ANNUAL REPORT

2009 COMPETITION

Submitted by

GSC 08 and GSC 09

Solid Earth and Environmental Earth Sciences Grant Selection Committees

April 2009

The numbers and statistics contained in this report do not represent the final and official results of the competition; they are included to help the reader understand the context of the competition. The final and official numbers and statistics are the ones presented to the Committee on Grants and Scholarships (COGS) during their spring meeting following the competition. Note that the numbers and statistics contained in the GSC annual report should not be used for any other purpose than the GSC Annual Report.

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1. OVERVIEW OF COMPETITION

A new review system was implemented by all Grant Selection Committees this year. The review of Discovery Grant applications and the recommendation of grant amounts occurred in two separate steps. In the first, the Committees performed a merit assessment of each application on the basis of the three selection criteria (excellence of the researcher, merit of the proposal, and contribution to the training of HQP). In addition, the Committees determined whether the proposal had normal, lower than normal or higher than normal associated costs of research relative to others in the field. The Committees then voted on a rating for each criterion for each application and the use of the "Dutch Auction" method was perceived as an effective way to extract a reasonable consensus view. In the second step, once all applications had been evaluated and ratings established, the Committees set the amounts to be allocated to applications that had the same rating. The Committees adjusted, within funding bins, for the cost of research. The reviews were based on the information contained in the applications and external reviews; and each application was judged in the context of the collection of proposals evaluated by the Committees in the competition this year.

All criteria were important and had equal weight when determining the bin for the applications. Members were provided with a rating grid and instructions at the Orientation Session that occurred in Ottawa on December 4th 2008.

Members of GSC 08 and GSC 09 collectively established an understanding of how the indicators were best considered for the earth sciences at the business meeting on February 15th 2009. In total, nine applications were reviewed for this "calibration" exercise.

On March 12th 2009 NSERC organized a teleconference with the Chairs of GSC 08-09 and the Group Chair in order to revise the distribution of funds in each funding bin. The reason is that after analyzing the results of the competition, these were not always consistent with the key principles which are:

1. To support excellence in research;
2. To fund applications with similar profiles at a similar level;
3. To recognize that different programs of research may incur different relative costs, where appropriate;
4. To establish discipline-appropriate minimal funding levels allowing the conduct of quality research programs.
5. Notwithstanding point 2, the need to reserve the flexibility to look at individual cases, in particular anomalies, to ensure again that the binning system does not contradict the principle of supporting excellence.

NSERC's analysis revealed that these principles were achieved in the great majority of cases, however, there were a few unintended consequences and/or anomalous cases that needed revision.

Also new this year was the merger of the environmental earth sciences and the solid earth sciences to form the new group called "Geosciences". Throughout the summer and fall, the Program Officers of GSC 08 and GSC 09 formed a group of current and

past GSC 08 and GSC 09 members in order to determine the themes that fall under the "earth sciences" discipline. The group came up with a total of 19 themes which now form the themes that are part of the Geosciences group. Applications were reviewed by theme this year, instead of alphabetically as was done in the past, and members found this new order of review very efficient.

While there are still some issues to be resolved regarding scheduling of applications and members, the new Conference model worked very well. There were several applications that were jointly reviewed between GSC 08 and GSC 09; and some were also jointly reviewed with GSC 18 (Evolution and Ecology).

Brigit Viens served as Program Officer for GSC 09 and Kenn Rankine as Program Officer for GSC 08. The Group Chair Nigel Roulet from McGill University, NSERC Team Leader Dave Bowen and Director Norman Marcotte monitored the review process on an intermittent basis.

2. COMMITTEE COMPOSITION:

GSC 09 was composed of six 3rd-year members (François Courchesne, Jim Christian, Robert Gordon, Alain Royer, Fran Walley and John Wilson), two 2nd-year members (Ali Aksu and Brian Cumming) and five 1st-year members (Diana Allen, Peter Ashmore, Bernhard Mayer, Philip Merilees and Hervé Piegay).

GSC 08 was composed of two 3rd-year members (David Corrigan and Cathy Busby), four 2nd-year members (Robert Linnen, Guy Marquis, Claudia Schröder-Adams, and John Spray) and three 1st-year members (Mark Barley, Alexander Cruden, and Fritz Neuweiler). Two additional, experienced members were brought back to the Committee to serve one year only, and to balance the membership rotation (Michael Bostock and Frank Hawthorne).

The composition of the Committees provided reasonable coverage within the spectrum of Geosciences. The members noted that the breadth of subjects covered by 08/09 challenged the expertise even of 24 members and in these cases, consultation reports from other committees were sought. The external reviews were particularly valuable in those instances as well. Next year, when the new conference model is officially in place, there will be 24 members who will evaluate all "Geosciences" applications.

3. ORIENTATION OF NEW MEMBERS

A face to face meeting in Ottawa occurred on December 4th 2008 for all members of all Grant Selection Committees. The morning session was a general, plenary session for all in order to present the new rating grid, the instructions, and the funding calculator. The afternoon session was specific to GSC 08/09 where Brigit Viens and the Chairs summarized the procedures that are specific to these Committees. The members discussed at length the criteria of evaluation of the applications, the new rating system, and the presentation of an application in order to simulate the competition week in February 2009.

The different types of applications (e.g. first time, senior productive scientists, regular scientists producing adequately) were discussed, as well as how to assess them. The discussion emphasized difficulties that arise in assessing proposals, tips for preparation of notes on each proposal, adherence to the evaluation criteria, and the importance of starting early, and allocating enough time to complete the work. The orientation session also helped new members to understand the philosophy of NSERC and the practical application of this philosophy in the context of reviewing applications.

4. WORKLOAD

The workload in 2009 was less than it was in previous years as only five members participated in the review of each Discovery Grant application compared to seven members as it was in the past. There was a total of 121 Discovery Grant applications in GSC 09 and 102 in GSC 08. For RTIs there was a total of 118 applications for GSC 08 and GSC 09 combined. Six members participated in the review of each RTI application (3 from each GSC). Those members that had a lighter load of Discovery Grant review were assigned as reviewers on either the RTI Lab or the RTI Field applications.

5. REVIEW OF DISCOVERY GRANT APPLICATIONS

The details of the awards are contained within the competition results in Appendix I following this report. At the Chairs Meeting in November 2008, each application was assigned to one of the 19 themes identified for "Geosciences". The themes and number of applications per theme per GSC are identified below.

THEMES FOR GEOSCIENCES:

	GSC 08	GSC 09		GSC 08	GSC 09
Petrology and Mineralogy	12	0	**Paleo-environmental Sciences**	2	12
Sedimentology and Stratigraphy	15	0	**Biogeosciences**	0	23
Paleontology and Paleobiology	11	0	**Global Geological Processes**	4	1
Geophysics	12	0	**Atmospheric Sciences**	0	19
Economic Geology	9	0	**Hydrology**	1	15
Tectonics and Structural Geology	11	0	**Oceanography**	2	10
Geochemistry and Geochronology	11	1	**Soil Sciences**	0	11
Volcanology	2	0	**Geomatics and Earth Systems Observations**	2	8
Planetary Sciences	5	0	**Cryology**	0	10
Surface Processes	3	11	**Total**	**102**	**121**

The budget for GSC 08 and GSC 09 was merged shortly after competition due to policy changes that were introduced after the committees met in February. The statistics are now merged for GSC 08 and 09.

For GSC 09, the success rate for first-time applicants (FN, FNA, FA) decreased from 70% in 2008 to 50% in 2009. The average grant for this category was $19,250 last year and has increased to $22,737 this year.

The average funding level for returning applicants (R$, RF$ and RU) significantly increased this year to $40,989 compared to $26,256 in 2008. The success rate for this category however significantly decreased from 82% last year to 63% this year. The overall average grant for GSC 09 in the 2008 competition was $24,437 and this year has increased to $38,439 and the overall success rate was 74% compared to 61% this year.

For GSC 08, the success rate for first-time applicants (FN, FNA, FA) decreased from 60% in 2008 to 50% in 2009. The average grant for this category was $24,400 last year and has decreased to $22,737 this year.

The average funding level for all returning applicants (R$, RF$, RU, but also including RUN) increased this year to $40,989 compared to $30,522 in 2008. The success rate for this category however significantly decreased from 88% last year to 63% this year. The overall average grant for GSC 08 in the 2008 competition was $29,716 and this year has increased to $38,439 and the overall success rate was 83% compared to 61% this year.

6. DISCOVERY ACCELERATOR SUPPLEMENTS (DAS)

GSC 09 identified 9 applications and GSC 08 identified 7 applications that it judged were most deserving of a nomination for a Discovery Accelerator Supplement. It selected excellent and productive scientists whose research was poised to advance to a higher level, but who were being impeded by lack of adequate resources.

7. VOTING PROCEDURES

GSC 08 and GSC 09 continued to use electronic voting as in recent years, again with handheld PCs and it worked generally well. Use of the “Dutch Auction” method was perceived as an effective way to extract a reasonable consensus view. The switch to a “standard” five-year award limited the number of discussions on the duration of the award. Durations shorter than five years were assigned in exceptional cases only. After competition, NSERC determined that established researchers that had a rating of “moderate” for the merit of the proposal and “strong” for the other two criteria were awarded the level of funding in that bin, but just for a one-year period. Also, applicants with a "moderate" score in excellence of the researcher and “strong” for the other two criteria were not awarded a grant, unless well-justified delays in their research were presented in their application.

8. CONSULTATION AND EXTERNAL REFEREE REPORTS

Consultation reports were requested for some applications for which the Committees’ expertise was limited. Most of these consultations were determined at the Chairs

Meeting in November 2008. In each case, the Chairs identified the key issues to which the consultants from other GSCs were asked to pay particular attention.

The external reviewers reports were all distributed to all members using the GSC Extranet site and this process went relatively well. A few late reviews were also circulated after the first day of the competition.

9. COMMENT LETTERS TO APPLICANTS

A comment was drafted for all cases where the applicant received a "moderate" and/or "insufficient" rating in any of the three criteria, as well as a "low" in the cost of research factor. The Committees continued to use the same approach for drafting comments as in previous years, which worked well. The first draft was written by the first reader, either by hand on an NSERC comment form or sent by e-mail to the Program Officer. An NSERC employee typed each draft for review by others. The members began the review of these draft forms on the 2nd day and encouraged all readers to review the draft forms as they became available. The forms were left on a table at the side of the room to make them easily available. Forms were folded in half and conflicts were identified on the outside of the form to prevent those in conflict from seeing the comments. Subsequent to a review and editing by NSERC, all comments were provided to the Chairs via the Extranet for final approval.

10. RESEARCH TOOLS & INSTRUMENTS

Two subcommittees (field and lab) of six members each were formed to consider the Research Tools and Instruments Grant applications. Fran Walley chaired the RTI Field subcommittee and Bob Linnen chaired the RTI Lab subcommittee.

There were a total of 118 RTI Grant applications, requesting a total of $7,831,094. The success rate was 24.58% (29/118) and the funding rate was 22.28% which translated to $1,745,158 in awards. The review process followed established flat distribution ranking procedures that are clearly explained in the GSC 08-09 RTI Procedures.

Prior to competition week, the members of the subcommittees submitted their ratings to their Program Officer. The overall ranking of the applications were reviewed when the subcommittees met during competition week. The review involved first looking at applications with high standard deviations in rankings. Particular attention was paid to applications that ranked near the 30 to 50% funding thresholds. The need for equipment in the earth sciences is great, especially for lower cost items that are not readily acquired using CFI funds and where the equipment does not fit well into the large laboratory infrastructure proposals that CFI finds attractive.

The final ranked lists from the two subcommittees were blended by selecting awards from each subcommittee – this was based on the funding rate.

11. POLICY MEETING

On the last day of the competition, a policy meeting was held and issues arising from the week's activities were discussed. The 2009 Policy Meeting Minutes can be found in

Appendix II. The Committee members were asked during the policy meeting to recommend replacements for the departing members. A slate of possible candidates will be submitted to the Program Officers shortly.

12. SUMMARY

The Committees felt they had done justice to the pool of applicants, achieving a rational and systematic distribution of funds on the basis of merit. The objective of decoupling the size of a renewed grant from the applicant's previous grant ("lessening inertia") was felt to be a good idea, and the process achieved this outcome. It was acknowledged that the new scoring system, focussing on the results from the current grant for returning applicants (production from past six years) and overall merit of the new proposal, permitted greater potential for movement either up or down the funding scale, which overall is a positive outcome.

There were discussions on the relative value of the three main headings (1- Excellence of Researcher; 2- Merit of Proposal; 3- Training of HQP), with reservations expressed about the possibility that some applications could be funded despite a "moderate" score for (2), if (1) and (3) are "strong". There were suggestions that (1) and (2) should slightly outweigh (3), thus ensuring that training of HQP would be based on 'strong' proposals driven by 'strong' researchers.

Discussions pertaining to proposal evaluations were professional and positive, with goodwill towards the applicants (these being, after all, our colleagues) and a motivation to facilitate their eventual success if the present application was weak. Members needed to be reminded from time to time that accomplishments of the distant past (such as for example an outstanding HQP contribution) do not weight in the assessment of the present proposal (so that a new application that appeared not to offer much potential for HQP, for example, could not be rated outstanding on that axis, no matter how strong the past record).

In terms of the experience of Committee members, the reduction to 5 reviewers meant less time in the room together and perhaps a slightly less "social" experience, but on the other hand the circulation of members from other Committees broadened things in a compensating way.

Appendix 1

GSC 8 and 9 **Earth Sciences**

Discovery Grant Statistics	Totals
Number of Applications:	**223**
Number of Awards:	**136**
Success Rate:	**61%**
Average Grant:	**$38,439**
Funding:	**$5,227,665**

Equipment Statistics	
Number of Awards	29
Success Rate	24.58%
Funding Rate	22.28%

ER and ECR	ER	ECR
Number of Applications:	191	32
Number of Awards:	120	16
Success Rate:	62.8%	50%
Average Grant:	$50,266	$20,062

First Time Applicants (FTAs)	Totals	FN	FA	FNA
Number of Applications:	**38**	23	10	5
Number of Awards:	**19**	13	3	3
Success Rate:	**50%**	57%	30%	60%
% of Budget:	**8%**	5%	1%	2%
Average Grant:	**$22,737**	$20,692	$24,000	$30,333
Funding:	**$432,000**	$269,000	$72,000	$91,000

Returning	Totals	R$	RF$	RUN	RU
Number of Applicants:	**185**	101	42	9	33
Number of Awards:	**117**	77	33	3	4
Success Rate:	**63%**	76%	79%	33%	12%
% of Budget:	**91.74%**	67.76%	21.53%	0.99%	1%
Average Grant:	**$40,989**	$46,003	$34,104	$17,333	$19,006
Funding:	**$4,795,665**	$3,542,201	$1,125,440	$52,000	$76,024

Groups	Totals
Number of RGPGP	**4**
New Groups	0
Renewal Groups	4
Funded Renewal Groups	2
Total Groups Funded	2

Appendix II

Minutes of the Policy Meeting
GSC 08/09

The policy meeting was fairly brief as it took longer than anticipated to balance the budgets.

Rating system:

Overall, members appreciated the new rating system. The 6-point rating scale and the instructions were clear and useful. The majority of the members agreed that equal weighting for all three criteria was preferred, however, some did mention that more emphasis should be put on the merit of the proposal than the other two criteria.

The main issue discussed with regards to the rating system was HQP. Some felt that early career researchers, adjunct and emeritus professors, as well as small universities, were somewhat "penalized" with this new system. The proper weighting of undergraduate supervision and co-supervision is also perceived by some as ambiguous – opportunities and policies for undergrad supervision are all over the map.

GSC Structure:

Members greatly appreciated the new conference model adopted by GSC 08/09 this year. Although there were some scheduling challenges, members felt that the input from a member of another GSC was useful and should definitely be continued. However, one criticism of this new structure is that the GSC dynamic is very different since only very few members, sometimes only the five readers, were in the meeting room at any given time.

In the future, "dead-times" should be built into the schedule in order to deal with delays. Also, it was suggested that next year, the 1st and 2nd internal readers should perhaps spend less time restating an itemized list of the proposal contents, but rather focus on the set of criteria that justified attributing a certain score. This would leave more time for the 3rd, 4th and 5th readers to add any comments (if necessary) and allow wrap-up time for discussing potential points of contention within the15 minutes allotted time. If both 1st and 2nd internals are in agreement, then the discussion could be minimized if the other readers agree as well.

External Referee Reports:

It was suggested that the instructions to external reviewers be updated to reflect the new rating system. It was also mentioned that external reviewers should not be asked to provide their comments and rating for each criterion and that they should focus on the excellence of the researcher and the merit of the proposal.

Membership:

Membership was discussed briefly and members were encouraged to provide their suggestions for possible replacements to NSERC shortly.