ANNUAL REPORT

2008 COMPETITION

GSC 08

Solid Earth Sciences
Grant Selection Committee

April 2008

The numbers and statistics contained in the 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 those 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.

MEMBERSHIP OF THE SOLID-EARTH SCIENCES GRANT-SELECTION COMMITTEE – GSC 08

Chair (2007-08)
Dr. Brendan Murphy
Department of Earth Sciences
St. Francis Xavier University

Committee Members
Dr. Cathy Busby
Department of Geological Sciences
University of California – Santa Barbara

Dr. Melvyn Best
BEMEX Consulting International
Victoria, BC

Dr. Paul Copper
Department of Earth Sciences
Laurentian University

Dr. David Corrigan
Geological Survey of Canada
Ottawa, ON

Dr. Robert Linnen
Department of Earth Sciences
University of Waterloo

Dr. Guy Marquis
CanAlaska Uranium Ltd.
Vancouver, BC

Dr. Edward Sawyer
Sciences Appliquées
Université du Québec à Chicoutimi

Dr. Douglas Schmitt
Department of Physics
University of Alberta

Dr. Claudia Schröder-Adams
Department of Earth Sciences
Carleton University

Dr. John Spray
Department of Geology
University of New Brunswick

Group Chair (2006-09)
Dr. Warwick Vincent
Dépt de Biologie
Université Laval

Program Officer
Kenn Rankine
NSERC, Ottawa

Committee membership

Four new members joined the Solid Earth Sciences Grant Selection Committee (GSC 08) this year: Dr. Guy Marquis, Dr. Robert Linnen, Dr. Claudia Schröder-Adams and Dr. John Spray. The new members blended with remaining Committee members very easily, and maintained the strong tradition of team work. The Committee functioned well and efficiently throughout the competition week, finishing on-time and on-budget. Five committee members retire at the end of this year (Best, Copper, Murphy, Sawyer, and Schmitt), so acquiring the optimum blend of expertise and team-players will be of utmost importance.

The 2007-08 Committee had sufficient breadth of expertise to cover almost all of this year's applications without difficulty. A reader/non-reader system was used again, with 7 readers per application. The number of readers on French applications was maintained at 7 as well, with 8 of 11 Committee members able to review applications in French. However, in order to maintain the capability to assign 7 readers for applications in French, at least three of the five new Committee members for next year's competition should be fluent in French.

Fall orientation

For the third year, the orientation meeting for new members was held by teleconference rather than in person. The teleconference was held on Wednesday, December 5th, 1:00-4:00 EST with the Program Officer, the GSC Chair, and new members for GSC 08. Some members were able to participate via a videolink, but some (including the Chair) participated via a standard telephone conference call. Although St. FX does have a state-of-the-art videolink system, it does not interface with NSERC's system. All participants agreed that the availability of a videolink was "nice", but not essential.

In advance of the meeting, an electronic copy of a PowerPoint file to be presented at the orientation meeting was posted on the Extranet. The presentation followed the same general format as in previous years, using the outlines provided by NSERC to the new members. The Program Officer initially explained general NSERC structure and policies. The Chair provided details of the review processes and normal procedures during competition week. Special emphasis was given to the review process itself because at the time of the teleconference in December, Committee members had already received their individual reading assignments. The Chair did a mock review of an application from the 2007 competition (approval from the applicant was requested and granted). This exercise was greatly appreciated and helped new Committee members organize their internal reviewer presentations before the competition meeting. However, at the post-competition meeting, the new members maintained that the mock review process went too quickly, and I recommend that the text of the mock review be posted on the extranet in advance of next year's orientation session.

It was agreed that the orientation session was extremely useful. The video(tele)conference format worked well, especially given that there were 4 new members joining the

Committee. Based on these experiences, I see no need to revert to the face-to-face meetings in Ottawa, unless the committee structure changes to a conference format.

Council of Chairs of Canadian Earth Science Departments (CCCESD)

My communications with the Council of Chairs of Canadian Earth Science Departments (CCCESD) revealed a remarkable ignorance within the Earth Science community (including at the Chair level) as to how NSERC GSCs obtain and retain their funding. For example, many Earth Science department Chairs did not know that the grant money of those who do not reapply to NSERC gets redistributed among all NSERC GSCs. Nor did the Chairs know that RTI funding is profoundly influenced by the requested amounts of applications a Committee receives. Clearly, more dialogue between NSERC and the CCCESD is needed. I proposed to the Chair of CCCESD that the Chairs of GSCs 08 and 09 should be invited to attend their meetings either in person or by teleconference.

Chairs meeting

The Chairs' Meeting took place on Saturday, November 25th 2007, and went smoothly with no particular problems for GSC 08. In addition to myself, at the suggestion of the Program Officer, Dr. Schröder-Adams attended. Her assistance and advice were invaluable. Eight applications were transferred into GSC 08 of which five were from GSC 09 (Environmental Earth Sciences) and three were from GSC 18 (Evolution and Ecology), making a total of 138 applications. In each case where an application was transferred to GSC 08, I requested a formal consultation from the transferring committee. Several consultations were requested (and provided) from GSC 08 to other committees (e.g., GSCs 09, 18). As in previous years, transfers included paleontology and planetary science applications. In both of these areas, GSC 08 Committee members agree that the expertise to evaluate these interdisciplinary and cross-disciplinary applications resides in GSC 08. It was apparent during discussions at the Chairs' meeting that GSC 18 does not have the expertise within their Committee to cover paleontology applications. During the past years, these applications have been systematically transferred to GSC 08. Special care should be taken to ensure that GSC 08 Committee membership covers these two interdisciplinary fields. Dr. Schröder-Adams's background in paleontology was very helpful in evaluating the suitability of applications in the field of paleontology for transfer into GSC 08. I suggest that she be invited to participate in the 2008 Chairs' meeting.

Subcommittees

Three GSC subcommittees were formed this year: a Research Tools and Instruments (RTI) sub-committee, chaired by Dr. David Corrigan; a Membership sub-committee, chaired by Dr. Doug Schmitt; and a joint sub-committee with members of GSC 09 to evaluate MRS applications with relevance to the Earth Sciences.

As in previous years, the five member RTI sub-committee met on the last morning of competition week. Members had individually ranked the RTI applications in order of merit prior to competition week. The Program Officer provided all sub-committee members with a numerically ordered ranking of the RTI applications based on the arithmetic means of the

individual rankings from each member of the GSC 08 subcommittee. During the RTI sub-committee meeting, members evaluated the numerical ranking determined before the meeting, through deliberations based on the NSERC criteria (special attention was given to the scores with a high standard deviation). Eleven of the 46 applications received were recommended for funding (i.e. a 23.9% success rate), with a funding level of $1,087,230 awarded and a funding rate of about 34%.

The Membership subcommittee had a lot of work to do this year, with 5 Committee members to replace. A list of candidates was drawn based on NSERC membership criteria such as area of expertise, gender, geographical representation, language and sector (academia, government or private industry). A review of research subject codes of ongoing Committee members helped identify disciplines that will be under-represented due to the departure of Drs. Best, Copper, Murphy, Sawyer, and Schmitt. It is recommended that 3 new members be recruited with bilingual capabilities; another possibility is to recruit a GSC 08 alumna-alumnus for a one-year term. Two members (Busby, Corrigan) are scheduled to retire from the Committee in 2009, and this strategy would level out the membership renewals for the foreseeable future.

A GSC 08/09 subcommittee was also formed this year to evaluate Major Resources Support (MRS) applications. This year the subcommittee was chaired by Dr. Cheryl McKenna Neuman, a member of GSC 09. The format of this committee seemed to be the same as in previous years, despite strong reservations expressed about the workload and availability of the appropriate expertise by the previous years' subcommittee. At the policy meeting following the GSC 08 2007 competition, it was suggested that members of the MRS subcommittee be selected independently from GSC 08 committee members and according to specific criteria, slightly different than criteria for selecting Discovery Grant committee members, such as having hands on knowledge of equipment and experience in managing research laboratories. This recommendation was included in the Chair's report of 2007 by Dr. Donna Kirkwood and has not been acted upon.

Competition Week

One hundred and thirty-eight applications were evaluated during competition week, the highest number since the splitting of Earth Sciences into Solid Earth (GSC 08) and Environmental Earth (GSC 09) Sciences. For the second year in succession, a memo was sent to all GSC committee members this year regarding the funding amount; NSERC considers $15K as a minimum grant to ensure training of HQP. However, this policy is not articulated in any NSERC documents that would have been available to applicants, and so they would have been unaware of this policy when they submitted their applications. This lack of communication with applicants is a serious oversight that should be remedied in time for the next competition.

There was one major change in procedures in this year's competition. Taking into account some of the complaints of previous years (i.e. not having enough time during the week to work on comments and not having enough actual "down-time") and with the added pressure of 138 applications, the number of readers per application was reduced to 7 Committee members (from eight), including the 1st and 2nd internals. This measure allowed

the deliberations to run smoothly since Committee members had regular breaks during the day. This was appreciated by all and did not affect the level of in-depth discussions for each application. All seven readers voted on an application with the median vote (4th highest of seven votes) being selected as the recommended award amount.

This year's pre-competition meeting went quite smoothly. Many of the items on the agenda had already been discussed during the orientation teleconference and served as a refresher for the returning members of the Committee. The Program Officer reminded the committee about the voting procedures. In contrast to previous years, the Program Officer announced that the 1st and 2nd internals were not constrained by their mini-budgets during the voting process. The Chair advised the Committee that they should not recalibrate their mini-budgets during the competition as the whole budgeting exercise may be compromised.

We agreed on policies such as the typical length of the grants recommended being of five years. We also agreed that we could recommend (i) a one-year grant to above-average applicants who submitted a sub-standard proposal, but otherwise had good records in publications, HQP training, and need for funds, and (ii) a three-year grant to applicants who wrote a good proposal, but had a sub-standard record in either publications or HQP training.

The Committee also discussed the number of years of funding for first-time applicants (FTAs). NSERC guidelines strongly suggest that FTAs receive 5-year grants. Due to the low amount available in the budget for the FTA pool, previous GSC 08 Committees (up to 2006) had agreed upon recommending 3-year grants to FTAs. The assumption was that FTAs returning to the competition after 3 years would be in a stronger position to secure higher funding. The 2007 Committee concluded, however, that the assumptions underpinning that argument, i.e. that the funding of Discovery Grants would improve over time, proved to be fallacious. In addition, we found that many FTAs did not have time to develop their research program, for a number of reasons (e.g. setting up research laboratories or heavy teaching loads). It was decided during the pre-competition meeting to follow the practice of the 2007 Competition, i.e. that 5-year grants would be recommended to FTAs, as per NSERC guidelines.

Establishing these benchmarks during the pre-competition meeting was important for ensuring consistency over the duration of the competition. Following a general briefing on the procedures and a refresher on the four key criteria used to evaluate the Discovery Grant applications, the competition began with eight applications in which (i) there were no conflicts of interest, and (ii) the 1st and 2nd internal readers were "veteran" members of the Committee. The new members expressed their appreciation for this procedure, stating that it helped them organize their own presentations. After these eight applications, FTAs were reviewed, followed by University Faculty Award (UFA) applicants, and then by returning applicants. Deliberations stayed on schedule throughout competition week, and there was a general consensus that the average 15 minutes allotted per applicant was enough to do justice to each application.

There were five full days of deliberation (9 am Sunday, February 3rd to 6 pm Thursday, February 7th). On Monday to Thursday morning, the meetings commenced at 8 am. Friday morning was dedicated to the deliberations of the RTI, MRS and Membership sub-committees. On Friday afternoon, the GSC 08 Discovery Grant budget was balanced, and membership and policy issues were discussed. In parallel with these activities, throughout the week, Committee members prepared comments to applicants whose funding was reduced or terminated, and to applicants who received funding for less than five years. The lions' share of this work was done between 8 am and 8:30 am each morning.

Budgets

The 2008 competition was the first competition after the end of the cycle of Reallocations Exercises that adversely affected previous GSC 08 Discovery Grant competitions. The adverse effects of the Reallocations Exercise persist, as those funds are "permanently" transferred away from Solid Earth Sciences. In addition, the allotment of field units, (a supplement to Discovery Grants intended to ameliorate some of the high costs of field work) was also terminated.

As in previous years, there was a separate budget for FTAs. Initially, the new applicants' budget provided $13,500 per new applicant. The total budget available for the renewal of Discovery Grants (DG) was initially based on a funding decrease of 7% of the amount of returning grants. This decrease was absorbed by taxing each Committee member's mini-budget by 7%. However, a few days before the start of the competition, most of this tax was returned, and there was a net funding decrease of 1% from the levels previously held by returning grantees. This tax rebate made an enormous difference to the mini-budget calculations of each Committee member.

This was the second year of the Discovery Accelerator Supplements (DAS) which are intended to provide additional resources to accelerate progress and maximize the impact of outstanding research programs. These supplements are valued at $120,000 over three years and may be used to expand the recipient's research group (i.e., students, postdoctoral fellows, technicians), to purchase or to have access to specialized equipment, or for other initiatives/resources that would maximize the impact of their research program. NSERC guidelines stipulate that potential recipients should have been recommended for a substantial increase in funding at the time of renewal of their Discovery Grant (at least $5,000), or have received a Discovery Grant for the first time at a level that is above the average for their peer group; have a well-established research program; and be at a key point in their career at which they can make, or capitalize on, a significant breakthrough in their research area, but are presently held back because of insufficient funds.

The GSC 08 Committee was given a quota of 14 DAS nominations, up from a quota of 3 nominations in the 2007 competition. Each GSC 08 Committee member was asked to recommend 2 of their internal applications for a DAS. The final recommendations were discussed by the Committee at the end of the competition. The GSC 08 recommendations were forwarded onto one of four multi-disciplinary Committees for final recommendations to

NSERC, with the probability of a 50% success rate. These Committees will meet through April and May 2008.

The budget procedures adopted this year were essentially unchanged from the previous years. The "mini-budget" method of allocation was used and there was a consensus that this procedure worked well. The fact that the first and second internal readers were not constrained by their mini-budgets during voting, did not distort the overall budget of the Committee.

Discussions with GSC 08 members this year again highlighted the general lack of funding for new applicants. Although the time spent on reviewing the applications and on deliberating during competition week is necessary to ensure the high level of scientific input and fairness in the final decisions, there remains the underlying fact that we are spending significant amounts of time debating over relatively small amounts of money.

GSC08 Policy meetings with NSERC Vice-President Isabelle Blain (Tuesday) and with Group Chair Dr. Warwick Vincent (Friday)

Several subjects were discussed during the policy meetings with the Dr. Isabelle Blain, Vice-President, Research Grants and Scholarships Directorate, and Dr. Warwick Vincent, Group Chair 08/09/18/21.

1) The International Review of the Discovery Grants Program undertaken as part of the review of the federal granting Councils. Dr. Blain stated that she was impressed with the quality of the review Committee, and awaits their final report, which should be received within a few weeks. The Committee got the impression that NSERC policy development is in a holding pattern until this report is received.

2) As in previous years, a plan for a different Committee structure, the conference structure, was discussed. In 2007, it was pointed out that the number of applications in the GSC 09 committee has grown considerably (in 2007, there were 155 applications) whereas GSC 08 has had an approximately constant number of about 100 applications each year between 2000 and 2007. In 2008, the situation was reversed, with GSC 09 having about 125 applications, and GSC 08 having 138 applications. The "conference model" for evaluating grant proposals is touted as a means of levelling out the workloads for both Committees. A certain number of applications could be reviewed by either one of the GSC 08 and GSC 09 Committee members. This model has been applied successfully since the 2006 competition by GSC 18 (Evolution and Ecology). The idea is to combine the expertise of GSC 08 and GSC 09 Committee members to evaluate applications submitted to one of these two Committees. During competition week a combination of plenary and concurrent sessions would be used to draw the best possible subset of readers form both Committees to evaluate an application. A draft document showing a preliminary division of the Solid Earth Sciences into sub-disciplines that could be used as a template to launch a conference model was supplied by NSERC, and this document has been modified by GSC 08, with Dr. Ed Sawyer as coordinator, and submitted to the Program Officer. If adopted,

this document should undergo annual reassessment by GSC 08 Committee members, with a veteran member appointed to coordinate it.

3) During the policy meeting at the end of competition week, the general consensus expressed by GSC 08 members was that the current structure suited GSC 08; the group dynamic is healthy and positive and we felt confident that we could continue to judge the range of Earth Science assigned to GSC 08. Nobody complained of the increased workload brought about by the record number of applications. There was a unanimous feeling that workload considerations are trumped by having a structure that is fair to the applicant, and that the current structure is a fair one. In addition, we felt that our current system of dealing with applications in alphabetical order, rather than in thematic groups, ensured intra-disciplinary consistency. We agreed that the conference model may be suitable for other committees, but we concluded that we could not see how a conference model would enhance the fair evaluations of applications in the Solid Earth Sciences. If NSERC wishes to have a more fluid approach to Discovery Grant competitions, we believe that they should exercise reciprocal fluidity in their governance to allow Committees to function in the way they see best.

4) In previous years, concerns were expressed by NSERC officers concerning the high success rate, low average grant of the Discovery Grants program and the challenge of supporting the best at an international level. GSC 08 members are of the opinion that the high "success rate" is more apparent than real. We are also concerned that this simple message is not being heard at a high enough level and is placing needless pressure on GSCs. The Discovery Grant program is very competitive, and many university researchers decide not to apply if they judge that their dossier cannot compete with their colleagues. Only researchers who consider that they might have a chance of success in the Discovery Grant competition apply, and so a more meaningful expression of the success rate is the percentage of academics funded compared to the total pool of academics that are eligible to be funded. In addition, NSERC should not overlook the implications of such a policy on the balance and demographic distribution of HQP opportunities in Canadian universities.

Results

Budget figures presented by the Program Officer on the final day of the competition showed that GSC 08 was about $60,000 underspent. FTA's (including RUNs) had a 66.7% success rate (20 of 30 applications were recommended for funding). The Committee unanimously agreed to assign the $60,000 to the FTA's (including RUNs), bringing their average grant very close to 70% of the GSC 08 overall average grant of $33,062, which is consistent with NSERC guidelines. The end result of this assignment is that the minimum grant recommended for NEW applicants (FTAs + RUNs) was $18,000, and the average grant was $23,050.

Returning applicants (not including RUNs or RUs) had a success rate of 92.9% (92 out of 99 applications were recommended for funding). The average grant to successful returning applicants (not including RUNs or RUs) was $31,382. Further details of the final results are given in the attached appendices.

More generally, the results confirmed the merit of the mini-budget system, and the adherence to the committee to their mini-budgets and to the pleas from the Chair that they should not recalibrate their mini-budgets during the competition.

Concluding comments

I was fortunate as Chair of the 2008 GSC 08 Committee to be able to work with an exceptional team again this year. The Committee benefited from not only an excellent mix of expertise, but more importantly, an exquisite blend of personal competencies and effective behaviors; the most important of which are commitment to the scientific community, trust and respect between Committee members and an open mind for innovation and non-traditional pathways. I would like to express my gratitude to my colleagues Drs. Melvyn Best, Cathy Busby, David Corrigan, Paul Copper, Bob Linnen, Guy Marquis, Edward Sawyer, Claudia Schröder-Adams, Douglas Schmitt, and John Spray for making my task as Chair, to be a pleasurable experience. I would also like to thank my colleagues of previous years Drs. Aphrodite Indares and Robin Renaud (retired in 2006) and Drs. Frank Fueten, Donna Kirkwood, Jim Mortensen, and Iain Samson (retired 2007) for bequeathing a very healthy Committee culture and dynamic that I hope continues for the foreseeable future.

Needless to say that behind the scientific expertise of the Committee members is a tremendous group of highly dedicated and motivated staff members at NSERC. Sincere thanks go out to Kenn Rankine, NSERC Program Officer, who through his efficient and dedicated work consistently ironed out all the slight problems that occurred throughout the competition and patiently guided the Chair during competition week. I would also like to thank Dave Bowen, NSERC Team Leader and Norman Marcotte, NSERC Director, Physics, Environment and Operations Division, for their support. I am grateful to Dr. Warwick Vincent, the Group Chair, for providing some very timely advice on important macro-issues during Committee deliberations, and some interesting insights on his view of the Discovery Grants program for the coming years. In addition, the advice of NSERC personnel and the Group Chair at key points in our deliberations proved invaluable and timely. I share the convictions of the previous Chair that GSC 08 can rely on Warwick Vincent as a dedicated spokesman for the Earth Sciences at NSERC.

Although the competition was conducted under fiscal constraints again this year, as a Committee we are optimistic that the International Review of the Discovery Grants Program presently underway will benefit research in Earth Sciences and will result in future increases in funding to the discipline.

GSC 8	Solid Earth Sciences	2008

Note – These are unofficial data. Statistics presented at the spring 2008 COGS meeting supersede those shown here.

Discovery Grant Statistics	Totals
Number of Applications:	**138**
Number of Awards:	**114**
Success Rate:	**83%**
% of Overall Avg. Grant ($33062.0	**90%**
Average Grant:	**$29,716**
Funding:	**$3,387,664**

Equipment Statistics	
Number of Applications:	46
Number of Awards:	11
Success Rate:	23.9%
Total Requested $	$3,195,573
Total Awarded $	$1,087,230
Funding Rate:	34.0%

First Time Applicants (FTAs)	Totals	FN	FA	FNA
Number of Applications:	**25**	13	9	3
Number of Awards:	**15**	8	5	2
Success Rate:	**60%**	62%	56%	67%
% of Overall Avg. Grant ($33062.0	**74%**	75%	77%	62%
% of Budget:	**11%**	**6%**	**4%**	**1%**
Average Grant:	**$24,400**	$24,750	$25,400	$20,500
Funding:	**$366,000**	$198,000	$127,000	$41,000

Returning	Totals	R$	RF$	RUN	RU
Number of Applicants:	**113**	71	28	5	9
Number of Awards:	**99**	64	28	5	2
Success Rate:	**88%**	90%	100%	100%	22%
% of Overall Avg. Grant ($33062.0	**92.32%**	101.53%	79.81%	57.47%	60%
% of Budget:	**89.20%**	63.42%	21.81%	2.80%	1%
Average Grant:	**$30,522**	$33,568	$26,386	$19,000	$19,750
Funding:	**$3,021,664**	$2,148,364	$738,800	$95,000	$39,500

Acronyms (from Peer Review Manual)	
FN:	First-time new applicant
RUN:	Returning unsuccessful FTA
FA:	First-time experienced academic applicant
FNA:	First-time experienced non-academic applicant
RF$:	First-time renewal applicant
R$:	Second or more renewal applicant
RU:	Returning unsuccessful applicant

Groups	Totals
Number of RGPGP	**2**
FTA Groups	0
Funded FTA Groups	0
Renewal Groups	2
Funded Renewal Groups	1
Total Groups Funded	1

Figure 1

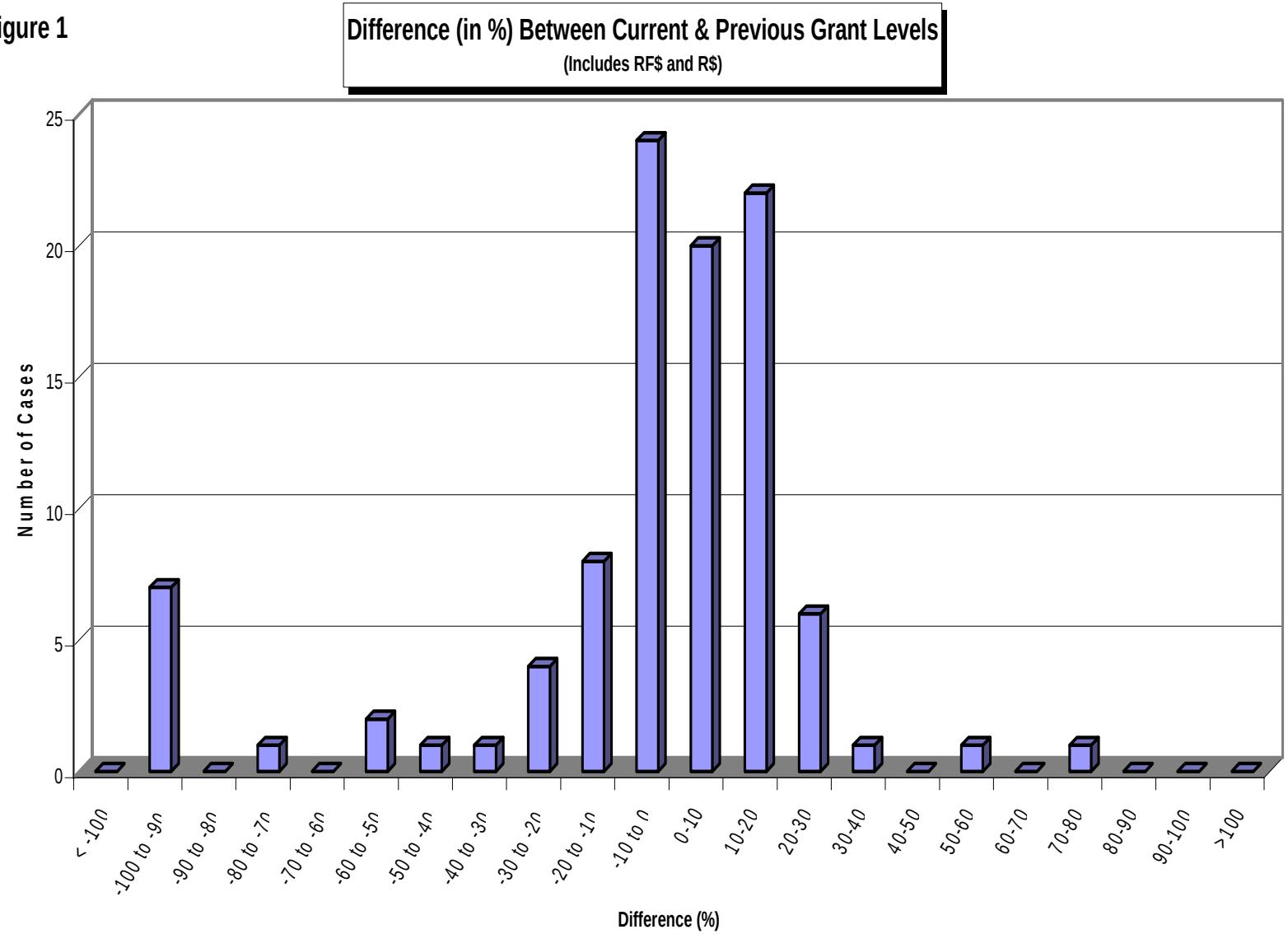

Difference (in %) Between Current & Previous Grant Levels
(Includes RF$ and R$)
Number of Cases
25
20
15
10
5
0
< -100
-100 to -90
-90 to -80
-80 to -70
-70 to -60
-60 to -50
-50 to -40
-40 to -30
-30 to -20
-20 to -10
-10 to 0
0-10
10-20
20-30
30-40
40-50
50-60
60-70
70-80
80-90
90-100
>100
Difference (%)

Figure 2

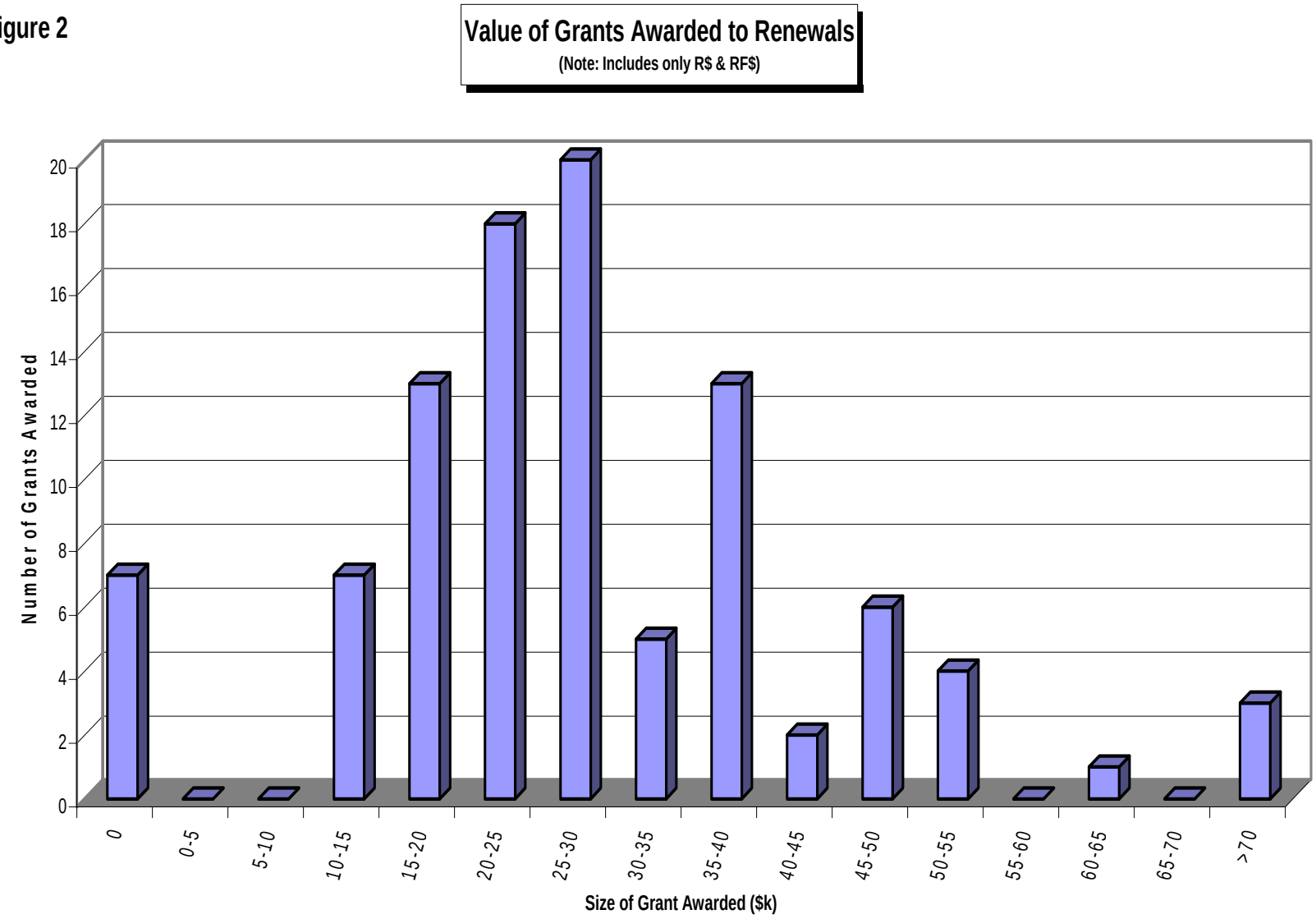
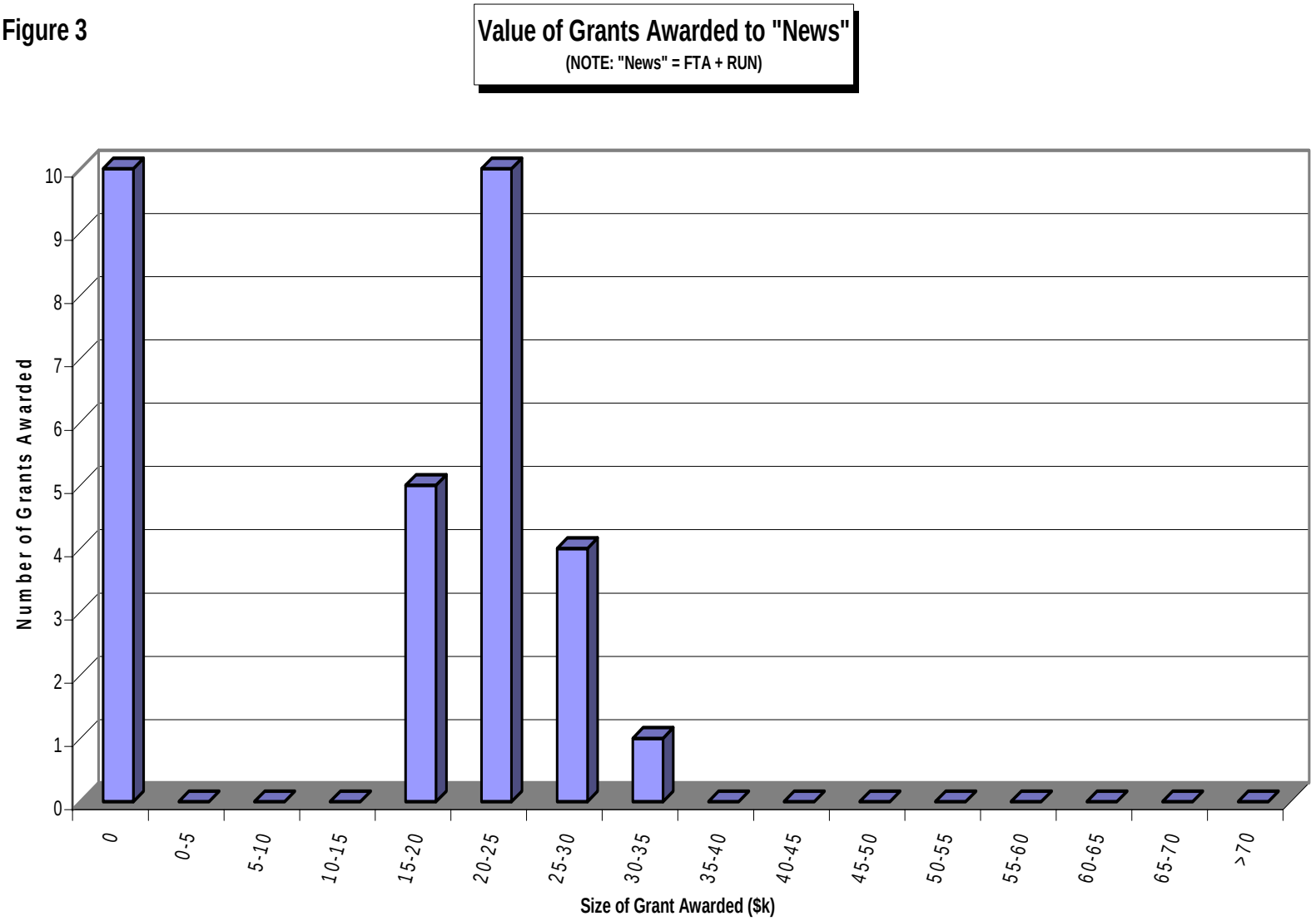

Value of Grants Awarded to Renewals
(Note: Includes only R$ & RF$)
Number of Grants Awarded
0
2
4
6
8
10
12
14
16
18
20
0
0-5
5-10
10-15
15-20
20-25
25-30
30-35
35-40
40-45
45-50
50-55
55-60
60-65
65-70
>70
Size of Grant Awarded ($k)

Figure 3


Value of Grants Awarded to "News"
(NOTE: "News" = FTA + RUN)
Number of Grants Awarded
0
1
2
3
4
5
6
7
8
9
10
0
0-5
5-10
10-15
15-20
20-25
25-30
30-35
35-40
40-45
45-50
50-55
55-60
60-65
65-70
>70
Size of Grant Awarded ($k)