift is affected by conflicts of interest and bias. This is difficult to prove or disprove (see below).

Applicants dislike not having an opportunity to respond to pre-sift reviews or appeal against decisions, with almost half of respondents unhappy with the reasons given for rejection at the sift stage. However, it would not be possible to include these in the process without diverting resources away from grant funding to employ more staff in processing grants. It is hoped that satisfaction levels can be raised by increasing the quality and consistency of College reviews.

The belief held by some that the sift was introduced only to reduce the workload of NERC staff is a misconception, because it has added an additional stage to the process, thus increasing the workload; the aim was rather to reduce the burden on external reviewers. Additionally, modelling by the RCUK Peer Review Project Board suggested that if all research councils achieved a sift rate of 40%, the result would be a £5.3 million potential cash equivalent saving. Such savings on processing costs maximise the amount of funding available for research.

The particular concerns that ‘risky’ and multidisciplinary proposals are less likely to make it to the next stage can be addressed by guidance to College reviewers and reiterating NERC’s desire to encourage these categories of proposals. Further consideration is needed about the treatment of resubmitted unfunded α -graded proposals: these may be unsuccessful at the sift stage, which applicants find particularly exasperating, and if they get through to the next stage they are not flagged up to panel members. However, this may also be a positive aspect of the system, because any individual referee’s opinion does not influence future decisions.

Greater transparency in the sift process should help to increase confidence levels and address misconceptions (Recommendation 4.1). Information should be available regarding the algorithm, the criteria on which the sift is based and the checks on the process. However, concerns will undoubtedly remain and some will never be comfortable with the concepts that a proportion of proposals will not reach external reviewers and that decisions are made within Swindon Office. NERC needs to ensure that decisions are made objectively and consistently, based on the best possible evidence, so that the process is as robust as it can be.

Moderating panel meetings

The College system involves far more people in panel meetings than the previous peer review committees. In their last year (2002/03), there were 14 members of each of the 5 committees, so 70 people took part in panel meetings. Since the introduction of the College, Standard Grant panels consist of between 10 and 17 members (mean of 14). Because panel membership changes for each round, a total of more than 200 individual College members participate in Standard, Small, New Investigator and Fellowship meetings each year. Small and New Investigator proposals are now also discussed at panel meetings (with up to 16 members on a panel), whereas prior to the College they were assessed by peer review committee members by correspondence, with the chairs deciding the final ranking. Fellowship proposals continue to be assessed at panel interviews, with around 6 College members on each panel. However since introduction of the College, a sub-set of the final panel also meets to shortlist applicants.

The grades allocated by the peer review committees in 2001/02 were compared with those awarded by panels since introduction of the College for all responsive mode schemes (Figure 19; additional data in Appendix 2,

Figure 19: Distribution of final grades

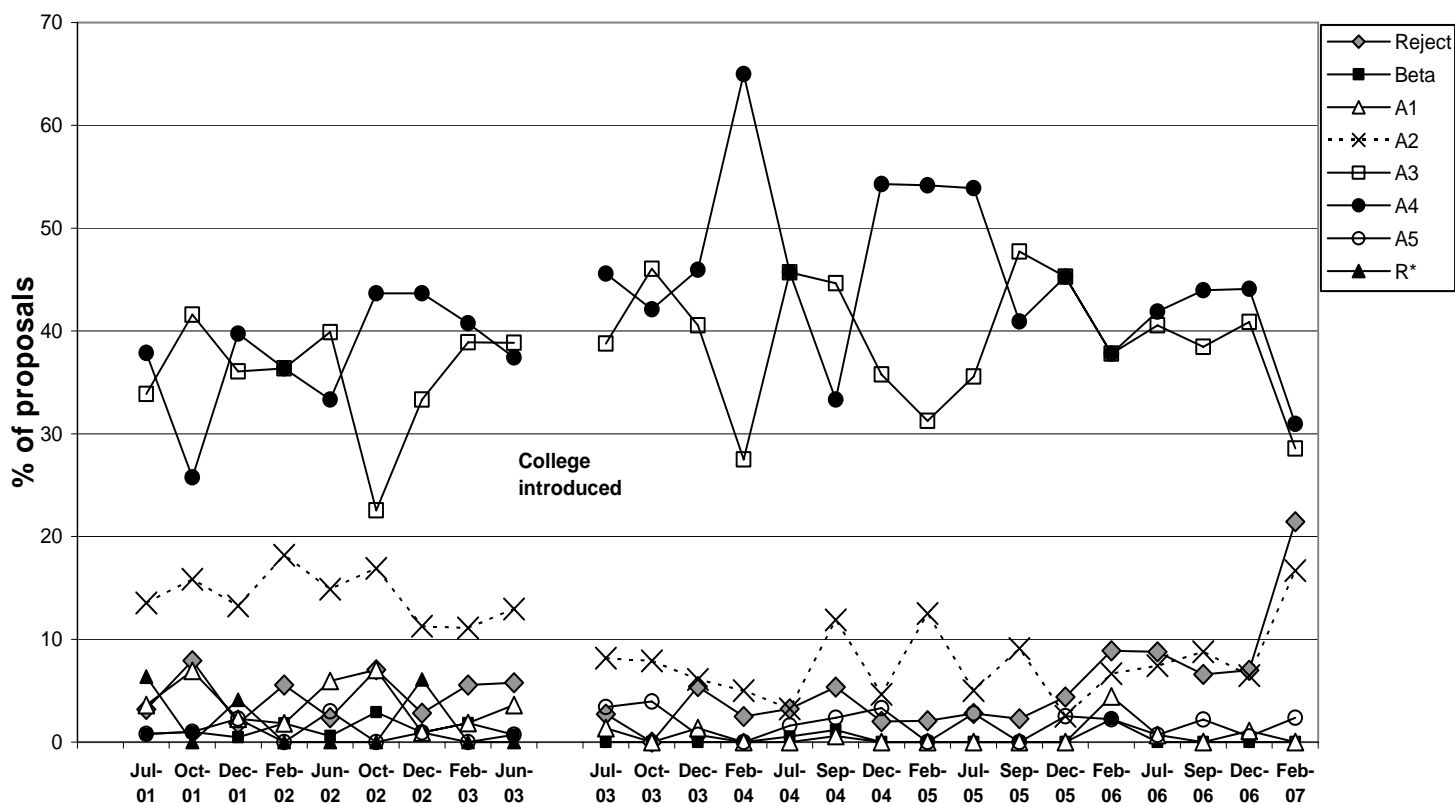
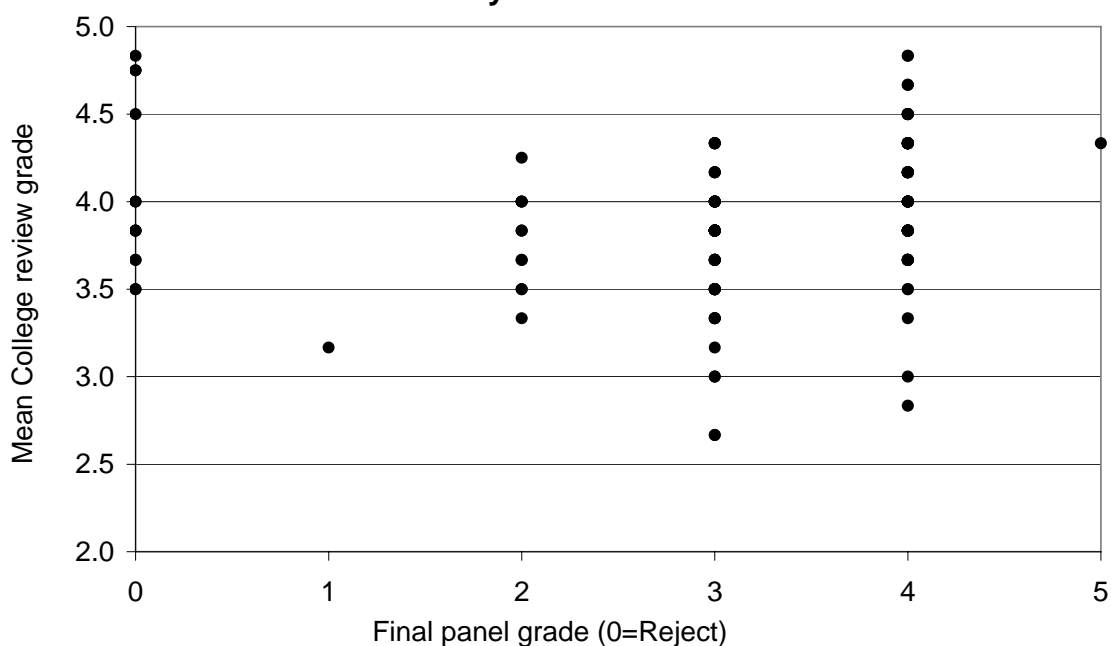


Table A3). Since proposals are now sifted, it is no surprise that there have been fewer lower-graded proposals and a higher proportion of α 4s since introduction of the College. A higher percentage of 'reject' grades has been awarded since the College started, coinciding with discontinuation of the option for panels to invite resubmissions (R* grade). Proposals graded 'reject' now include those that are potentially excellent, but flawed in the way that they are presented, e.g. insufficient detail of the methodology and/or work plan.

Comparison of College reviewers' and final grades

Figure 20 shows how the mean of the 3 grades allocated by the initial College reviewers compared to the final panel grade, for one Standard Grants round (where reject = 0, α 1 = 1 etc.; some circles represent multiple data points). Proposals graded reject had average College grades ranging from 3.5 to 4.8. The lowest average College grade for a proposal ultimately graded α 4 was 2.8. The proposal with the lowest mean College grade of 2.7 got a final grade of α 3. (It should be noted that proposals with low mean grades may go through the sift either because they have low expertise College reviews or a wide range of grades).

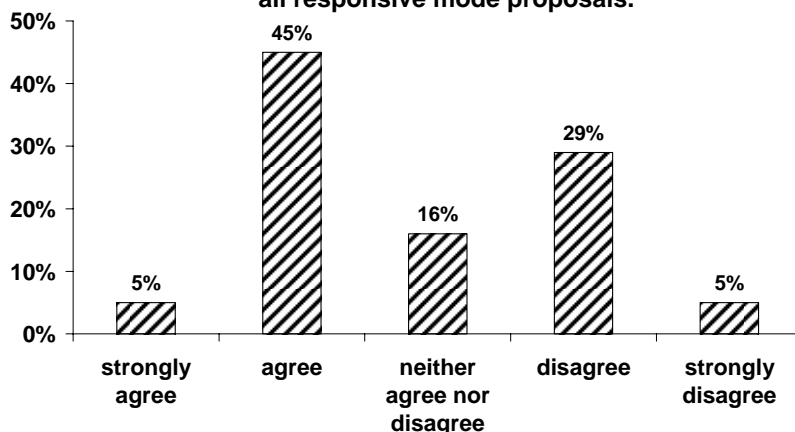
Figure 20: Mean College Review Grade Compared to Final Panel Grade for July 2006 Standard Grant Round



Results from consultation questions on panel meetings

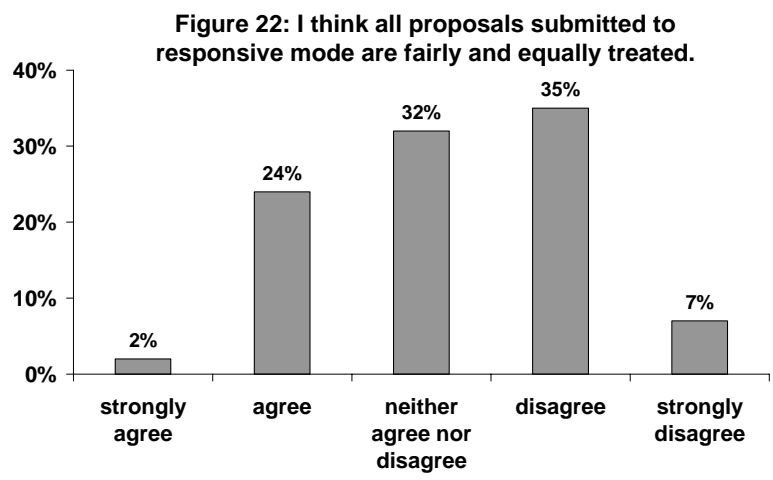
71% of College respondents had attended at least one panel meeting and so answered the relevant questions, with over a quarter having attended 4 or more. As Figure 21 shows, half agreed that there is fair and consistent peer review of all responsive mode proposals (although the percentage may have been higher had they been asked about ‘most’ proposals). The overall view was that the system is reasonably fair and consistent, while recognising that some inconsistencies are inevitable in any peer review system. Positive feedback has also been received from panel members after meetings, such as: “I thought the Panel process worked as openly and fairly as was possible” and “I enjoy the glaringly honest atmosphere in which the committee works, in which rational argument rather than personal authority seems to dominate...I am impressed by the frequent overlap or convergence of opinions within the review process.”

Figure 21: There is fair and consistent peer review of all responsive mode proposals.



However, concerns were raised relating to the relative input from individuals, because some panel members are more forceful than others and less experienced introducers may be tempted to change their grades based on others’ opinions. As already mentioned, it was felt that introducers have excessive power to determine a grade and often override those of external reviewers. Some NERC staff shared this concern that one panel member can sway a decision (although again noting that this is not specific to the College). Some College members find dealing with conflicting reviews difficult and others emphasised that consistency of decision-making is very dependent on the skills of the chair. Other comments included that there can be dilution of expertise when there are many proposals covering a wide remit, that having different members for each funding round limits the consistency of the system and collective memory and that “time constraints on the panel meetings lead to a desire to decide quickly”.

26% of open consultation respondents agreed that **all** proposals are fairly treated, with 42% disagreeing (Figure 22). Comments included: “Reviewers feel able to offer poorly justified and partisan reasons for rejecting proposals”, with another suggesting that College members might treat proposals they understand more favourably. A few criticised the lack of external reviews, with feedback prior to this Evaluation suggesting: “Whilst an inexperienced introducer can moderate expert reviews and an expert reviewer can manage inexperienced reviews, there is no way that an inexperienced introducer can (or should) properly grade a proposal with only inexperienced reviews for guidance. It would be better for the application to be held over to the next meeting, so that a more complete set of reviews can be obtained.” Others thought that *ad hoc* panels resulted in a lack of continuity and corporate memory, with some believing it was advantageous to know the panel make-up in advance of writing the proposal. Other suggestions included: greater transparency, such as providing reviewers’ grades; more consistency in application of assessment criteria by panels; more introducers, especially on interdisciplinary panels.



It was reiterated that applicants feel that panel members do not always take account of good external reviewers’ comments, instead stating their own negative opinions to which applicants cannot respond. There are fears that this means the best science is not always identified and this undermines confidence in the process. Informal feedback has also included concerns about the objectivity of those from competing groups/ departments, particularly in areas where the UK community is small, with some suspecting that reviewers do not always state conflicts of interest. There is also a perception that proposals are only funded if a panel member supports them. There were a few comments about lack of funding, although this is not a function of the College system e.g.: “My experience of moderating panels is a positive one. I believe that everyone tries to be as fair as possible. However, there still remain more genuinely excellent proposals than can be funded. Within those genuinely fundable applications one can spot the absolutely top ones (alpha 5s), but with the best will in the world those rated alpha 4 end up in a bit of a lottery.”

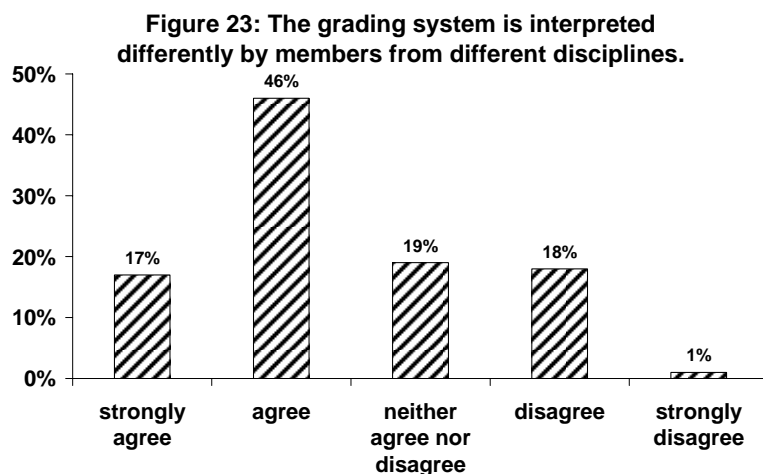
Are there differences between science areas?

Since the College system was introduced, the highest numbers of proposals received have continued to be in the terrestrial sciences area (Table 15). The number of freshwater sciences proposals has decreased and was previously similar to marine sciences. Although atmospheric sciences continue to account for the lowest proportion of proposals, they now have the highest success rate, while freshwater sciences have the lowest. It should be noted that proposals are classified by the applicants (and since 2003 this has not been validated by NERC) and that the data are based on the highest percentage classification, e.g. a proposal classified as 60% terrestrial and 40% freshwater would be counted as terrestrial sciences.

Table 15: Success rates by science area (pre-College data are mean of last two Standard Grant rounds pre- College)

Science area	Proposals received since College introduced	Grants awarded since College introduced	Success rate % since College introduced	Success rate % pre-College
Atmospheric	573	133	23	29
Earth	1130	252	22	24
Freshwater	722	100	14	28
Marine	1045	186	18	30
Terrestrial	1531	299	20	26
Overall	5001	970	19	27

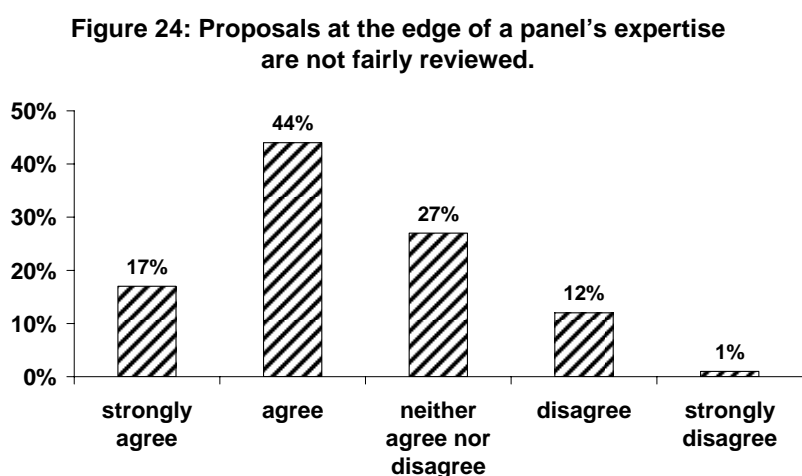
The consultation revealed that 63% of College members consider there to be inconsistencies in grading across different disciplines (Figure 23). However, free text comments recognised that these inconsistencies are not easily identified or resolved. There were several comments along the lines of: “Some disciplines are stricter than others, and there is some room for advocacy to go a little too far in some disciplines.” It was felt that those from different science areas do behave differently in the assessment process, and suggestions that NERC publishes metrics on numbers of proposals received and College members in different disciplines (with the aim of encouraging membership in under-represented areas). There is also a perception that the College structure has discriminated against some of the smaller science areas. Others consider that there is a bias against certain types of work, either by NERC or reviewers, but a bias towards “trendy topics”. Some consider the system to be too risk averse and fear that only hypothesis-driven proposals are supported, which “Ignores the huge benefits that can be gained from some well formulated exploratory science. It would seem logical to support diverse models of investigation to maximize the opportunities for new and unexpected findings”.



Some of these concerns were shared by NERC staff, who felt there is a tendency for some communities/panels to grade harder than others. Although not specific to the College, this can be more obvious when panels include a mix of subject areas. NERC SIMs work in science areas and noted concerns from particular communities, e.g. marine science proposals now tend to be divided between different panels, and a perception that other areas benefited more from the current system. Suggestions for dealing with this tension between communities with more collaborative versus competitive cultures included:

- good chairs;
- more training;
- continuing use of *ad hoc* panel system;
- continuing practice of some NERC staff attending all meetings to promote rigid adherence to grade definitions; and
- inclusion of independent members.

College members were also concerned that proposals at the edge of a panel’s expertise are not fairly reviewed (Figure 24). There were few free text comments explicitly relating to this, but one suggested that as a result of a proposal being on the edge of a panel’s remit “insufficient expertise is provided to assess proposals either from the reviewers or from the panel”. A few respondents felt that this problem extended to the boundaries of NERC’s remit, particularly with BBSRC.



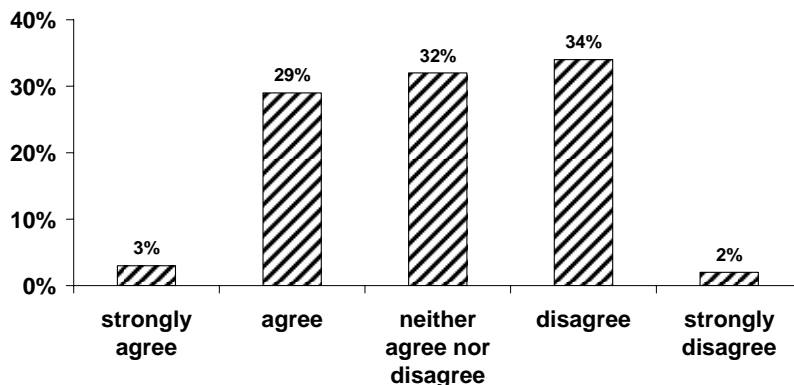
NERC staff also perceived there to be problems in this area, when there may be only two people on a panel with enough expertise to understand a proposal. However, it was acknowledged that this would be the case with any system. The SIMs suggested using reviewers from other councils’ Colleges/ committees and monitoring success rates of proposals at the edge of panels’ remits. Administrative staff proposed a reserve list

of ex-College members who agree to being approached when there are no suitable current members. SPOs suggested that when necessary, panel secretaries should seek comments from a member of another panel before the meeting, as was done more frequently under the peer review committee system.

Assessing resources requested

Most College members (71%) feel comfortable commenting on resources requested by applicants, but 32% feel that there is not enough time to do it properly at panel meetings (Figure 25). There were few comments on this, but one person thought that “If anything, too much time is spent on discussing minor details of resources that represent a small fraction of the total funding.” Although not related to introduction of the College, it was mentioned that full economic costing (fEC) has made it more difficult to assess value for money. There were also concerns about the level of costs requested on proposals (in particular for investigator time) and differences between costs requested by different institutions, and a few requests for more guidance. NERC administrative staff felt that panels do not always take the time to provide adequate comments on resources requested and suggested more guidance and encouragement to panels to scrutinise costs.

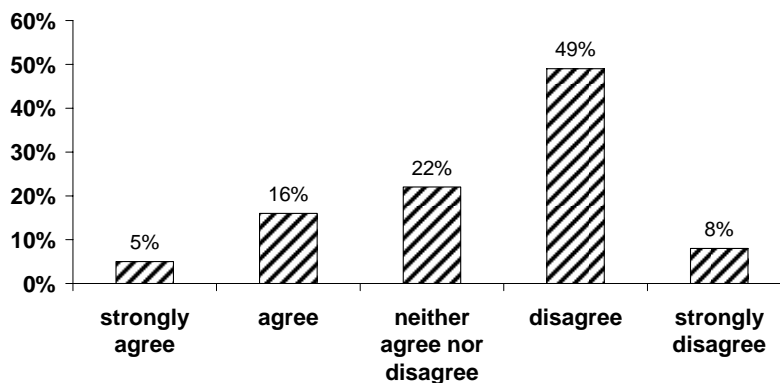
Figure 25: There is not enough time to discuss the resources requested on proposals.



Final ranking

Although the majority of College members believe that the final ranking process is fair (Figure 26), there were several concerns raised by those who did not. The main issues were that ranking can be quite rushed, that some panel members are more forceful than others and inconsistent use of the secondary grading criteria. The most difficult part is ranking those in the middle range, where the cut off is likely to fall, particularly since this is often where most proposals are bunched. Typical comments were: “The issue is not whether [the ranking] it is fair but whether it is meaningful and/or helpful. In my experience, it is possible to rank the top few and bottom few but many in the alpha 4 frame are too difficult to separate to make a ranking of these meaningful.” And: “The final ranking can introduce a somewhat arbitrary element, as it tends to take place when the panel is itching to finish its work, and a few voices can then have a large influence on where a proposal ends up in the rank order. Perhaps a minimum time needs to be allotted to this part of the meeting, and chairs need to be given clearer instructions to take multiple views. One requested allowing recalibration of grades during the day, to account for panels taking time to get ‘into their stride’, and two wanted industrial co-sponsorship to be taken into account.

Figure 26: I do not believe that the final ranking process is fair.



Comments from the open consultation also underlined the difficulties of ranking around the cut-off point, with one suggestion that it would be fairer to draw borderline proposal names from a hat. Again, there were concerns that panels may spend too much time grading proposals and too little ranking them, that particular individuals can sway panels and about the use of secondary criteria. There was also a request for more transparent methods and guidance to panels on the ranking process.

Role of NERC Swindon Office staff

The majority (86%) of College respondents were content that NERC Swindon Office staff provide sufficient guidance at panel meetings to facilitate the process and ensure it is fair. However, one individual noted that the steer from NERC staff in the pre-College era “was much more defined and stronger”.

Other issues concerning moderating panels

A number of College members’ general free text comments related to moderating panels, particularly the key issues of panel membership and constitution. Some were disappointed not to have been invited and would like more parity between members, for example: “Despite me having been a peer review member since July 2006, and my availability of moderating panels being about 70% of the time, I have never been asked to come to a moderating panel...Part of agreeing to be on the PR College was so that I could have more interaction with colleagues across the UK, and this has not been happening.” There were concerns that panels did not always include the expertise to cover all the proposals and the difficulties of putting together diverse panels, with those from one discipline not appreciating the constraints on others potentially resulting in misunderstandings.

NERC SPOs take on the role of panel secretaries and are responsible for selecting panel members, which they do mainly on the basis of fit of expertise to the proposals to be considered and availability. They also try to minimise the number of conflicts of interest panel members will have, by avoiding those from institutions from which there are a lot of applications, and try to avoid using any PIs or CoIs on the proposals to be considered. Within these limits, they try to achieve a balance of gender and experienced versus new College members and to avoid having more than one panel member from the same organisation. However, there is recognition that panel secretaries tend to choose people they know are good panel members. Suggested improvements were: giving SPOs more guidance, having access to more comments on the performance of previous panel members, more feedback on usage of members, booking meeting dates further in advance to increase availability, using chairs to help select panel members and asking panel members which proposals they would like to introduce.

Some consultation respondents felt there should be more consistency (of both chairs and members) on panels, with complaints about the lack of corporate memory, particularly for resubmissions because panels do not know what advice was given last time (although in contrast, SPOs considered this a positive feature, because there is a level playing field for all proposals). There is also a perceived tendency for some new members to give higher grades until they get an idea of the benchmark and concern over the variation in use of the ‘reject’ grade by panels.

Another key issue already touched on concerned proposals that only the two introducers had read, also a common theme in informal feedback to NERC. Respondents stressed the need to keep reiterating to panel members that they should read as many proposals as possible, and at least the summaries of all of them, to allow better debate on all proposals, more robust ranking, cross-correlation between science areas and better feedback to applicants. Otherwise, debate is restricted and introducers’ views are not challenged. It was noted that a generalist viewpoint can be valuable, because it is less influenced by the track record of the applicant and because really good proposals should excite specialists from other fields.

Possible solutions suggested by the College and NERC staff were:

- allocating more introducers per proposal;
- asking people to read a list of extra proposals, (e.g. so each is read by at least 4-5 panel members);
- not having identified introducers and letting chairs pick any panel member to introduce (as happened in some of the peer review committees);
- suggesting a percentage of proposals that members should read; and
- greater emphasis during training.

It was suggested that panel members should be asked to scrutinise proposals they are introducing in sufficient detail to have a view on all aspects, read all others in which they have some expertise well enough to take part in debate about them, and form a view on the summaries of all remaining proposals.

Other issues raised by several respondents were:

- Panel members should have a moderating role only and should not 're-review' proposals. Disquiet was expressed about the power of individual panel members/ chair, particularly where they appear to over-rule the opinions of the reviewers.
- The perception that panels are not equipped to assess 'adventurous' proposals or are biased against them.
- There were opposing views about whether too many or too few reviews are obtained.
- Inevitably, a few respondents were keen to stress that the real problem is the lack of available funds.
- Several College respondents did not like the fact that panel meetings are always in Swindon.
- More positive comments included: "It may not be perfect, but it's the best moderation process I have seen."

In general, NERC staff thought that the *ad hoc* panels work quite well and allow inclusion of members with the right expertise, but that they need to have good chairs and at least half (some think three quarters) experienced members. However, perceived drawbacks are that flexible panels militate against consistency, continuity and development of expertise and corporate knowledge, and are administratively inefficient. Another problem is that panel membership is not decided until after the sift, so members are unable to keep the dates free. Having a nucleus of constant panel membership and chairs was therefore suggested, with additional members added depending on the proposals to be considered. Consistent SPO support, to develop a relationship with panels and chairs, might be helpful. The SPOs also suggested allowing panels to change their indicative grades to take account of the time taken to "warm up".

Some of the SIMs felt that when panel members are not expert in the area of a proposal, they look more at referees' comments and since there cannot be experts for every proposal, this can lead to bias. Like some College members, they would prefer it if panels just moderated reviewers' comments and did not introduce their own views, which applicants are unable to challenge. However, others took the counter view that panel members are used for their expertise and should not 'have their arms tied'.

Discussion of issues relating to moderating panel meetings

How well moderating panel meetings work is a key part of answering all of the Evaluation's objectives: determining the extent to which the College is fulfilling its original objectives of providing better review of inter- and multi-disciplinary research compared to the previous fixed panels, ensuring a consistent level of peer review for all proposals with equitable assessment across all science areas and involving a wider section of the environmental sciences community in NERC's grant assessment bodies; assessing whether the College and associated review process are delivering the quality of peer review necessary to identify the best science; determining whether the College has the confidence of the environmental sciences community; and recommending any changes necessary to improve the performance of the College and extend its use.

There is no doubt that the College system has been successful in involving more of the environmental sciences community in moderating panel meetings. It is also apparent that College members who take part in panel meetings are generally content with the process and have more confidence than others in the community that proposals are fairly and consistently treated.

A recurring theme in consultation comments was the selection of panel members, particularly whether panels always include the best balance of expertise to cover the diversity of proposals being assessed, whether the most appropriate members are chosen and why some had never had the opportunity to participate. There was specific concern about proposals at the edge of panels' remits. NERC should therefore take more care when choosing panel members to address these issues. Extra introducer comments should be sought when necessary, e.g. from other panels, other research councils' committees or ex-College members (Recommendation 2.5).

A major problem is lack of availability of members. Ideally, NERC would allocate panel areas to dates at an earlier stage and get potential panel members to hold these dates (Recommendations 2.3.2 and 2.3.3). However this is not straightforward, given that the required expertise cannot be finalised until proposals are sifted. SPOs should be given more guidance, including the proportion of experienced panel members to include, while seeking to involve a wider range of College members on panels and to consider members they are not familiar with (Recommendation 2.3.1). To aid this, NERC needs to ensure that it obtains good descriptions of all members' expertise. Other possibilities that should be considered are involving panel chairs

in selecting panel members and using only more experienced members for Consortium panels. Again, there is a need for more transparency about how panel members are selected.

Concerns about the lack of continuity and corporate memory of *ad hoc* panels could be addressed by a return to standing panel chairs, with a nucleus of constant members. However, this would negate some of the advantages of flexible panels, such as involving more people in assessment meetings, minimising conflicts of interest and moving away from the perception of an 'old boys' club'. To incorporate the best aspects of both systems, the suggested solution is to have a pool of chairs and a 'rolling core panel membership' (Recommendations 2.1 and 2.2.2). Chairs are pivotal to how panels function, so having a pool of more experienced chairs who have received extra training should help to increase confidence in the assessment process and ensure a level playing field for all proposals, including those that are risky and/or multidisciplinary. The process for selecting the chairs will need careful consideration and must be transparent. The 'rolling core' membership could consist of a small sub-section of a panel that is asked to attend consecutive panel meetings for the same grant type; it should include the person who will be chairing the next meeting (Recommendations 2.2.1 and 2.3.4). The details of how this would work again need further thought. The aim would be to provide more consistency between meetings and to increase the overall experience level of each panel.

Although not unique to the College system, there is concern that particular individuals, especially when introducing proposals, are more vocal than others and can have too much power over decisions. Despite participation in 'mock panels' at training events, some less experienced members may not have the confidence to state their views as strongly as more senior members. It is therefore proposed in Recommendation 2.7 that introducers are asked to give 'pre-scores', as EPSRC do. This would mean that less experienced introducers might be less tempted to change their views to fit in with more experienced panel members. It would also allow better benchmarking, because a clearly high and low-graded proposal could be discussed first, and would help with timekeeping/ planning because it would be more obvious which proposals were going to be contentious.

A key issue that emerged was the importance of panel members reading as many proposals as possible. As summarised in Recommendation 2.4, the various ways suggested to achieve this each need further consideration. Every opportunity, including training events, should be taken to emphasise the level of commitment required to properly prepare for a panel meeting.

Another matter to take into account is the number of external reviews obtained and how they are presented by the introducers. Introducers must be advised to give sufficient weight to expert reviewers; while they should continue to offer their own views based on their personal expertise, they should not usually bring up major issues not identified by the reviewers (Recommendation 2.6). This should aid in removing any potential for bias in panels that include experts in the fields of some of the proposals under consideration but not in others. However, in exceptional cases when a panel is absolutely sure that it has spotted a crucial flaw that the reviewers have missed, it would not be appropriate for the proposal to be graded in the funding frame. Since the data illustrate the high proportion of external reviewers who award $\alpha 4$ grades, it is important that panel members continue to focus on reviewers' comments, because they may not match their grades. It is therefore to be expected that proposals may obtain a final grade lower than the average of the referees' scores.

Some College members feel that the final ranking process can be too rushed and that the secondary grading criteria are not used consistently. Having a pool of chairs who receive extra training would help to address these concerns. However, the stated difficulties of ranking proposals around the likely funding cut-off point are not specific to the College system and are exacerbated by the lack of sufficient funds to cover all $\alpha 4$ -graded Standard Grant proposals. Recommendation 2.8 recognises the need to reconsider the secondary grading criteria (also a recommendation of the Blue Skies Review, 2006). The grading system will also require changes to accommodate the new joint research council grading framework.

Most College members think that the guidance provided by NERC staff at meetings is sufficient, although there was some support for a stronger steer when necessary. The concern that *ad hoc* panels take time to 'warm up' and get a feel for benchmarking of grades could be addressed by encouraging panel members to meet up informally the night before meetings (Recommendation 4.3).

Discussion of consistency of assessment across NERC's remit

The College was intended to promote equitable assessment across all science areas. However, it is evident that some of NERC's traditional science areas have better success rates under the College system than others and this has also been noted by the community, with two thirds of the College believing that there are inconsistencies in grading across disciplines. This is not a new phenomenon, nor an easy one to resolve; measures such as ensuring representation of all science areas, developing a pool of chairs and continuing the practice of the same NERC staff attending all panel meetings to encourage adherence to grade definitions should bring improvements. The success rate of the traditional NERC science areas is not monitored because the College system has moved away from categorising proposals in this way.

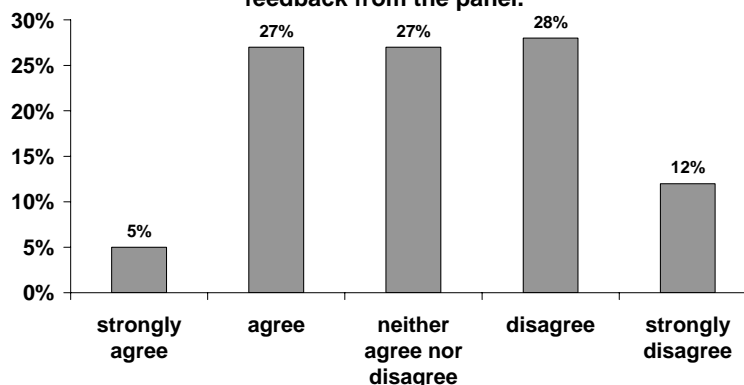
Feedback to applicants from panel meetings

Figure 27 shows responses to the open consultation question about the usefulness of feedback from panels on unsuccessful proposals. Many of those commenting felt that feedback was often too vague/ general and needed more detail to explain what the panel really thought about a proposal, why it was rejected and possibly a "how might this proposal be improved to make it successful in the future" section.

People cited variable experiences of feedback, ranging from "extremely helpful" to "worse than useless". One respondent had found that the quality and detail of feedback was much improved compared to before the College and explained how the decision had been reached, although sometimes revealing that panel members had made decisions based on flawed opinions; others that it was difficult to interpret when reviewers had differing opinions, and that it was sometimes clear that subject expertise for a proposal had been lacking. It was felt that comments from researchers of an inappropriate discipline could be superficial and unhelpful. Previous feedback and complaints to NERC have included similar criticisms that panels sometimes "get hold of the wrong stick or have a hidden agenda" and there should be a way to challenge their opinions.

Several people suggested that comments should be supplied to applicants of funded and unfunded proposals automatically. There were also pleas to find out scores, where proposals are ranked and even for panel members to provide verbal feedback, as was stated to be the case in Finland. Others favoured the USA's NSF system, where independent programme managers oversee the process, give feedback on improving proposals and sometimes negotiate "near-miss proposals".

Figure 27: When a proposal is unsuccessful at a moderating panel meeting, there is sufficient useful feedback from the panel.



Discussion about feedback to applicants

Applicants cited differing experiences of the usefulness of feedback from moderating panels, and for proposals rejected at the sift. These concerns will be addressed mainly by the measures already described to ensure high quality College and panel membership, as well as continuing to emphasise the importance of thorough and accurate reviewer and introducer comments in College training and guidance material.

Further consideration is needed about whether feedback could be given to all applicants (including successful ones) automatically and whether applicants should be able to find out where α 4-graded proposals were ranked. Giving automatic feedback is likely to be more feasible when grants administration moves to the research councils' Shared Services Centre and the new back office computer system is implemented.

Multidisciplinary research

To get a very rough estimate of the proportion of multidisciplinary research proposals and awards in responsive mode, data on the proportions classified as covering more than one science area (from

atmospheric, earth, freshwater, marine, terrestrial sciences) were collated. Using this proxy suggested that there has been an increase in the percentage of multidisciplinary proposals and awards for all responsive mode schemes in the last 7-8 years; for example, from 25% of Standard Grant proposals (19% of awards) for the July 2001 round, to 45% of proposals (46% of awards) for the July 2007 round. The data suggest that proposals covering more than one science area are as likely to be funded as others.

However, these data should be interpreted with caution because:

- not all proposals classified as covering more than one science area are multidisciplinary (e.g. they may be at the boundary of two science areas);
- proposals may be multidisciplinary but still be relevant to only one science area, e.g. physical oceanography with marine biology; and
- proposals have been classified by the applicants with no validation by NERC staff since 2003.

Moderating panel areas

Under the College system, the science areas of Standard Grant moderating panels and Fellowship interview panels vary each round, depending on the proposals received. One of the aims of this system was to improve the assessment of inter- and multidisciplinary research. There are usually 5 Standard Grant panels and 4-5 Fellowship panels per round. Panels have not been given names that describe their science area coverage since the start of 2006.

Consideration of panel areas revealed that although there is some variation from round to round, the Standard Grant panels usually include a general ecology panel, one including most of the pre-College earth sciences remit, a panel concentrating on biogeochemistry (sometimes with hydrology), one that includes most of the pre-College atmospheric sciences area (although often combined with physical aquatic sciences, climate change etc.), and another that covers genetics and/or evolutionary ecology. Changes tend to be at the edges of these remits and in the inclusion of areas such as palaeo-sciences, science-based archaeology, glaciology and sedimentology. There also appears to have been more consistency of panel areas in the last two years. Some staff commented that panels may now, in fact, be more mono-disciplinary than the old peer review committees (e.g. marine sciences PRC) and that there may be rather artificial splits to try to get approximately equal numbers of proposals to be considered by each Standard Grant panel (~25-38). In contrast, the atmospheric sciences peer review committee usually considered only about a third of the number of the proposals assessed by the terrestrial sciences committee.

Fellowship panel compositions are similar, but data are less complete and there is only one closing data a year, so it is less easy to comment on trends. New Investigator proposals are all considered at one meeting, with a truly multidisciplinary panel, and the same is true for Consortium Grant and Knowledge Exchange proposals. Small Grant proposals are usually split into two panels (broadly physical and biological sciences), so these panels also include many disciplines.

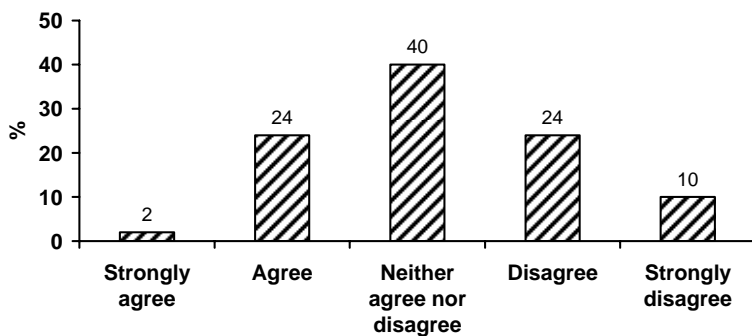
Assessment of multidisciplinary proposals

47% of College respondents find inter and multi-disciplinary proposals⁸ difficult to assess, whereas 32% disagree and the remainder neither agree nor disagree. Only a quarter of members thought that such proposals are fairly assessed under the College system (Figure 28), but it was suggested that multidisciplinary Consortium Grant bids tend to be more successful.

Comments recognised the difficulties in assessment because most reviewers cannot comment on the whole, but instead review their specific area as if it were a single topic proposal. Members would like to see more cross-Council support/ review and expressed concerns about the remit overlap between NERC and BBSRC. Ideas for improvement included initial assessment by objective generalists rather than focused specialists and more introducers at panel meetings to offset any lack of expertise.

⁸ multidisciplinary research was defined here as: when experts from different fields work together on a common subject within the boundaries of their own discipline; interdisciplinary research: when a point is reached where a project cannot progress further, experts may bring themselves to the edges of their own fields to form new concepts and ideas and create a new interdisciplinary field.

Figure 28: I think that inter- and multi-disciplinary research proposals are fairly assessed under the College system



Aspects of the proposal about which they know very little. Moreover with a wider range of reviewers, there is inevitably a greater range of comments to address.

It was proposed that each review could be clearly labelled with the area of expertise of the reviewer and more training provided to College members. One respondent felt there was a particular issue for large marine grants including physical science and biology. Another thought that interdisciplinary proposals and those in highly specialised areas are particularly at risk if they do not go to full peer review.

Similarly, it was felt that panels are often not sufficiently inter-disciplinary to accurately review all aspects of proposals, and that perhaps applicants should be able to specify key areas of expertise they feel need to be represented. One commented: "As I am somebody who works on projects that do not neatly fit into disciplinary categories, I do not feel that the current system is particularly helpful. Indeed on one occasion, there was nobody on the panel that assessed my proposal who would have been able to give an informed opinion, with the result that the feedback I received from the panel (on the award of alpha 3) simply repeated the few minor queries made by the referees despite the fact that I had already answered those queries in my responses to the referees comments!". It was suggested that panels needed to take a balanced overview when assessing a broad range of somewhat subjective reviewer comments, since answering several reviewers from different fields makes it almost impossible to please everyone.

Although some recognised that the research councils now encourage inter- and multidisciplinary research and treat such proposals well, it was suggested that this needs to be publicised more to reassure applicants that their proposals will be handled appropriately, particularly because it is considered harder to write a strong multidisciplinary proposal than a single discipline one. There were concerns that multidisciplinary grants are not co-funded with other councils enough, and also that NERC does not collaborate as well with AHRC as with other councils.

37% of College respondents agreed that inter and multi-disciplinary proposals would only have the same chance of success as other proposal types if the

As Figure 29 illustrates, results from the open consultation were even more negative. Respondents recognised that interdisciplinary proposals could be more difficult to review and judge fairly. Therefore again, many of the comments related to the problem of finding reviewers able/ qualified to assess a multidisciplinary proposal as a whole. It is felt that instead, individual reviewers from a variety of disciplines are used, which disadvantages proposals because each reviewer judges the value purely from within their own discipline, sometimes expressing doubts about, or dismissing as insignificant,

Figure 29: Inter- and multi-disciplinary research proposals are not fairly assessed under the NERC College system.

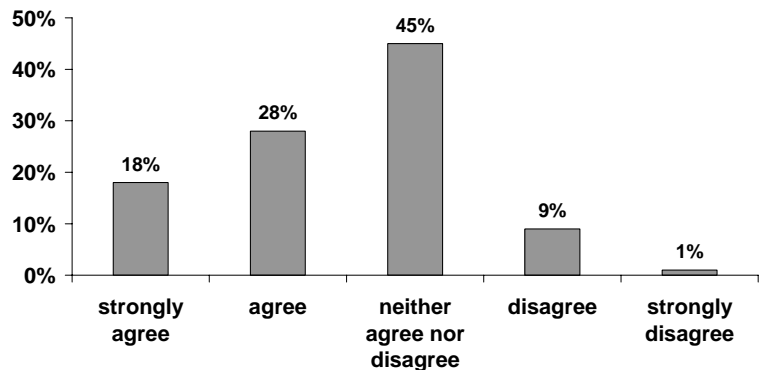
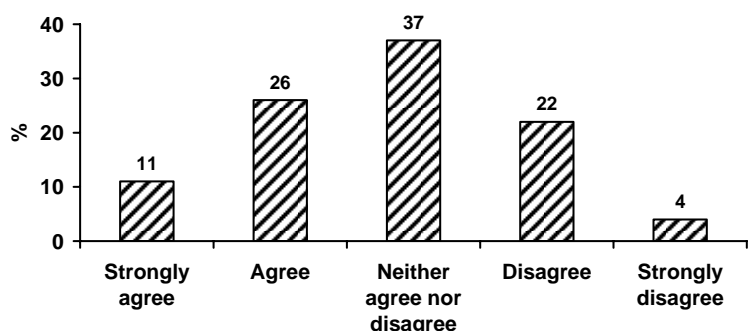


Figure 30: Inter- and multi-disciplinary proposals can only have the same chance of success as other proposal types if the assessment process is changed.



assessment process was changed (Figure 30). Suggestions included:

- ensuring panel chairs and members have a proven record of inter- and multi-disciplinary work;
- using assessors from outside the NERC community;
- asking experts in each discipline to comment only on their areas of competence, not on the proposal as a whole;
- providing an option to expand parts of a multi-disciplinary proposal to allow equivalent space for the ideas as in a single issue proposal; and
- an interdisciplinary research council to review all cross-council applications.

NERC staff had similar concerns about review of multidisciplinary proposals, although it was felt that Consortium proposals, which are often interdisciplinary, receive a good level of review. Some pointed out the difficulty in identifying interdisciplinary research and that environmental science is interdisciplinary by nature. Since applicants still appeared to have concerns about proposals falling between council remits, it is felt that the councils need to publicise steps already taken to improve the process and the existing level of co-funding of proposals. However, it was pointed out that cross-council proposals may not be interdisciplinary, just at a remit boundary. SIMs suggested that cross-council proposals should be flagged to the College, so they are not downgraded, and that this should be part of members' training. SPOs also proposed that when necessary, extra comments could be sought from non-panel College members, or even other RCs' College members. Although Small and New Investigator Grant panels are interdisciplinary, ranking proposals can be difficult, because there is little expertise in each proposal area.

Discussion of issues relating to inter- and multi-disciplinary research

One of the original objectives of the College was better assessment of inter- and multi-disciplinary research. This is a difficult area to assess, because such proposals are not easily identified in order to track their success. The limited available evidence suggests that NERC is receiving an increasing proportion of multidisciplinary proposals and they are approximately as likely to be funded as other types of proposals. However, many consultation respondents did not have confidence that multidisciplinary proposals are being fairly assessed. Most of the criticisms raised are not specific to the College system, the main one being the difficulty of finding reviewers able to assess the proposals in their entirety. Work carried out by EPSRC⁹ on the level of consensus between referees demonstrated that those from the same discipline agreed with each other's assessment of quality almost twice as often as those from different disciplines. This suggests that multidisciplinary proposals are less likely than others to gain uniform high grades and so may fail at the sift stage, and are more likely to generate disagreement between introducers and problems reaching grading decisions at panel meetings.

Although some believe that flexible panels facilitate inclusion of the expertise needed for all aspects of multidisciplinary proposals, some think that they are not always multidisciplinary enough. There did not appear to be radical variation in the topics covered by Standard Grant panels from round to round, mainly because there are limited ways to split the NERC science remit into sensible groupings. However, coverage of panels can evolve to take account of changes in popularity in different science areas and emergence of new fields. NERC needs to ensure that panel secretaries are given sufficient guidance in setting up panels (Recommendation 2.3.1) and scientific areas should not be artificially split in the attempt to give each panel the same workload.

Although there is now a framework for joint research council funding of proposals, consultation comments suggest that this needs better publicity (Recommendation 4.1) and that some inter-council remit issues remain. This is an area in which advice from College members may be helpful.

In conclusion, assessment of multidisciplinary research is recognised as a problem, but is not unique to NERC. The research councils have improved the handling of proposals at remit boundaries and some of this Evaluation's recommendations (e.g. having a pool of chairs and giving more guidance to College members) will help, but further ways to improve the assessment of multidisciplinary research are needed. Suggestions to consider included: giving applicants the opportunity to list the areas that need to be reviewed/ represented on moderating panels so that NERC can ensure that these are covered (which may necessitate including non-NERC reviewers/ panel members); asking reviewers to describe their area of expertise in carrying out a

⁹ Mark Claydon-Smith, EPSRC, 1994

review and limiting their comments to relevant areas; having extra introducers/ getting extra introducer comments from members of other panels or councils' committees (Recommendation 2.5); and providing more training and guidance for reviewers. This should stress the need to take an overview and balance the range of reviewer comments on different aspects of a proposal, so that multidisciplinary research is not disadvantaged (Recommendation 2.9).

Comparison of the College with the peer review committee system

Of those responding to the College consultation, 18% had been members of a pre-2003 peer review committee, so completed the questions on whether or not the College is an improvement on the previous NERC review system (Table 16). The responses showed a division of opinion, but more respondents felt that the peer review committee system provided better quality and consistency of review and a better standard of debate at moderating panel meetings. Only 20% of respondents thought that inter- and multi-disciplinary research have been more fairly assessed since introduction of the College.

However, the majority of respondents agreed that it is an advantage that panels can now be tailored to cover the proposals under consideration and that having a greater proportion of the environmental sciences community involved in assessing responsive mode proposals is an improvement.

Table 16: College members' responses to consultation questions comparing the College with the peer review committee system. Respondents were asked to indicate whether or not they agreed with the statements. The top figures are the number of respondents selecting each option, the bottom figures are the %.

	strongly agree	agree	neither agree nor disagree	disagree	strongly disagree
a) The quality and consistency of review was better under the pre-2003 committee system than now.	7 16%	14 31%	10 22%	13 29%	1 2%
b) Inter- and multi-disciplinary research† have been more fairly assessed since introduction of the College.	0 0%	9 20%	19 42%	16 36%	1 2%
c) The standard of debate at moderating panel meetings was better before introduction of the College.	9 21%	12 29%	14 33%	7 17%	0 0%
d) An advantage of the College system is that panels can be tailored to cover the proposals under consideration.	5 11%	22 50%	4 9%	12 27%	1 2%
e) College members have a higher workload than members of the pre-2003 committees.	2 5%	7 16%	13 30%	14 32%	8 18%
f) It is an improvement that the College system involves a greater proportion of the environmental sciences community in assessing responsive mode proposals than the pre-2003 committees.	3 7%	23 52%	9 20%	8 18%	1 2%

Some of those providing free text comments felt that despite NERC's best intentions, panels now work less well, largely because it takes at least one meeting to get used to the decision-making process and because of the perception that peer review committee members used to read more proposals, so more views contributed to the final grade. There were two comments about committees with 'memory' being more important than tailoring of panels. It was also felt that peer review committees following traditional disciplinary boundaries meant that members used similar criteria and standards. It was suggested that panels should be made up from a sub-set of College members, who would get to know each other and would do a better job as a result of this group dynamic.

Concerns were once again raised about the lack of respected senior members and overall balance of experience of College members and therefore the quality of decision making. One respondent felt that there was an improvement when the College was first introduced, but many of the better-qualified members have now rotated off. However, another felt that the College has more potential to draw on a wider spectrum of research stakeholders. Issues were raised with the treatment of resubmissions: the panel is not aware which these are and do not see the previous paperwork; however, some members may have seen them previously, so it is not a level playing field.

Of the further 85 general comments submitted by College respondents, around a third were positive statements about the administration of the College and the system, comparing it favourably to the previous NERC system and the processes run by other research councils. For example: “It is a big improvement and should be maintained and enhanced”, “I think the peer review college works very well and is an asset to NERC”, “The current system has been a real success and sets an example to others”, “far superior to previous models” and “I am involved with a similar system for another research council, and NERC’s College is far more efficient, transparent and effective!”.

The external consultation also asked for views on whether or not the system has improved since introduction of the College. Most respondents were ambivalent, although slightly more felt that the old peer review committee system was better for quality and consistency of review and for assessing inter- and multi-disciplinary research (Table 17), whereas the College system was favoured for involving a greater proportion of the environmental sciences community in assessing responsive mode proposals.

Table 17: Responses to open consultation questions comparing the College with the peer review committee system. Respondents were asked to indicate whether or not they agreed with the statements. The top figures are the number of respondents selecting each option, the bottom figures are the %.

	strongly agree	agree	neither agree nor disagree	disagree	strongly disagree
a) The quality and consistency of review was better under the pre-2003 peer review committee system than now.	47 9%	80 16%	293 58%	69 14%	18 4%
b) Inter- and /multi-disciplinary research† have been more fairly assessed since introduction of the College.	3 1%	45 9%	351 70%	73 15%	29 6%
c) I think it is an improvement that the College system involves a greater proportion of the environmental sciences community in the assessment of responsive mode proposals than the pre-2003 committees.	32 6%	164 33%	220 44%	62 12%	24 5%

There were 126 comments relating to these questions, but nearly 40% of these stated they were unable to compare the two systems and several more noted pros and cons with both systems. Others commented that there were problems common to any system, such as proposals where the panel has little expertise, and that the best proposals probably get funded under both systems. Several respondents recognised that the old system was not sustainable given the growth in volume of applications and consequent referee overload, but one suggested it would have been better to tackle this by limiting the number of applications departments could submit.

Most of the reasons cited for preferring the old system have been considered already:

- there was no sifting of grant proposals and proposals were sent only to expert external reviewers;
- now perceived that a proposal can be rejected on the strength of one unfavourable review and that there is more variability in the number of external reviews obtained;
- College membership is too heterogeneous in terms of discipline and academic standing. There is “randomness” in reviews and more “old hands” are needed to “get the system back on track”.
- some science areas, especially young research fields/ small communities, are considered to be under-represented on the College as there is not enough expertise in UK;

- College reviewers perceived to prefer “‘sexy’ options and presentations at the expense of quality science”;
- not convinced there has been an increase in the proportion of the community involved in the peer review process because fewer people now provide external reviews, although others felt it was better to involve fewer reviewers with high levels of expertise than to involve lots of people;
- the College does not have the community spirit of the peer review committees and not all members have the same level of commitment, so the workload is unevenly spread.
- continuity of panel members was thought to be advantageous and peer review committee members were thought to have read more proposals;
- inter- and multi-disciplinary proposals had a better chance of being properly discussed by the peer review committees;
- the College system is seen as less transparent and NERC staff as less ‘visible’; and
- the College system is thought to have workload and administrative advantages, rather than improving quality of review.

In contrast, reasons stated for preferring the College system included:

- NERC is “the leading Council in this area” and “should be commended for hosting the fairest and most transparent review process”;
- the inclusion of more people on the College and panels, who have the advantage of seeing how the processes work and what makes a good grant proposal, which is felt to be particularly valuable for those from organisations lacking a track record of NERC funding;
- the peer review committee system was perceived to be prejudiced against applicants who were not involved, particularly new researchers, and liable to “long-term biases in the research preferences of the Panels”. The College allows a broader and fairer assessment of grants, because involving more people helps counteract any individual bias;
- the College is better for assessment of inter- and multi-disciplinary proposals;
- more reviews are obtained per proposal under the College system; and
- panel feedback is now better.

A similar mixture of views was expressed in feedback received before this Evaluation. This included positive comments about the College system being “an excellent move”, which has opened up the review process to a wider audience and is more democratic, fair and diverse, with flexible panel membership seen as an advantage particularly for interdisciplinary research. However, it also included negative comments, such as a few suggesting the College should be disbanded in favour of a return to full “external” review of all proposals and others that assessment is now more “random”, so they put in more applications in the hope that one will get through. Similar specific concerns were raised to those from the consultation regarding panel membership, loyalty of members, assessment of ‘adventurous’ research and treatment of resubmissions. Some found it problematic that members of *ad hoc* panels did not know how generously others graded, group dynamics changed each time and inexperienced College members could be easily intimidated by more experienced members so may not contribute much to discussions.

NERC staff like having the flexibility to select panel members suited to the range of proposals to be considered and to minimise the number of vested interests. Administrative staff commented that the quality of College reviews has improved as result of training and guidance, but thought that the quality of debate and rigor of moderation at panel meetings is lower than in peer review committee days, largely because members do not read as many proposals. There were fewer concerns for Fellowship assessment, which has changed less. It was noted that although NERC receives complaints about quality of reviews and comments not matching grades, we received similar complaints when we had standing committees.

Discussion of comparison between the College and the peer review committee system

To assess the extent to which the College is fulfilling its original objectives, comparison with the previous peer review committee system is needed. Results show that the College has successfully met its original objective of involving a wider section of the environmental sciences community in assessment of responsive mode proposals, and the majority of consultation respondents who expressed an opinion said that this aspect was an improvement on the previous system. Many College members also believed it to be advantageous that panels can now be tailored according to the proposals to be considered. However, it is disappointing that more preferred the peer review committee system to the College for quality and consistency of review and standard

of debate at panel meetings, since ensuring a consistent level of peer review for all proposals and equitable assessment across all science areas was another aim of setting up the College. Similarly, it was hoped that the College would improve the review of inter- and multi-disciplinary research, but the majority of those with a view on this thought that it had not been achieved.

However, opinions were divided on these points and many respondents answered ‘neither agree nor disagree’ to the questions, particularly in the open consultation. Free text comments suggested that this was because either they did not have sufficient knowledge to compare the systems, or that they did not favour one system over the other because both have advantages and disadvantages; it is recognised that no peer review system can be perfect. So although no comparable survey of the community’s views on the peer review committee system was ever carried out, it seems likely that a similar range of opinions would have been expressed.

It is concluded that the varied views articulated about the College do not warrant its abolition in favour of a return to the peer review committee system or a different model. Instead, modifications are proposed above to improve aspects about which the community has concerns. Where appropriate, these incorporate features of the peer review committee or other research councils’ systems.

The perception that College members lack the commitment and ‘community spirit’ of the peer review committees is a difficult one to address: to some extent, this may be inevitable with a larger body of people. Some consultation respondents believed that although panel members’ workload is lower than that of the old peer review committees, fewer members now read all the proposals. However, it is clear that the majority of College members undertake a great deal of excellent and thorough work on NERC’s behalf. Closer monitoring of members’ performance and availability, proposed in Recommendation 4.2, would allow NERC to more easily identify those members who are less committed. As already suggested, appointing a larger proportion of College members by invitation may help to encourage a sense of pride in membership (Recommendation 1.1). Holding general meetings for members might also foster networking and a greater feeling of belonging to a community (Recommendation 4.3).

Is there bias in the review process for/ against College members?

Since the College started (4.5 years of data), 32% of responsive mode grant round applicants are, or have been at some time, College members. They have a higher success rate overall: on average 27% of proposals funded, compared to 17% for those who have never been on the College (Table 18).

Table 18: Overall % success rates of College members compared to others

	All applicants	College/ ex-College	Others
Total funded	19.9	26.7	16.7
Total unfunded	70.1	63.1	73.4
Total to be decided or withdrawn	10.0	10.2	9.9
Overall Total	100.0	100.0	100.0

However, although College members are less likely than others to have their proposals rejected at the sift stage, they are equally likely to be unsuccessful at the panel meeting stage (Table 19).

Table 19: Success rates of College members compared to others at the sift and panel meeting stages – as percentages

	All applicants	College/ ex-College	Others
Rejected at sift	35.4	28.8	38.5
Unsuccessful at panel meeting	34.7	34.3	34.9
Total Unfunded	70.1	63.1	73.4

Since the start of the College, a total of 1275 responsive mode applications have been made by individuals who have been College members at some point. Of these, 48% were made by current members, 39% by people who would become College members and 13% by ex-members.

Looking at those proposals for which a decision has been made, success rates for members before and during their membership are 29%, rising to 32% when they leave the College. Compared to non-members, whose average success rate is 19%, College members are on average more successful applicants even before they join the College, and their success rate increases further after they have left the College.

NERC SPOs did not believe that College members are biased towards each other's proposals. They pointed out that College members follow NERC's vested interests policy, that fewer panel members have proposals being considered at their meeting than under the peer review committee system (typically one at most), and that members will not always know whether an applicant is a College member because they are unlikely to know all members, so bias is less likely. Observation of panel meetings also supports this view.

Discussion of whether or not the review process is biased

The data suggest that although College members tend to be more successful than others in gaining responsive mode funding, their average success rate does not increase when they become College members, only after they leave the College. This is not surprising, because those with a higher than average success rate are more likely to be selected as College members, and members should learn more about how to write fundable grant proposals as a result of their College experience.

Communication with the College

College members were asked about the frequency of communications they receive from the College: 94% stated that this is about right, only 4% that it is not frequent enough. 91% felt that they receive all relevant information and only 6% that they are not well enough informed. 95% prefer e-mail for communication. A few prefer to receive information by hard copy, particularly proposals, with some commenting that they do not want to have to spend time printing material out and that they need hard copies for work while travelling.

College members' views were sought on the NERC College website: there were 208 responses, with the most common answer being that it was rarely used, with most only visiting to download forms etc. Some had never used it. Many said they find the College pages difficult to find, so it is hard to access relevant information in a hurry. However, quite a few made comments such as: "I think the College Website is good. I don't use it that often but when I do it has everything I need and is easy to access". Some suggested it might benefit from better organization and should be updated more frequently. Only two people were interested in adding bulletin boards/ discussion fora, with most commenting that they were too busy to participate in this or to read any extra information.

Most find the annual performance reports useful (34% very useful, 51% slightly useful), with 34% stating they would like more feedback on their performance and 41% that they would not. A common theme in the free text comments was that members would like to be told the outcomes for proposals they have assessed as soon as possible. Many would also like to know how their opinions compared to those of other members, to help them evaluate their performance. Some suggested that more frequent feedback to members (e.g. after each round), giving the other reviewers' grades (and even comments), and highlighting when reviews need to be improved, would be useful. Those who had not been on a panel had no way of "calibrating" their reviews against others.

NERC staff thought the performance monitoring system was useful, but that more was needed, with those not performing well enough being warned and asked to leave if there was no improvement. If members were paid per review, payment could depend on the review being of acceptable standard. It was recognised that we do not currently have the staff resources to provide individuals with more feedback on the quality of their reviews. It was suggested that feedback to members after every round would be useful, and that SPOs could be given a template to provide feedback when they are marking up comments.

Discussion of communications issues

When it comes to communications between NERC and College members, nearly all are happy with the frequency and amount of information that they receive and for most of this to be via e-mail. Although many are in favour of electronic peer review, some still prefer hard copies of proposals, so this option should be retained. It is disturbing that some were unaware of the College website, since it includes the terms and

conditions of membership, panel meeting papers and guidance notes for College reviewers. There was very limited enthusiasm for more information or interactive web pages. The key message was that College website needs to be better-publicised, with information that is easier to find, well-organised, targeted, relevant and up to date (Recommendation 4.4).

Many College members would like more opportunities to interact with other members and NERC staff and a greater feeling that their work matters. It seems that a voluntary annual meeting would be popular; this could include discussion of funding policy/ process issues, presentations by funded PIs and extra training (Recommendation 4.3). To obtain more regular individual feedback, Recommendation 4.5 proposes introducing an 'exit questionnaire' for those leaving the College.

Most members find the annual performance reports useful to some extent, although some would like more information to help them to improve the quality of reviews and consistency of grading (Recommendation 4.2). NERC also needs to monitor review quality more closely to identify members who are providing inadequate reviews; they should receive warnings and if there is insufficient improvement, should be asked to leave the College. However, the necessary additional staff resources will have to be balanced with the overall budget for responsive mode grants. Electronic peer review will help because reviews will routinely be returned for amendment if they lack information or contain inappropriate comments, but this will still entail additional SPO resource.

Developing the College

Pool of Chairs

To the question "Would you like the College to have a pool of designated panel chairs, who receive extra training?" 71% of members replied yes, 21% no, 8% don't know. If such a group existed, 65% thought that its members should be paid more, 23% that they should not; 48% did not think that they should also be asked to undertake reviews, 40% that they should. Free text comments provided support for more permanent chairs, or a recognised route to becoming one, and reinforced the need for training to ensure high standards because chairs have a critical role. Some thought that they needed to have about 3 years of previous College experience, so would need to stay on the College for a longer term. The few with reservations about this idea were keen to avoid any perception of a fixed system where the same people make decisions. Comments received prior to this Evaluation also stressed the importance of guidance from experienced chairs, who in the days of the peer review committees, acted as "important bridges between NERC and academia".

All groups of NERC staff consulted strongly supported having a pool of chairs, likewise recognising that a good chair is crucial to the functioning of the panel and believing that this would provide more consistency between meetings and development of a benchmark standard. Staff suggested identifying good chairs, or potential future chairs, from the current College and inviting them to stay on to join the pool of chairs. Chairs would need to have sufficient panel experience, but being asked to serve as a chair for an extra three years would be a significant commitment. To attract people of high calibre, staff therefore felt that chairs should be paid more and that this should be seen as a more exclusive group of the College.

There was agreement that chairs would benefit from extra training, and it was proposed that future chairs could first observe an existing chair in action and attend their briefing meeting. "Washup" meetings for chairs would allow them to share experiences.

Payment of College members

College members were asked how they would prefer to receive payment. 59% favoured the current annual honorarium, with only 11% preferring payment per review/ meeting, 7% wanting half the current honorarium plus payment per review/ meeting, 6% preferring payment per review to departments and 4% considering that payment is not necessary; 12% expressed no preference. Some members commented that the payment was trivial after tax and that reviewing should be a requirement for those submitting proposals, but others felt it was some compensation for the extra work. It was considered that a more complex payment scheme would be harder to manage, but it could allow overseas reviewers to be paid

Several respondents were concerned that if payment was made to departments, reviewers would be unlikely to benefit and response rates might fall. However, some would prefer this because they could make more

appropriate use of the money for their research and a few thought that if this was based on number of reviews/meetings undertaken by their members, this would encourage HoDs to value the activity.

NERC staff had differing opinions on this question. Some SPOs liked the existing system (but with more monitoring of usage), whereas others wondered whether the contract with members worked and whether payment per review (if it passed a quality threshold) would be fairer and encourage members to carry out reviews. The SIMs thought that paying an honorarium gave the wrong message and was not enough to have any hold over members, preferring EPSRC's payment per review to departments; departments gained money and kudos, so this might encourage people to join the College and do reviews. However, senior staff were concerned about the work involved in paying per review and suggested considering more consistency with how other NERC panels are paid. Research Grants staff felt that the current contractual arrangement was necessary to ensure submission of initial reviews and for the sift process to work. They considered the honorarium did provide some incentive to join and recognition of the effort involved. However, they also suggested paying half the honorarium plus a payment per review (similar to a 'performance-related bonus') as a fairer and more flexible system.

Wider use of the College

College members were asked whether they would like the opportunity to use their skills in NERC's wider activities: 49% answered yes, 23% no, 28% didn't know. Members suggested that the College is a valuable resource, representative of the environmental sciences community and with knowledge of the breadth of work NERC supports, which NERC could involve more in other areas. They also felt that scientists who rely on research council funding should be more involved in some of the major decisions that affect them. Proposed areas included:

- suggesting funding initiatives, and planning and science advice;
- contributing ideas to, and commenting on, strategy/ research priorities/ programmes/ policy, e.g. working with theme leaders;
- forming expert panels;
- more opportunities to provide feedback on assessment process and give views on options for new types of awards;
- assessing other funding modes, including taking part in panels to ensure the same standards apply across NERC; and
- communicating NERC science to the public.

Several suggested that College members should act as "conduits for informing NERC on community thoughts on strategic activities", transferring viewpoints and ideas. This wider involvement would counteract the current feeling of isolation from NERC activities that some members mentioned, e.g. "Reviews should be considered just one part of membership, would like to see more 'status' in that views sought on broader issues relating to science in UK and Europe." However, quite a few respondents put the counter view that they would not want to create privilege access to NERC planning, or were no more qualified to provide input than other members of the community, and that it would increase their workload.

NERC SPOs and SIMs would value College members' views and advice on council remit boundaries, which are constantly evolving. Staff pointed out that College members are already involved in review of NERC services and facilities and directed programmes. They will continue to be involved in assessing quality of research programme proposals, partly to provide benchmarking across funding modes, but will not usually be asked to assess fit to NERC strategy. Senior staff also suggested involvement in assessing National Capability.

SPOs proposed more encouragement to members to respond to NERC consultations and greater involvement in discussions on funding policy (although some already give feedback). Senior staff agreed that focus groups on policy issues would be useful when appropriate. If there was a pool of chairs, they could possibly become more involved. NERC also needs College members to be supportive of NERC and spread a positive message to the rest of the community. Links between SISB and the College could also be strengthened by having a pool of chairs, which could have a representative on SISB and/or report to SISB.

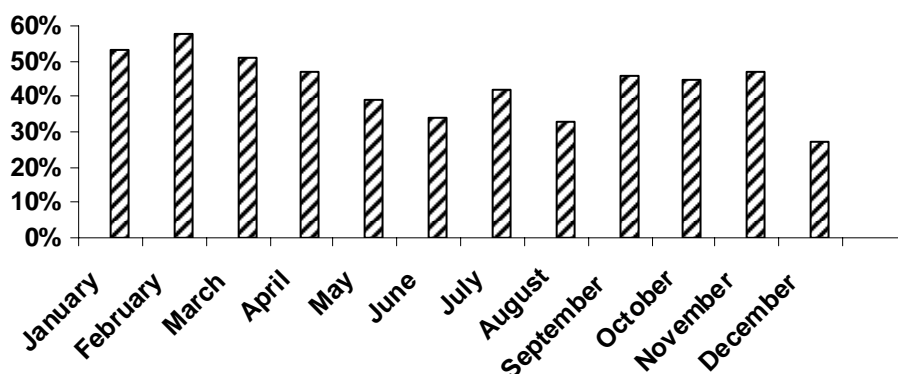
In reply to the question about whether College members should be encouraged to mentor others in their organisations, particularly advising early stage researchers on writing grant proposals, 73% answered yes,

16% no, 10% don't know. Several commented that this should already be happening, another that it was "soul destroying to mentor staff to enter excellent proposals that then do not get funded".

Timetable of College activities

The main College review periods are January and August for Standard Grants, March-April for New Investigators, October for Smalls and December for Fellowships. Since College members often comment they have to complete reviews during particularly busy times, the questionnaire asked members which they considered to be the best times for review periods. No strong preferences emerged, but the most popular months were January to March, with December, June and August the least popular.

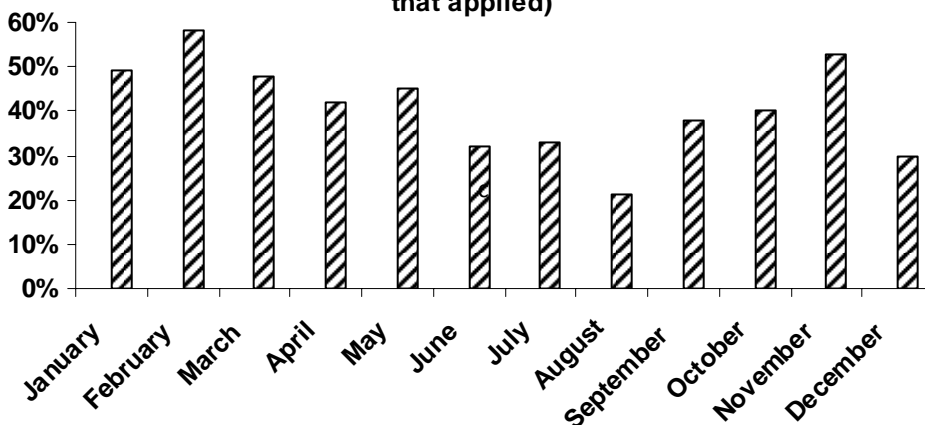
Figure 31: Months College members considered best for review periods (respondents could select all that applied)



Standard Grant meetings are usually held in May and November, New Investigators in June and Small Grants in December, with Fellowship interviews in April. Slightly clearer results emerged from the question asking members what the best times were to attend panel meetings: January to March and November were preferred, with June to August and December the least popular.

Several members said that they would like the workload to be more evenly spread over the year, with more regular meetings, perhaps by having no closing dates or more deadlines a year. There were pleas to avoid meetings during HEI exam/ marking periods and to exclude summer. However, many recognised that all times are busy and individual commitments vary greatly, so the best NERC could do was give as much advance warning as possible of dates, with comments such as "You will never win on this one".

Figure 32: Months College members considered best for panel meetings (respondents could select all that applied)



What would College members like to change?

Members were asked if they could change two things about College membership, what they would be. Of the 156 responses, some were happy with how things are and had no suggestions for improvements, e.g.: "I do not have any negative comments about the administrative and infrastructural support for the college and its members which is excellent". Assuming that those who did not comment had the same view suggests that almost half of members are generally content with the College as it is. However, the suggested changes largely repeated comments in previous sections and fell into the following categories:

Membership: Comments were broadly similar to those in other sections, with requests for more selective recruitment, including inviting more senior and high quality members who will do a good job, with some suggesting all members should have had Standard Grant funding from NERC or equivalent. In contrast, several encouraged wider membership, with suggestions including more “new blood”, women, representatives from industry/ government/ applied researchers and research centres, as well as more generalists and possibly overseas members. Some thought a wider and deeper spread of disciplines was needed, with several specific suggestions. Two wanted a more transparent application and appointment process, one thought all NERC-funded scientists could be automatic members and another suggested cross-RC members. A few respondents suggested an extended term of office, so members do not rotate off just when they are getting comfortable with the process, and to provide more stability and experience.

More inclusion: 10 requested more involvement, particularly in panel meetings, as some had never been invited. There were also some requests for more involvement in development of policy/ strategy/ initiatives and opportunity to comment on general issues affecting NERC policy or performance.

Meeting location: 10% of responses requested meetings not always in Swindon, but places more central/ easily reached, or even by video conferencing. There were requests to set meeting dates much further in advance, to allow busy researchers to participate, to avoid Mondays, and to allow more time for meetings so they are not rushed.

Panel membership/ introducers/ chairs: Again, similar themes were apparent, such as the need for transparency in selection of members/ introducers, ensuring the best members serve and that the whole spectrum of relevant expertise is represented, requiring members to read more proposals to encourage meaningful discussion, and choosing experienced, trained chairs. Although some were in favour of changing membership regularly, more requested greater continuity of membership. There was further support for a pool of chairs/ permanent chairs.

Workload/ timing: Requests included a lower and/or more even workload through the year (perhaps with no closing dates and more frequent meetings) and between College members, with fewer proposals sent out in a short space of time and more time to do reviews. Some wanted to avoid review periods and meetings out of non-term time and/or before Standard Grant closing dates, and more advance notice of review periods.

Networking/ communication: A popular answer was more interaction between College members and with NERC staff, including a voluntary members’ annual meeting/ conference, possibly including discussion of funding policy/ process issues, presentations by funded PIs and extra training. Several requested quicker notification of which applications are funded and more evidence that what they do matters.

Pay: A few members asked for better pay/ reward, especially for panel attendance (although recognising they are rewarding in other ways), a few for payment to their organisation and two, no payment.

Training/ guidance: Some respondents wanted more guidance and/or training for panel members. This should emphasise the great responsibility members have in deciding which applications are funded, both from the viewpoint of the science funded and the careers involved, and that substantiated, constructive criticism is needed. Guidance was requested on the level of detail required in reviews and how to assess proposals when members have low expertise, with more example good and poor reviews provided.

Process: There is discomfort over grading proposals in which members have low expertise and a desire for more transparency in processes in order to give confidence that they are fair. Some would like applicants to be told referees’ grades and if their proposal was borderline. A few perceived that even constructive criticism of good grants could prove fatal and there were concerns about the grading system (“arcane and byzantine set of alpha 1,2,3 etc”), amount of adventurous science funded and assessment of multidisciplinary projects. Requests included ability to nominate people members do not want to review proposals from; fewer proposals rejected at sift; fewer inexperienced staff; and all-electronic peer review, including at panel meetings, with a large room display for the chair to highlight the proposal under discussion.

Recognition: Several members thought that College membership needed increased recognition and status amongst HEIs and RCs, although there they could not suggest a way to achieve this.

Success rate: Some mentioned better success rate for responsive mode, with less funding for themes.

Performance Management: There was support for increased quality control, including discontinuing membership of those who consistently provide inadequate reviews. Several wanted more feedback on their performance in order to improve assessment quality and to know how they compared to others for better self-calibration, perhaps allowing them to see other members' reviews of the same proposals.

Discussion about developing the College

Membership

One of the objectives of this Evaluation was to recommend any changes necessary to improve the performance of the College and extend its use. Potential changes to the way in which members are recruited have been discussed above. These should ensure the appropriate balance of experience and expertise on the College, and clarity and transparency in the recruitment and selection process (Recommendations 1 and 4.1). There is an obvious need for more recognition and status of membership within ROs and RCs; as explained above, the suggested measures will only partially solve this problem but NERC's influence in this area is limited.

The majority seem content with the current three-year term of College membership, but it was usefully suggested that there should be more flexibility, so a larger proportion of members who have performed well should be asked to stay on for a fourth year; this would increase the overall experience and stability of the College and reduce the number of new members who need to be recruited each year (Recommendation 1.2).

The majority of external consultation respondents agreed that College members should be paid, with most members and NERC staff preferring the current annual honorarium. Although a few liked the idea of payment per review/ meeting, the rest did not see any merit in a more complicated system. It also seems that the current contract between NERC and College members helps to ensure the close to 100% reviewer response rate, higher than that obtained by other research councils that do not pay in this way. The level of the honorarium should be reviewed, because it has not been increased since 2003, whereas payments to NERC Board members have recently been increased. Inadequate remuneration did not emerge as a barrier to applications to the College, but some requested higher payment and around 40% of respondents thought that this would encourage applications for membership (although this would not ensure applicants of high calibre). Since some members would like payment to their organisation, department or personal research funds, NERC should investigate whether these options are possible, although current Inland Revenue rules mean that College members have to be treated as employees for tax purposes. Recommendation 5.4 therefore suggests that NERC should discuss the level of the annual honorarium and whether a fixed payment is appropriate.

The majority of College members find the current contractual workload appropriate, but some think it is too high; a more even spread of work through the year and between members, and more time to do reviews, were requested. Some members asked for more involvement, especially in panel meetings, and the need for more parity of workload is supported by the data. It should be noted that the survey carried out by RCUK¹⁰ estimated an average reviewer spent four hours reviewing a conventional proposal and four days preparing for a panel meeting. This suggests that a member attending the maximum of 5 meetings would require 25 days in total. This workload would not be reasonable, so it is proposed in Recommendation 5.2 that members should only exceptionally be asked to attend this many meetings, e.g. if some were smaller meetings. Since many members do not attend any meetings in a particular year, flexibility to convert their meeting quota to extra reviews would also be useful (Recommendation 5.3).

Most of the College are happy with the amount of training they have received, but some asked for more guidance in particular areas, namely the final ranking process, assessing costs of proposals, the level of detail and types of comments required for introducer comments, how to carry out reviews of proposals in which they have low expertise, assessing 'adventurous' and multidisciplinary projects and greater emphasis on the responsibility of members in deciding which applications are funded and how this affects researchers' careers. More examples of 'good' and 'bad' reviews were requested.

¹⁰ DTZ Consulting and Research report for Research Councils UK: Analysis of the External Costs of Peer Review, 2006.

Assessment process

Reducing the proportion of low expertise reviews, and improvements in the processes for sifting proposals, selecting panel members and running meetings, have already been outlined. Of the suggestions posed in the consultation, there was strongest support for instigating a pool of designated panel chairs, who would receive additional training and provide a stronger link between the College and SISB (Recommendation 2.1). There are many details to be agreed regarding how the chairs would operate, for example how many there should be, how they would be selected and trained, whether or not they should be paid extra, how the link with SISB would work, their term of service and expected workload. The pool would need to be large enough to cover all meetings (possibly including research programme panels) and include affiliate members for KE meetings. However, it should not be too big, so that chairs can become engaged with the system at a higher level. Logistical issues, such as needing to have extra College members if chairs do not undertake reviews (and hence increasing the College budget), and ensuring that chairs are available on meeting dates, would also need consideration.

There were also many requests for meetings to be held outside Swindon, in more central and easily-reached locations. NERC should therefore look into the potential cost and feasibility of this (Recommendation 2.10).

There was no consensus about the best times for review periods and panel meetings: members are always busy. However, clearly some months are less suitable than others. The timetabling of grants rounds will always be difficult, because of the number of schemes and closing dates must also be suitable for applicants and external reviewers. However, the move of grants processing to the Shared Services Centre and the new back office computer system will provide an opportunity for NERC to re-assess the timing of its closing dates and consider whether they should be abolished for some schemes (also discussed in the Blue Skies Review, 2006). This may spread College members' workload more evenly through the year and thus allow members time to provide more thorough reviews. The timing of the College year from 1 June to 31 May causes problems because some panel meetings, e.g. for the New Investigator scheme, are held in June when a third of the College consists of new members who have not yet been trained. It is therefore proposed in Recommendation 5.6 that the College year should run from 1 July to 30 June instead.

The need for greater transparency has already been discussed and would address misconceptions obvious from some consultation comments, e.g. that area of science influences funding decisions in responsive mode.

Wider use

It was originally envisaged that the College would have a wider role than assessment of responsive mode proposals. Although some members take part in other activities, such as reviewing KE proposals, and assessment panels for directed programmes and services and facilities, they are not asked for input to funding policy and process development to the same extent as the peer review committees. Members do provide informal feedback, but this is not captured in a consistent way. Almost half of members would like to be involved in wider NERC activities and this may help to improve the status of membership, as well as providing a useful source of advice and a way to gauge the scientific community's views on relevant issues, for example when NERC is considering changes to funding policy or processes, or discussing council remit boundaries. This could be part of the proposed optional annual meeting for members (Recommendation 4.3). There is also an opportunity for links to be formed between College members and the new theme leaders, so that theme leaders become more aware of relevant responsive mode research. However, any perception of an 'inside track' for College members must be avoided. NERC could also encourage members to promote the College and provide useful information to their colleagues, particularly advising early stage researchers (as many already do) and new College members in their departments (Recommendation 5.5).

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