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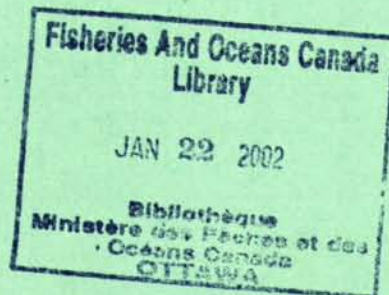
Department of Fisheries and Oceans
Internal Science Advisory Committee (ISAC)
Report to National Science Directors

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Canadian Manuscript Report of
Fisheries and Aquatic Sciences 2582

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Pêches
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Canadian Manuscript Report of Fisheries and Aquatic Sciences

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By

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Abstract

This internal report, requested by the ADM Science in June 2000, provides 35 recommendations to Department of Fisheries and Oceans (DFO) that will help alleviate the low morale found in all regions, improve the quality of science currently being practiced within the Department and reduce the loss of highly-skilled and motivated staff to external agencies. The recommendations include the need for the Department to restate its commitment to science, to clarify its priorities and funding of science programs, to rejuvenate its scientific personnel and to make some changes in organizational structure.

Résumé

Le présent rapport interne, commandé par le SMA des Sciences en juin 2000, présente au ministère des Pêches et des Océans (MPO) 35 recommandations qui contribueront à remonter le faible moral constaté dans toutes les régions, à améliorer la qualité des travaux scientifiques effectués au sein du Ministère et à réduire la perte d'employés motivés et hautement qualifiés au profit d'organismes extérieurs. Il est notamment soulevé la nécessité pour le MPO de réitérer son engagement envers la science, de clarifier ses priorités et ses affectations financières aux programmes scientifiques, de rajeunir son personnel scientifique et d'apporter des changements à la structure organisationnelle.

**Department of Fisheries and Oceans
Internal Science Advisory Committee (ISAC)
Report to National Science Directors**

Executive Summary

This internal report, requested by the ADM Science in June 2000, provides 35 recommendations to Department of Fisheries and Oceans (DFO) that will help alleviate the low morale found in all regions, improve the quality of science currently being practiced within the Department and reduce the loss of highly-skilled and motivated staff to external agencies. The recommendations include the need for the Department to restate its commitment to science, to clarify its priorities and funding of science programs, to rejuvenate its scientific personnel and to make some changes in organizational structure.

1. Objective

The objective of this report is to encourage the retention of scientific expertise within DFO Science and foster a work environment capable of attracting the best scientific personnel in a rejuvenation program. The intent of this report is not to garner undeserved resources or to create an elite institution, but to ensure that the best possible science is conducted within DFO to deal with the exceedingly complex issues in the marine and freshwater environments. It is evident that renewal of scientific programs and staff rejuvenation is crucial to the future competency within DFO Science and that the problem is not new. For example, in 1987, apparently the same problems were sufficiently acute to warrant creation of an Interdepartmental Committee on Revitalization of the Scientific Community. Currently, DFO research facilities are inadequate and understaffed, therefore, to conduct good quality research and attract qualified personnel we need to take immediate action to upgrade facilities and scientific programs to provide an excellent scientific work environment.

The problems described in this report are not unique nor confined to DFO but are evident in science organizations throughout the world. One example is the recent review of government science for the US Environmental Protection Agency (EPA):
<http://www.nap.edu/openbook/0309071275/html/1.html>.

2. Commitment to Science

Recent actions by the Federal Government in the management of science have created an atmosphere of puzzlement, uncertainty and scepticism about the Government's commitment to continuation of its internal science programs. A disproportionate share of new federal spending on fisheries and aquatic science goes to support research by non-government agencies (e.g., universities, contractors, industry) while internal science budgets and staff complements have shrunk. Examples include the establishment, in the

last national budget, of the Canadian Foundation for Climate and Atmospheric Sciences through which Environment Canada will fund research and modeling in this topic area outside government science, the National Research Council administered Industrial Research Assistance Program (IRAP) that provides federal financing of research by private industry, the establishment of "Millenium chairs" at Canadian universities, the growth of the Natural Sciences and Engineering Research Council's (NSERC) budget and the National Centres of Excellence (NCE) Aquanet. Similarly, some DFO scientists are supported entirely by outside funding from agencies such as the Panel on Energy Research and Development (PERD) to work for outside organizations on projects, which are not necessarily departmental priorities.

As laudable as these initiatives are, they are in sharp contrast to most of the Department's traditional core programs, which are severely under-funded and understaffed and no longer have the capacity to fulfil their undiminished mandate (discussed in detail later). The message perceived by DFO Science staff is that the federal government does not value in-house government science, that it believes outsiders can do the research better than its own scientists and that government departments including DFO do not wish to retain strong government science programs.

Those in DFO science programs believe, for reasons in addition to those of self interest, that there is a clear need for in-house government science programs. Paramount among these reasons is the fact that universities and industries are rarely interested in or capable of conducting the long-term research and monitoring required to support the Department's mandate. Thus, in-house government science programs need to be adequately supported to conduct the required research.

The staff in DFO science need a leadership statement and definitive actions that will clarify the degree to which DFO intends to conduct its science activities in house and in what areas it intends universities and industry to lead. This statement should express the Department's particular requirements for freshwater and marine science, commit to a need for long-term science programs and provide adequate support to achieve these objectives. The issuance of this statement and supporting actions will go a long way towards removing uncertainty, a major impediment to improving morale and productivity, among DFO science staff. Unfortunately, a great deal of scepticism already exists within the Department (including ISAC itself) regarding the commitment and capacity of NSDC to act on the recommendations.

Recommendations

1. A statement of long-term intentions and commitment to DFO Science should be made by the DM.
2. Evidence of concrete considerations and follow-up to the recommendations in this report, to demonstrate a commitment towards improving the DFO workplace.
3. DFO's strengths in freshwater and marine research should be clearly identified and adequately funded. DFO science should not be the last choice when funding research in the aquatic environment.

3. Priorities and funding

3.1 Core programs

Although science funding recently has increased slightly, all of these new funds have gone into new programs while funding to the Department's core programs has steadily eroded over the past decade or more. This has occurred as a result of a variety of initiatives, including Program Review and various A-base "taxes" (e.g., to set up 'high-priority' or 'strategic science' funding). The perception of the committee was that these cuts have generally been made by reducing funding to all programs, without any concomitant evaluation of science priorities or reduction in mandate. Consequently, most of the Department's traditional core programs are seriously under-funded and understaffed and no longer have the capacity to deliver their undiminished mandate. The ability to attract and retain top-quality staff is linked to having well-defined priorities and good funding. Funding to core programs needs to be restored, or difficult decisions need to be made to reduce mandates to levels that can be delivered with the available funds. For example, funding to stock assessment programs has been sharply reduced but in many cases there has been no reduction in both the number of assessments required and in the expectations regarding the complexity of the analysis.

Adequate funding of core programs should be considered a high priority. Support for these programs has steadily declined and is spread so thin between programs that it is not possible to conduct quality scientific research. In extreme cases (e.g., freshwater habitat research), core mandates receive essentially no A-base funding (after facilities costs are accounted for), and research is redirected into whatever areas that can be supported by B-base and external funds (generally research areas with lower priorities than core mandates). In other cases, entire fields which appear to fall within the mandate of the Department (e.g., chemical oceanography) are no longer supported, without any rationale that this expertise is no longer considered necessary to fulfill the Department's mandate. Scientists want to know what areas of expertise DFO requires and intends to support even if it means they must focus their research in different areas.

Recommendations

4. Determine what areas of scientific expertise DFO wants and intends to support in an adequate and stable manner.
5. As a first priority, funding to core programs should be restored. If funding is not restored, mandates must be reduced to levels that can be delivered with the available funds.
6. Identify fields in which the Department has lost its capacity to provide meaningful scientific information and evaluate the long-term impact of this lost expertise to the delivery of the DFO's mandate.
7. DFO scientists should be placed on an equal footing with university scientists when competing for funds by being permitted wherever possible to submit proposals as the

lead scientists in joint proposals or by being permitted to submit independently to appropriate governmental and external funding agencies.

8. Provide funding to every professional to ensure coverage of the minimal yearly operating costs of their laboratory or equipment and for their scientific information needs.

3.2 Strategic funding, special projects and administrative workload

Strategic funding is currently provided for "high-priority" projects. There is the general opinion that these high-priority projects are funded at the expense of core programs. These are large-scale projects, at least zonal in scope and require interregional collaboration. The committee was unable to agree on the value of these strategic funds and how they should be allocated. Suggestions of allocations spanned the range of options, from retention as is, to allocation on a regional basis for regional projects, to complete elimination of the program and re-allocation of funds to regional A-Bases.

In addition to the heavy load imposed by Strategic Funding, being forced to continually apply for B-based sources of funding or writing partnership-orientated research proposals for submission to external funding agencies increases the workload of scientists. These funds are generally required to support the effective operation of the laboratory of individual scientists. Provision of collaborative agreements, administration of funds and added personnel, the preparation of interim and final client reports, and the diversification of research topics undertaken all lead to increased workloads and reduced productivity in in-house research projects. In addition to the increased administrative workload associated with strategic and B-Base funds, increased administration is causing Section Heads to become managers as opposed to scientific leaders. This problem is further aggravated by the many obligatory courses for middle managers, which seem to consume a great deal of time. Finally, many scientists are asked to provide material for committees or sit on committees, yet there never seems to be any follow-up when the job is done (see recommendation 2).

In summary, many of the foregoing concerns are considered to result from ad hoc approaches to problems, together with the consequence of crises generated predominantly through failure to exercise vision and forethought. Much of the workload generated by the Strategic Funding and other administrative burdens placed on management and scientific staff could be reduced by a determined effort to simplify procedures, to provide sound multi-year planning and commitments and by increased trust in regional managers. If the Departmental long term science objectives were clearly defined on a national and regional basis, it would be possible to develop multi-year plans right down to the individual project level and with adequate funds develop parallel funding commitments that would eliminate much of the annual budgetary turmoil.

Longer-term, sound planning arranged collaboratively between appropriate national and regional experts and authorities would not only redress or reduce many of the evils cited

above, which are the fundamental bases for much of the staff dissatisfaction, but would also ensure a smoother running and more productive research organization.

Recommendations

9. There should be a regular annual submission and funding schedule for Strategic Science Funds. This would allow sufficient time to plan well-reasoned project proposals and would permit the timely release of funds early in the fiscal year.
10. Funding for multi-year projects needs to be secure. Cuts in the second or third year of a multi-year project compromise project integrity. Secure multi-year funding is essential for supporting graduate students and postdocs and maintaining support expertise.
11. Scientists need to be involved in setting the priorities for strategic funding. Funding needs to be driven by the need to address clear problems. Priorities should be set by the NSDC or a committee made up of scientists from the Regions.
12. Proposals should be selected for funding by peer review. Proposals should be selected using a clear and transparent evaluation process involving peer review by the NSDC, external and regional scientists. If there is a regional component to high priority funding, regional projects should be reviewed by scientists from other Regions.

4. Scientific personnel

4.1 Develop a stream of new staff

To improve the age structure of DFO Science and ensure a transition of knowledge as retirements occur resources must be increased. The severely truncated age structure is a result of long-term reductions in funding coupled with almost no recruitment. Some recruitment is now occurring, but mainly in new areas while traditional (core) areas continue to suffer from a lack of young staff. This situation will worsen in the near future as staff in these core areas reach retirement age and leave the system. This can be ameliorated through the development of strategies that combine overlap of existing staff and new recruits to provide mentoring. Recruitment of new staff as soon as possible will also generate new ideas and be intellectually stimulating to existing staff as well as send a clear message that DFO is serious about rejuvenation in all programs.

Several points need to be emphasized when new hiring occurs. First, all new hiring should be planned and program based. Second, a career development plan should be designed and be available to all new staff. Training needs of scientific personnel, whether technicians, biologists or scientists, are very specific to the needs of research programs and individual career objectives. Therefore, a variety of opportunities should exist such as more use of sabbaticals, industry exchanges, assignments in other DFO/government laboratories, and technical career development programs like those for RCMP constables and Fishery Officers for developing working-level positions.. Third, although this report generally centres on researchers, there are specialized technical staff, such as machinists, engineers, and welders that provide invaluable support by maintaining scientific equipment and therefore, are necessary to maintain a strong and productive research

organization. Fourth, an increase in hiring will require strong support from Human Resources. Fifth, since many staff are nearing retirement age, immediate action will be necessary to ensure a smooth transition and program continuity.

Mentoring is required for new staff. This issue is very relevant today because new employees are often hired as specialists and these individuals need to be in touch with more than specialized tasks. People at junior levels should be encouraged to discover more about the department. DFO has several mentoring programs with their own structure and organization. For example, CHS has a mentoring program designed to develop young staff. This system does not provide new resources for hiring but it does allow for transfer of knowledge. Recently, DFO announced a new mentoring program. To date it appears that most applicants are mid-career and thus the program does not address the need within Science to train new staff and transfer corporate and scientific knowledge.

The overlap of old and new staff can occur before and/or after older staff retire. The program suggested below in which overlap occurs before retirement is a new approach whereas the programs below in which overlap occurs after older staff retire relies on existing programs. These programs are not mutually exclusive. Under the first program (early retirement/mentoring) we suggest that an overlap period of about two years would be appropriate to transfer knowledge and skills from old to young scientists. Older scientists who are planning to retire could be encouraged to retire early through incentives and at the same time be encouraged, by additional incentives, to remain for about two years to act as mentors and continue winding down their scientific careers as they would if they had not received a retirement incentive. This would retain and transfer knowledge to new staff and would free up salary dollars to hire new staff. Under this program, new staff would enter the system earlier than under a normal retirement progression. Some members of the committee were of the opinion that scientists accepting early retirement would not make good mentors because they were more interested in the retirement incentives. If this proves to be a concern, some thought would have to go into selecting those who would be offered such a package and management would have to promote an atmosphere that convinces senior scientists of their value and the value of the knowledge that they would transfer.

Two other programs, already in existence, are designed for overlap after the older scientist retires. Both were developed in 1987, as options of the Interdepartmental Committee on Revitalization of the Scientific Community. These programs were to facilitate the collaboration between new and experienced research scientists and ensure the effective transfer and preservation of the vast store of special scientific knowledge, skills and expertise upon which DFO has relied for the effective and efficient operation of its research programs. Both programs, briefly described below, have been eroded by budget reductions although both appear to have merit in providing overlap between old and new staff.

The first is the Research Scientist Emeritus designation. This now appears to have been superseded by the Science Employee Emeritus Program (SEEP) which has been broadened to include more job categories than Research Scientists. SEEP "provides an

opportunity to all retiring employees of the Science Sector to continue their work in a non-employment capacity. It is not part-time employment." Mentoring is cited as a key element in the current program. While no firm statistics were available on the status of emeritus scientists, the committee concluded that the population of Emeritus Scientists was quite small and tended to be concentrated in only two regions, and as there was a tendency for many to disappear fairly quickly, few were available to contribute meaningfully to mentoring. In principle, emeritus professionals sign contracts which define the body of work or problems that are to be worked on. This practice should continue. Since the program is essentially voluntary, it is difficult to force emeritus scientists to mentor. However, mentoring could be fostered by providing project funds and adequate support to these individuals.

The second program was the Part-Time Work Program or Term Employment for Retired Public Servants. The purpose was stated as "Part-time work or term employment is available to retired public servants in a variety of work situations including scientific research. Under the current DFO initiative to retain the services of highly productive scientists following retirement, both managers and employees should be alert to opportunities to match-up part-time research requirements with such scientists". It may be possible to include mentoring in this initiative although the same concern about the conflict between desire for money and mentoring may still apply.

The three programs will require new money and the committee emphasizes that bridge funding offered by Treasury Board should be sought rather than internal DFO funding. The use of DFO funds would further reduce the ability of Science to meet its mandate.

Recommendations

13. Staffing of new positions should be focused to address the serious labour deficiencies in scientific research teams. New staff are especially needed in core programs and therefore any new initiatives to increase staff should be started in this area first as soon as possible. This planning should include all job categories including specialized technical experts.
14. Supervisors and human resource personnel should encourage and support career development with specialized training, development of expertise and concomitant career advancement. A percentage of all single operating budgets should be identified each year to cover the cost of justified career advancements.
15. A package that combines an early retirement incentive and a mentoring incentive should be developed for people who are planning to retire and who would be good mentors. Incentives could take different forms but should be attractive enough to entice senior scientists.
16. Management should re-instate the Part-Time Work Program developed in 1987. This should be tied to mentoring.
17. In all three programs noted above (Early Retirement/Mentoring, SEEP and Part-Time Work Program) management should provide an environment to convince retiring or

retired staff that their knowledge is valuable and thereby encourage a positive attitude towards mentoring.

18. Any new monies required to fund early retirement/mentoring, to enhance SEEP and make it more attractive to retirees and to re-instate the Part-Time Work Program should be obtained from outside DFO, such as bridge funding from Treasury Board.
19. Establish or renew funding and provide an administrative mechanism (similar to casual staffing) to support graduate students and postdocs.

4.2 Link scientists and fisheries management

This issue is a concern mainly in stock assessment. The issue is more important in fisheries that are managed by effort controls rather than those managed by quota control. Science needs a better understanding of how decisions are made in fisheries management. The relative importance of scientific, social, and economic analyses in deriving management decisions is often not clearly stated in management plans. This creates difficulty for science staff when dealing with industry because the role of science is not clear.

Recommendations

20. If managers clearly indicated the reason for the management action, for such things as seasonal, weekend or area closures the problem would largely be alleviated. This could be done by producing Stock management Reports similar to Stock Status Reports and/or including rationale for management decisions in the management plans.
21. Exchanges between fishery management and science should be promoted.

4.3 Recognition and credibility of professionals

Merit awards tend to be quite broad-ranging and do not necessarily reward scientific excellence. A national scientific achievement award or even regional scientific achievement awards would be more valuable for providing recognition to our scientific staff. The process would need to be well-defined. It is also important that the committee that reviews these rewards is not involved with nominations. An example of merit awards that have credibility within the DFO research community are the publication awards that several regions have had at various times. For example, C&A has had a best publication award that has been maintained for over 20 years. Publications are short-listed each year by an internal committee, the finalists are sent to outside reviewers, the best paper is chosen, and an invited seminar is presented by the author(s).

Scientific excellence must continue to be the driving force of the incumbent-based research scientist category. There was concern that some scientific staff do not contribute to the organization and yet continue to be highly paid. It was understood that, in

principle, scientists who do not remain productive should be demoted, although demotion rarely, if ever, had taken place.

Recommendations

22. Establish a national scientific achievement award determined by a scientific review based on strict guidelines.
23. Research scientist promotion system should be seen to operate in both directions.

4.4 The inverted pyramid

The committee recognized the need for competent staffing at higher managerial levels of the Department but perceived that a disproportionate share of new funding and hiring was being directed to upper level bureaucrats and policy makers rather than working-level scientists and support staff. Many staff believe that this has resulted in a top-heavy organization with more and more demands for information from fewer scientists at the working level. This is putting an increasing strain on working level scientists, who already bear excessive workloads. Finally, the number of levels and committees needs to be reduced as much as possible so that information can be obtained directly from the scientists without the multiple layers.

Recommendations

24. Re-establish a more natural and sustainable pyramidal structure to DFO Science by placing highest priority on staffing at working professional levels of the organization.
25. Reduce the number of levels and committees between Ottawa and the scientific community as much as possible so that information can be obtained more directly from the scientists.
26. Publish a staffing plan that clearly shows the distribution of management and science positions within all regions of DFO.
27. Reduce administrative overhead and various taxes that severely limit funds available for actual scientific investigations.

4.5 Scientific exchanges

We were surprised at the general lack of knowledge of each other's laboratories. Although natural scientific linkages tend to occur with colleagues working in the same field, many scientists were familiar with only their own labs and possibly labs in the US or Europe, but knew almost nothing of other DFO labs in Canada. Many scientists have stronger linkages with European scientists because of the structure that ICES provides for an interchange of ideas. Approximately 40 Canadian scientists (mostly DFO) attended the most recent ICES Annual Science meeting in Belgium and many Canadian scientists are assuming committee chairs in ICES. Clearly there is an interest among Canadian scientists to meet with other scientists and assume leading roles in scientific organizations. No such opportunities appear to exist in Canada. A well-defined structure

that allows for intellectual exchange among DFO labs is needed. In the past, organizations like CAFSAC provided a structure for us to learn about each other's labs. Exchanges could also be linked to a mentoring program, where mentors of new staff would be from another region. Exchanges are also needed for staff at headquarters. There is a strong feeling that many staff in Ottawa do not have good understanding of what is going on in the regions. While there appears to be less interest in exchanges from the regions to Ottawa, exchanges from Ottawa to the regions should be promoted. There needs to be a clarification and communication of the scientific credentials and roles of advisory staff and research managers in both advisory and operational activities.

Recommendations

28. Opportunity should exist for DFO scientists and professional staff to get together. A scientific forum with well-defined objectives should be organized annually to allow DFO science professionals to learn more about each other's programs.
29. Web sites for all DFO laboratories should be updated to provide details of the research being undertaken and the staff involved.
30. Travel funds should be provided to allow exchanges of professional staff among the research labs.
31. Sabbatical opportunities are available for professional development but they are not being fostered. Scientists should be encouraged to participate in these programs and funds made available if required. Some provision is needed for back filling.

5. Structure

5.1 Equipment and facilities

Equipment and facilities such as buildings, aquaria and vessels are currently repaired or replaced on an *ad hoc* basis. In addition, much of the Department's laboratory equipment is obsolete or is in disrepair because no replacement parts are available. Invariably there are insufficient funds to replace or refurbish this equipment. A long-term plan for replacement of instrumentation and equipment should be formulated based on the rate of obsolescence for each piece of equipment purchased. For example, the useful life of laboratory instruments is about 5 years. Thus, the Department should have a plan in place which replaces about 20% of its instrumentation and equipment each year. Similar (longer cycle) plans should exist for facilities such as buildings, aquaria and vessels.

Recently, poor vessel maintenance has interfered with the successful completion of research surveys. For example, the Wilfred Templeman has had sweep-line, winch-related problems for over two years, and has been unable to cruise at top speed for one year. Because of such mechanical difficulties, fall 1999 and spring 2000 surveys were not completed. Department vessels must be maintained in an appropriate condition for completing surveys. Failure to maintain vessels compromises research programs and makes it difficult to attract excellent people to our programs.

Scientific research cannot happen in a vacuum. Research scientists must have access to current information in order to keep up with their fields of study and require access to a well-stocked library and to professional library staff. Library budgets have not kept pace with increases in the costs of journals and books and as a result, there have been significant reductions in subscriptions and acquisitions. Libraries need increases in funding in order to maintain resources at current levels. New science initiatives can result in increased demand for libraries and consideration should be given to using a portion of new budgets to cover the need for increased library resources.

In addition, technical support of machinists, engineers and welders is needed to develop new instruments for scientific measurements. The custom fabrication of new instruments is an expensive and vital aspect of our science programs. Strategic funding is required to ensure that this capability is maintained.

Recommendations

32. Establish a long-term plan and funding to replace physical assets.
33. In cooperation with the Canadian Coast Guard, the Science sector should establish the necessary funding, priorities, and structures to ensure that vessels are maintained in a condition for science applications.
34. The DFO library system should be the focus of a special study to examine its mandate in relation to the requirements of its clients. All support aspects of the libraries should be included in this study including, but not restricted to, library characteristics, funding, space and personnel. As an interim measure, consideration should be given to use a portion of the budgets of new research programs for enhancing library resources to serve those new programs.

5.2 Changes to structure of the Department

All regions feel that there is an urgent need to re-evaluate the utility of an Oceans sector. The Oceans-Science split has been bad for morale and has created barriers between scientists where there were once natural linkages. In many ways, the split has taken fish out of the ecosystem and illustrates a lack of vision in the Department. Further, reasons for the split were not well explained and there have been many inconsistencies in regional organizational structures. It is clear that most research activities in the Oceans sector are in fact in fresh water and most ocean work is in fact done in Science. There is a need to reinstate a collaborative work environment. Finally, there is a sense that scientific personnel are not a priority in Oceans.

Recommendation

35. Review the need for an Oceans Sector, particularly the need to split Environmental Sciences from the other sciences.

6. Members of ISAC

Drew	Bodaly	Scientist	Oceans	Central and Arctic (FWI)
Jim	Carscadden	Scientist	Science	Newfoundland (NWAFC)
Martin	Castonguay	Scientist	Science	Laurentian (IML)
Michael	Chadwick (champion)	Manager	Science	Gulf (GFC)
Ross	Claytor	Scientist	Science	Maritimes (BIO)
Charles	Gobeil	Scientist	Oceans	Laurentian (IML)
Joanne	Hamel	Biologist	Science	NCR
Debbie	Martin-Robichaud	Biologist	Science	Maritimes (SABS)
Fiona	McLaughlin	Scientist	Science	Pacific (IOS)
Dave	Monahan	Hydrographer	Science	NCR
Joanne	Morgan	Scientist	Science	Newfoundland (NWAFC)
Brian	Power	Hydrographer	Science	Central and Arctic (CCIW)
Jim	Stewart	Scientist	Emeritus	Maritimes (BIO)
Doug	Swain	Scientist	Science	Gulf (GFC)
Ian	Whyte	Scientist	Science	Pacific (PBS)

Response of National Science Director's Committee to Internal Science Advisory Committee (ISAC)

The ISAC report has provided us with 35 recommendations to help alleviate low morale, to help improve the quality of science and to help reduce the loss of highly-skilled personnel. We greatly appreciate the time and effort taken by ISAC to provide us with their thoughts on how to improve the workplace within DFO. We feel that these are excellent recommendations that express the concerns and frustrations of a committed staff after more than a decade of cuts and restructuring. We will endeavour to do everything that is possible to implement these recommendations or at least to use them as a reference point for future action. We have attempted to be specific in our responses, however, ISAC should be aware that there are a number of recommendations that will require several years to put into action and there are others again that are beyond the ability of DFO Science to implement.

Recommendation 1

A statement of long-term intentions and commitment to DFO Science should be made by the DM.

The Deputy Minister is a very strong supporter of our Science programs. Let us quote from one of his recent speeches, the National SARA workshop, September 2000: "DFO is a science-based department."... "I believe that professional and strategic science advice in support of our regulatory obligation (Fisheries Act and Oceans Act) is something that must be done inside government by government scientists.".... "There is a gap between what our regulations oblige us to deliver and our current capacity."... "We need to close this gap."... "We need to deal with recruitment and retention of top quality DFO scientists."... "We need to find ways to increase O&M funding for our scientists in the field.".... "We need to address the issue of equipment and facilities- too many of our scientists are working with out-dated equipment that will eventually put in doubt the validity of our work."

Recommendation 2

Evidence of concrete considerations and follow-up to the recommendations in the ISAC report, to demonstrate a commitment to improving the DFO workplace.

The report has been widely circulated to all science staff and to senior managers of other sectors, including the Deputy Minister. Science directors have provided feedback to all of the recommendations. A number of recommendations have been accepted and action has been taken. Recommendations 9-12 and 28-32 are examples where significant progress has been made. On-going work has been initiated in response to recommendations 7, 13, 14 and 19. Recommendations 20, 21 and 34 will be dealt with at the regional level. There are also a number of complex recommendations that are being examined but a definitive

action plan is not yet in place: they include recommendations 3-6, 8, 22-23, and 27. Recommendations 15-18 are important but require the cooperation of other departments; steps have already been taken. We are unable to respond to recommendations 33 and 35. We do not intend to act directly on recommendations 24-25, believing that they result from inadequate communications, which will be improved in the future.

Recommendation 3

DFO's strengths in freshwater and marine research should be clearly identified and adequately funded. DFO science should not be the last choice when funding research in the aquatic environment.

Last year we completed a Gaps Analysis (Annex 1), a Stock Assessment Review (Annex 2) and a Science Priority-setting Framework (Annex 3). All of these documents give clear insights as to how the department will evolve. We will take immediate steps to ensure that all science staff are aware of the contents of these initiatives. In addition with the help of outside scientists, we will undertake a Sectoral Assessment, which is an on-going requirement for any new increase in Treasury Board funding. You can appreciate that this assessment will require a thorough review of our science priorities. Finally, the ADM Policy has been asked to complete a position paper on DFO's role in fresh water. All of these reviews will help to define the future shape of DFO. We will endeavour to encourage all staff to participate in these initiatives and to keep them informed. Despite the recent influx of new funding (Annex 4), identification of the core freshwater and marine research programs remains one of the key challenges facing our organization.

You should also be aware that we are pursuing a number of new funding initiatives which include:

- resources for northern science and technology, climate change, and work with the wildlife management boards, including vessel funding (Northern S&T Initiative);
- resources for sea lamprey control, great lakes ecosystem work, introduction of exotic species;
- additional biotechnology funding;
- science capacity funding as a horizontal initiative across science-based departments;
- better linkages to NSERC and other granting councils to lever additional funding for departmental science programs;
- major funding for a seabed mapping program

We recognize that funding for the above new initiatives is by no means assured and success will depend on the fiscal situation within government, the competitive process with other funding submissions from departments, and our ability to develop and defend successful cases. There is however, a great deal going on to address our needs and the department is supporting such efforts very strongly. A challenge for Science remains the need to effectively make the case for our work, illustrate why it is critical to have internal capacity to deliver these programs, and illustrate their relevance to Canadians in a meaningful way.

Recommendation 4

Determine what areas of scientific expertise DFO wants and intends to support in an adequate and stable manner.

See response to recommendation 3. Once the appropriate analyses are completed, we will be better positioned to determine the necessary expertise. It should also be remembered that an important part of the assessment review made reference to the development of competency profiles. This is an important part of any determination of future staff requirements that has been recognized throughout the department.

Recommendation 5

As a first priority, funding to core programs should be restored. If funding is not restored, mandates must be reduced to levels that can be delivered with available funds.

NSDC agrees that there is a major problem with respect to our A-base resources and our core programs. The overall review described in recommendation 3 above will position us to deal with this issue.

Recommendation 6

Identify fields in which the department has lost its capacity to provide meaningful scientific information and evaluate the long-term impact of this lost expertise to the delivery of DFO's mandate.

See response to recommendation 5.

Recommendation 7

DFO scientists should be placed on an equal footing with university scientists when competing for funds by being permitted wherever possible to submit proposals as the lead scientists in joint proposals or by being permitted to submit independently to appropriate governmental and external funding agencies.

We agree with this recommendation and support it strongly. It is recognized that many of these funding processes are in other departments and agencies and our ability to influence the process or change it may be limited. This issue has been brought to the attention of deputy ministers and will continue to be a strong element of our interventions in horizontal planning of government science programs or funding arrangements.

Recommendation 8

Provide funding to every professional to ensure coverage of the minimal yearly operating costs of their laboratory or equipment.

See response to recommendation 5.

Recommendation 9

There should be a regular annual submission and funding schedule for Strategic Science Funds. This would allow sufficient time to plan well-reasoned project proposals and would permit the timely release of funds early in the fiscal year.

We agree. The process for the Strategic Science fund has recently been revised and promulgated with requests for submission of proposals. It is agreed that release of funds early in the fiscal year is important and will be ensured. In addition, steps are being taken to ensure the call letters for submissions occur much earlier; in August or September.

Recommendation 10

Funding for multi-year projects needs to be secure. Cuts in the second or third year of a multi-year project compromise project integrity. Secure multi-year funding is essential for supporting graduate students and postdocs and maintaining support expertise.

The approach to funding multi-year projects under the strategic funding envelope is to recognize the need for multi-year projects and maintain a balance between using a portion of the fund for multi-year projects and single year projects. This can be done by planning on carrying forward the identified funding requirement for multi-year projects and attempting to assure overall integrity over several years. NSDC accepts the principle of adhering to a multi-year plan for a given project but must reserve the right to make adjustments if circumstances warrant. For example, if a partner in a project contributing a major percentage of the funding were to pull out, carrying the full project with science resources alone might be difficult and adjustments may have to be made to the program. The need for continuing funding for graduate students and postdoctoral students and for partnerships with academic institutions needs to be recognized as a priority and decisions to make adjustments must be made with this priority in mind.

Recommendation 11

Scientists need to be involved in setting the priorities for strategic funding. Funding needs to be driven by the need to address clear problems. Priorities should be set by the NSDC or a committee of scientists from the Regions.

As can be seen in Annex 4, a group of scientists has been involved with the scientific priority-setting framework and a committee of this nature, perhaps one scientist per region, could be maintained to ensure that scientists are directly involved in this process.

Recommendation 12

Proposals should be selected for funding by peer review. Proposals should be selected using a clear and transparent evaluation process involving peer review by the NSDC, external and regional scientists. If there is a regional component to high priority funding, regional projects should be reviewed by scientists from other regions.

Scientists are involved in the transparent selection of projects for the strategic science fund and feedback is being provided to unsuccessful applicants

Recommendation 13

Staffing of new positions should be focussed to address serious labor deficiencies in Scientific Research teams. New staff are especially needed in core programs and therefore any new initiatives to increase staff should be started in this area first as soon as possible. This planning should include all job categories including specialized technical experts.

We agree wholeheartedly with the need to address critical staffing requirements and labor deficiencies. Serious deficiencies exist at many levels in the organization including specialized technical expertise. New resources provided under Program Integrity I have allowed us to start to address some of the problems in both Science and Environmental Science (show distribution of integrity FTEs in Annex 5) in emerging areas of concern, but it is recognized that this is not sufficient and that deficiencies still exist and are increasing in many core programs. The review discussed in recommendation 3 should better position us to deal with this important issue.

Recommendation 14

Supervisors and human resource personnel should encourage and support career development with specialized training, development of expertise and concomitant career advancement. A percentage of all single operating budgets should be identified each year to cover the cost of justified career advancements.

We agree with the importance of career development and training and will place increased emphasis on this initiative in work planning. Career development and learning is one of the seven departmental priorities under the National Workplace Improvement Program. Additional resources are being devoted to this area nationally to facilitate

progress. NSDC will consider allocating additional resources to this area as part of the business planning process.

Recommendations 15, 16, 17 and 18

- 15. A package that combines an early retirement incentive and a mentoring incentive should be developed for people who are planning to retire and would be good mentors. Incentives could take different forms but should be attractive enough to entice senior scientists.**
- 16. Management should re-instate the Part-time Work Program developed in 1987. This should be tied to mentoring.**
- 17. In all three programs noted above (Early Retirement/Mentoring, SEEP- Science Employee Emeritus Program, and Part-time Work Program) management should provide an environment to convince retiring or retired staff that their knowledge is valuable and thereby encourage a positive attitude towards mentoring.**
- 18. Any new monies required to fund early retirement/mentoring, to enhance SEEP and make it more attractive to retirees and to re-instate the Part Time Work Program should be obtained from outside DFO, such as bridge funding from Treasury Board.**

We support the concept of an early retirement and mentoring incentive program. The exact design of such a program needs to be investigated and complexities related to pension, rules and procedures and authorities held by the department require evaluation. Existing flexibility to do things is not well understood and needs to be elaborated. Part-time work and use of emeritus arrangements will be considered in our approach. Such initiatives should address key technical positions as well as scientific positions. Discussions on this subject have been initiated with Treasury Board officials and management will pursue this idea both as a departmental initiative and also as a horizontal initiative across the science-based departments. Treasury Board officials have responded to this initiative and presented options on how to address part time mentoring programs in relation to the pension system at a recent meeting of ADMs of Science-Based departments. We are exploring what can be done under existing authorities as well as new proposals that the Treasury Board is developing. We have set aside funding from the Integrity II resources to develop a mentoring program for RES's and EG's which will be tied to new recruits under the recently-acquired Integrity II and Graduate Opportunities funding. Details of this program will be announced to staff within two months.

It is agreed that this is desirable to have a fund for early retirement and mentoring; however, external money should not be seen as essential to whether a program is initiated. Ability to obtain new resources requires success in negotiations with Treasury

Board and may require Cabinet approval. Thus success is not guaranteed. These recommendations are under active investigation by senior management and discussions have begun with Treasury Board. The department has the ability to use Emeritus and Part-time Work arrangements as well as mentoring to address the problem. Innovative approaches may minimize impacts on operating budgets.

Recommendation 19

Establish or renew funding and provide an administrative mechanism (similar to casual staffing) to support graduate students and postdocs.

Partnership funding associated with Program Integrity 1 allocations (Annexes 1 and 6) has been used to support graduate students, university Chairs and student training programs. In 2000-2001, the Department supported 75 graduate students at 25 Canadian universities located in all regions at the Masters, Doctoral and Post-Doctoral level by providing grants linked to NSERC grants for students working in priority areas of interest to the Department (See Annex 6). We will endeavour to better publicize this new initiative. Negotiations are proceeding with NSERC to expand this program and to develop a Subvention Program in order to lever additional resources. Funding has also been provided to assist with training aboriginal students.

Recommendations 20, 21

20. If managers clearly indicated the reason for the management action, such things as seasonal, weekend or area closures the problem (how decisions are made in fisheries management) would largely be alleviated. This could be done by producing Stock Management Reports similar to Stock Status Reports and/or including rationale for management decisions in the management plans.

21. Exchanges between fisheries management and science should be promoted.

We will encourage our regional directors of science to participate actively in the post-season reviews of fisheries. In addition, it is worth noting that Science and Fisheries Management are actively working on the precautionary and ecosystem approaches and the implementation of objectives-based fisheries management regimes. Workshops have been held and a number of pilot fisheries projects identified to test the objectives-based fisheries management approach. These initiatives are facilitating better integration between the sectors and address the need to identify performance measures that allow evaluation of success and utilization of information for decision-making. Science will continue to support this integration as a high priority.

Recommendations 22, 23

- 22. Establish a national scientific achievement award determined by a scientific review based on strict guidelines.**
- 23. Research scientist promotion system should be seen to operate in both directions.**

NSDC will design and implement a national scientific award in accordance with the recommendation. It will be based on strict guidelines and successful candidates will be selected by scientists within the department as well as external peers. This award will be implemented in 2001-02 fiscal year.

NSDC endorses the continued hard work, dedication and contributions of our scientists and feels the large majority are contributing in a major way. Recent reviews of our publications and citations illustrate that departmental scientists are operating at a very high standard of scientific excellence. Science managers are hereby instructed to look very carefully at any instances of poor performance or non-performance and take appropriate action in keeping with established human resource management procedures.

Recommendation 24

Re-establish a more natural and sustainable pyramidal structure to DFO Science by placing highest priority on staffing working professional levels of the organization.

We do not agree that a greater proportion of new positions are being staffed at headquarters as opposed to the regions. We will post an organization chart and staffing plan that clearly shows the distribution of management and science positions within all regions of DFO.

Recommendation 25

Reduce the number of levels and committees between Ottawa and the scientific community as much as possible so that information can be obtained more directly from the scientists.

It is agreed that a better linkage between the scientists and Ottawa officials is needed. ISAC was created to address this need and provide a linkage between scientific and professional staff and science management. Regular ADM and DG visits to regions, discussions with staff, meetings with regional management committees, briefings on key programs of the science program and one on one discussions with scientists have been implemented to open this dialogue. NSDC has adopted a policy of moving its meetings from major center to major center, including targeted science presentations by staff at NSDC meetings, and walkabouts and "meet and greet" sessions as part of the regular

NSDC agenda. Meetings with scientist Emeritus personnel have also been implemented by the ADM Science. These efforts will continue.

Recommendation 26

Publish a staffing plan that clearly shows the distribution of management and science positions within all regions of DFO.

We agree and will prepare and distribute an organizational structure within 3 months. We also intend to re-vitalize the internet site within the immediate future.

Recommendation 27

Reduce administrative overhead and various taxes that severely limit funds available for actual scientific investigations.

We will examine this situation in each region. The findings will be discussed with RDG's and the impact on science programs will be assessed. Realistically, elimination of all such arrangements is unlikely until the overall funding situation in the department improves.

Recommendations 28, 29, 30

- 28. Opportunity should exist for DFO scientists and professional staff to get together. A scientific forum with well-defined objectives should be organized annually to allow DFO science professionals to learn more about each other's programs.**
- 29. Web sites for all DFO laboratories should be updated to provide details of the research being undertaken and the staff involved.**
- 30. Travel funds should be provided to allow exchanges of professional staff among the research labs.**

Intellectual exchange amongst DFO laboratories is recognized as important and efforts must be made to strengthen this exchange in keeping with the recommendations. Electronic means will be helpful but are no substitute for face to face gatherings and opportunities to discuss program activities.

We agree and will ensure that a modern and current website is maintained.

We will set aside funding for an annual scientific forum in 2001-02 as recommended. The first forum will take place November 14-16, 2001 at IOS. In addition, funding will be provided for several workshops on priority scientific issues where participation and interchange between regional scientific staff will be facilitated. Regional Science

Directors will be encouraged to send staff to these sessions and to provide top-up travel funding where required.

Recommendation 31

Sabbatical opportunities are available for professional development but they are not being fostered. Scientists should be encouraged to participate in these programs and funds made available if required. Some provision is needed for back filling.

We encourage science managers to include sabbaticals, interchanges and other similar opportunities as an inherent component of our Career Development and Learning initiatives. In keeping with the action plan described under recommendation 14, these initiatives should be built into the plan and budgeted for. Planning should include provision for back-up. Cases where there is little or no back-up in critical areas should be identified as part of the science gaps analysis that is being carried out as the program is vulnerable when we become dependent on individuals or small groups of individuals. Planning for such initiatives must be practical to reflect critical program delivery, timing and other considerations. Workload should not be a rationale for failing to plan for this sort of opportunity on a case by case basis.

Recommendation 32

Establish a long-term plan and funding to replace physical assets.

The department has recently received new funding for facilities and equipment upgrades (Annex 7). An additional \$ 3.0 Million in capital equipment money for Science and Environmental Science was received in 2000-01 and the DM provided \$ 1.5 Million for upgrading oceanographic winches across the department. Facilities upgrades at St. Andrews and BIO are in the planning stage and additional improvements are planned at IML. At the West Vancouver Laboratory, a very difficult partnering initiative has been moving very slowly, creating frustration for all involved. Recently, the Minister has asked for a business case and action plan to advance this initiative, possibly by making West Vancouver Laboratory a West Coast Center of Excellence for Aquaculture R&D. Plans are also being advanced to try to secure funding for vessel operations, including science vessel funding for Arctic activities. In the Great Lakes, the situation regarding the operation of the Limnos will be investigated with the objective of regularizing arrangements and addressing access problems for freshwater programs.

Recommendation 33

In cooperation with the Canadian Coast Guard, the Science sector should establish the necessary funding, priorities, and structures to ensure that vessels are maintained in a condition for science applications.

Science will work closely with Coast Guard and the departmental management committee to attempt to ensure adequate funding and infrastructure is present to support the science program. Currently, the ADM Science represents our sector on the Committee dealing with restructuring of the fleet and development of the department's response to the Auditor General's review of the science program.

Recommendation 34

The DFO library system should be the focus of a special study to examine its mandate in relation to the requirements of its clients. All support aspects of the libraries should be included in this study including, but not restricted to, library characteristics, funding, space and personnel. As an interim measure, consideration should be given to use a portion of the budgets of new research programs for enhancing library resources to serve those new programs.

We agree that our libraries are an important investment that needs to be bolstered. NSDC intends to address this issue over the next year. Regional Directors will be encouraged to initiate action on this item through their regional library management committees.

Recommendation 35

Review the need for an Oceans Sector, particularly the need to split Environmental Sciences from the other sciences.

At this time there is no immediate intent to revisit this decision. Oceans sector and Science sector are working closely together and Oceans representatives take part in all management meetings associated with the Science program and jointly address issues such as new funding, strategic fund allocation processes, and linkages to other science-based departments.

ANNEX I

Summary of GAPS analysis

- Analysis confirms that all of the DFO's core responsibilities need in-house science support in order to fulfill their mandate
- The DFO in-house science program is fully directed towards supporting DFO existing core responsibilities
- The level of supporting science activities has fallen significantly behind in recent years
- DFO existing core responsibilities are expanding and science support is required for decision making
- New approaches and initiatives taken by DFO (ex: Precautionary and Ecosystem approaches, OBFM, Integrated Management) impose high demand on science
- Additional resources have been provided to science for new or emerging core responsibilities, but only partial funding was provided
- Initiatives are currently underway to improve science efficiency, realign and leverage resources
- Stock Assessment Review completed
- ASD for CHS near completion
- New opportunities for partnership are being pursued
- Potential to realign science resources will remain limited unless DFO drops core responsibilities
- Critical science gaps exist for each DFO existing and emerging core responsibility
- There is also important cross-cutting issues that need to be addressed: Freshwater, Arctic and Climate change
- Major investment in science (doubling the science budget) will be required if DFO wants to fulfill all its existing and emerging core responsibilities in a totally risk-averse manner
- In all likelihood DFO will not drop any core responsibilities
- Doubling DFO science budget is not likely to happen either
- DFO core responsibilities will have to be managed with some level of risk

ANNEX II

Summary of Stock Assessment Review

First priority

- conservation advice in a risk management context
- improving explanatory and forecasting capacity
- include ecosystem, integrated approaches
- aboriginal, international obligations
- species at risk

Activities DFO must maintain to support first priority

- data collection, analysis to support first priority activities (e.g. fishery-independent surveys)
- ecosystem monitoring
- hold, maintain assessment data sets
- standards, quality control
- operate peer review/advisory processes
- communicate results

Overall the program is unable to deliver all required advice for management decision-making

There are areas where basic stock assessment capacity is not in place

- Arctic and northern (Nunavut Management Board)
- Freshwater (where DFO has management mandate)
- Aboriginal and subsistence (Response to Marshall)
- Atlantic salmon
- Certain stocks mainly funded by partners (ex: Pacific invertebrates, Gulf snow crab)
- Northern shrimp, Nfld crab, Pacific groundfish,

To support new demands and approaches, DFO Science must expand activities in certain areas:

- conservation limits and targets:
definition, development and communication
- status of species at risk
- forecasting capacity
- provision of advice at multiple spatial scales
- monitoring ecosystems, biodiversity, invasive species, impacts of fishing
- trophic interactions, forage species
- integration of data

Also need to increase activity, in collaboration with other programs or partners, on:

- monitoring at spatial scales adequate to address issues
- predator-prey modelling
- climate/regime impacts on productivity

ANNEX III

Scientific Priority Setting

The Scientific Priority Setting working group proposes that the National Science Directors Committee (NSDC) be the Office of Prime Interest in leading the development of DFO's scientific priorities. DFO management committees such as the Deputy Minister Committee (DMC), regional management boards and zonal committees, as well as regional scientific staff meetings would play an important role in the SPSP. Advice from external and international advisory councils, boards and committees including representation from clients, stakeholders, academia, NGOs, and aboriginal would also be considered in developing DFO scientific priorities.

Regional input is essential in all steps of priority setting. The SPSP working group suggests that a Regional Scientific Advisory Committee (RSAC), reporting to the Regional Director Science (RDS), be implemented in each region. Such a committee should include DFO and external scientists and representatives from other DFO sectors when appropriate. The working group also suggests that a co-ordination mechanism be explored to ensure the exchange of information between the RSACs and the Science Advisory Council, which reports to the ADM Science.

The working group recommends a three-tier approach to set scientific priorities within DFO. A set of criteria to assess priorities is also proposed (Annex 1). It is of utmost importance that the priority setting process represent a balance among:

- ☐ the essential need for stable multi-year funding for most research programs,
- ☐ the importance of periodic reviews of programs, and
- ☐ the requirement for flexibility to initiate new programs in strategic areas.

To provide this balance, the process must involve careful co-ordination between the development and review of strategic directions and programs on multi-year time scales (e.g. 3-10 years), and an annual cycle of review and planning in conjunction with that of the Department.

Tier 1: Environmental Scanning and Setting Strategic Directions - National and Regional Co-Leads

Priority setting must rely on a solid scan of internal and external drivers. These could be captured from multiple sources ranging from the Speech from the Throne, strategic documents, advisory bodies and conferences, to the proceedings of key scientific workshops. Key drivers influencing science must be identified from different sources on an ongoing basis and NSDC, including Directors of Environmental Science (DES), must play a key role in ensuring that this information is fully captured and used in setting strategic directions. Primary activity in this tier should be on the multi-year time scale, with an annual refinement of the strategic directions providing an initial step in the annual cycle of the priority setting process. Annex 2 provides examples of useful documents and information sources that should be used to identify key drivers.

At the national level, the four Science DGs (Fisheries Population Science, Ocean and Aquaculture Science, Hydrography and Program Planning & Co-ordination) and the Director of Environmental Science (DES) should play a key role in providing NSDC with the environmental scan in their respective sphere of responsibilities. Program DGs and DES should co-ordinate the gathering and review of relevant information at the national and international levels, identify key drivers and recommend strategic directions. Regional input should be sought during the process. The DG Program Planning & Co-ordination should co-ordinate the gathering and review of strategic information at the government and DFO level and identify key trends.

At the regional level, the RSDs and Regional Directors Oceans (RDO) who manage Environmental Science (Maritimes and Laurentian regions) must play a key role in providing NSDC with a regional environmental scan. They should co-ordinate the gathering and review of relevant information at the regional level, identify key drivers and make recommendations on strategic directions. National input should be sought during the process.

This level of wide-based participation would ensure inter-regional/sectoral, zonal and national-regional co-ordination in developing strategic directions.

NSDC should be accountable for reviewing national and regional recommendations on strategic directions and agree upon a set of directions for the following year (some of these directions could be long-term). The review would identify areas of both new and reduced priorities.

Time frame:

- ☐ Macro-level inputs (DMC, Speech from the Throne and Budget speech, etc.) to annual refinement provided by late winter / early spring.
- ☐ Inputs from various sources summarised before the end of summer.
- ☐ NSDC meets to set broad scientific strategic directions for the following year by late summer.

Tier 2: Setting Program Priorities - National and Regional Co-Leads

Based on the strategic directions set up by NSDC, program priorities will be developed along with an assessment of components of the programs needing realignment. Much of the program development and realignment should be carried out on the multi-year time scale (e.g. a year of planning and proposal development for a multi-year program), but the need for changes in priorities would be reviewed annually considering program performance and new strategic directions in the context of the importance of completing existing programs. Funding issues linked to various program components will also be addressed at that stage. (Figure 1).

The Science DGs, RSDs, DES and RDOs would work co-operatively in developing program priorities. They would identify relevant teams responsible to develop scientific program priorities based on strategic directions set up by NSDC. The Science DGs and

the DES would play a lead role in implementing the process for national or multi-regional program priorities, while RSDs and RDOs would lead the process at the regional level.

The process should include consultations/discussions with DFO and external scientists (specifics depending on program size, scope, etc.). The consultations, which would be led by RSDs/RDOs or the Science DGs/DES, depending on the national scope of the issue, would help to define optimal approaches for ranking program priorities. Scientific excellence, tractability, required expertise and infrastructure, and relevance to regional and national strategic directions would be taken into consideration.

Once program priorities are established, they would be used to develop national/regional scientific programs/projects and to evaluate project proposals submitted for funding under the Science Strategic Fund. It is also at this level that priorities could be identified under different funding opportunities other than A-Base (e.g. PERD, CCAF, Space Plan).

Time frame:

- ☐ Joint RSD/RDO/DG/DES initiative to review and set priorities for the following year.
September - October
- ☐ Recommendations to NSDC - October

Tier 3: Development of Scientific Programs / Projects - Regional with National Input

This 3rd tier would be the primary responsibility of the RSDs and RDOs, and would focus on the scientific excellence, tractability and relevance of the programs/projects. However, in the case of programs with a national/international scope, the DGs, DES and Directors would provide an important role in co-ordination, planning and review. In each case, a peer review process would be carried out.

Proposals using external funds would also need to be carefully identified in this process so that RSDs and RDOs could make efficient and relevant decision on resources (human and financial) available to support the priorities approved by the ADM.

Time frame:

- ☐ Multi-year or annual development of program/project proposals - December.
- ☐ Peer and management reviews of program / project proposals - January.
- ☐ Funding decisions - February

Criteria to assess scientific priorities

1. Relationship to national priorities (Evaluation in all Tiers, but primarily in I and II.)
 - a) Federal (Speech from the Throne, Budget Speech, Report on Plans and Priorities)
 - b) Departmental (DFO Strategic Plan)
 - c) Sectors (Science Strategic Plan and other Sectors SP)
 - d) Interdepartmental (5NR, Climate programs, PERD, etc)

- e) National issues and capabilities (with Universities and Private Sector)
 - f) External advisory committees (FRCC, PFRCC, SAC, etc.)
 - g) International (NAFO, ICES, PISCES, etc.)
2. Relationship to regional priorities (Evaluation in all Tiers, but primarily in II and III)
- a) Regional DFO
 - b) Regional DFO Science
 - c) Other federal agencies in regions (DOE, NRCan, DND, NSERC)
 - d) Industry
 - e) Environmental Groups
 - f) Aboriginal Groups
 - g) Provincial priorities
 - h) Universities
 - i) Other Stakeholders
3. Scientific excellence (Evaluation in Tiers II and III, primarily in III)
- a) Soundness and merit
 - b) Innovation and effectiveness (potential for application of results)
 - c) Contribution to departmental expertise and capabilities
 - d) Feasibility
 - e) Cost/benefit
 - f) Methodology
 - g) Assessment of the expertise and past project appraisals (Investigator / Team members)
 - h) Development of new skills and competencies
4. Partnership with other external and international scientific activities; increase DFO scientific capacity (Evaluation in all Tiers, primarily in II and III)
- a) Effectiveness of partnering among different DFO regions/sectors, non-DFO institutions, different disciplines and clients/stakeholders.
 - b) Developing new knowledge networks
 - c) Expected cost savings through sharing of resources with the partners.
 - d) Improved client satisfaction
 - e) Integrating disciplines (multidisciplinary team)
 - f) Leveraging external resources (human and financial) at the national and international level

ANNEX IV

New funding obtained for Science over the past year and how it was spent.

- \$ 2 M from the DMC to augment the Science A-base, permanent ongoing funding;
- \$ 13.1 M to science and environmental science from Program Integrity I, ongoing;
- hiring of 129 new FTE's in science and environmental Science in the last two years;
- \$ 7.6 M new dollars in Biotechnology funding;

\$ 75 M in new aquaculture funding and \$ 20M of this for Aquaculture Science Program in collaboration with industry, \$ 3.5 M per year of which will be administered through science and contribute to augmenting our internal capacity;

- \$ 3 M ongoing in new capital equipment funding;
- \$ 1.0 M per year for 5 years to enhance MEDS and CHS data management nationally;
- \$ 1.5 M for winches, one time special equipment purchases;
- \$ 3.7 M for scientific equipment and other Lab items, one time special equipment purchases;
- \$ 500k for Laurentian Region major Oceanographic Computer;
- \$ 900k for oceanographic floats for the ARGO program;
- \$ 5.0 M for sentinel fisheries program (permanent funding to alleviate on-going funding pressure)
- \$42.5 M over 5 years commencing in 2000/01 for Species at Risk work and access to additional funding through the DOE Habitat Stewardship program funding (\$ 11.5m to science)
- \$ 10.5 M for facilities improvement in 2001-02;
- \$ 8.0 M for Pacific Salmon Treaty;
- \$ 2.0 M for at Sea Research (Hudson Funding) for the fiscal year 98/99 to 00/01;
- \$ 527k Fish Health Tax refund to the regions;
- \$ 375k to fund salary shortfalls in Newfoundland and Laurentian Regions;
- \$ 700k to fund program issues in Newfoundland region as a result of reduced vessel operations;
- \$ 400k assistance for West Vancouver Lab, temporary funding in 1999/00 & 2000/01;
- \$ 400k permanent funding for Mactaquac Hatchery;
- \$ 3.4 M for PERD.

New resources commencing in Fiscal Year 2001/02

- Program Integrity II - \$ 2.7M (01/02) and \$ 2.4M (02/03)
- Graduate Opportunity Strategy(GOS) \$ 800K
- Marshall \$ 500K
- Agro Float Program \$ 1.4 M over 4 years
- Network of Tide Gauges in the North \$ 1.4 M over 4 years
- Freshwater Activities \$ 600K over 4 years

ANNEX V

Distribution of new FTEs in Program Integrity 1 and 2

Regional Allocation, including R&R phase 1

SCIENCE							
Regions	R&R Phase 1	R&R Phase 2	Improve Manage	Strategic Invest.	Platform	Total Region	FTEs
Newfoundland	870	704	97			1671	18
	790	602	0			1392	15
Maritimes & Gulf	184	500	0			684	7
Laurentian	846	602	97			1545	17
Atlantic Zone	400	0	0		600	1000	0
Central & Arctic	654	500	97			1251	13
Pacific	1228	672	0		200	2100	19
NCR	684	346	327			1357	10
Platforms						0	
University Partnerships				450		450	
Native partnerships				150		150	
Strategic Funds / Subvention				1300		1300	
Ocean Sector							
Total Science	5656	3926	618	1900	800	12900	99

INTEGRITY 2							GOS		TOTAL
	SAL *	MENTORING	EBP	ACC	O&M	TOTAL	SAL *		PI 2 + GOS
DFO									
Science	627				1189	1816	574		2390
Oceans	244				478	722	229		951
	871				1667	2538	803		3341

ANNEX VI

DFO-NSERC Scholarship Program

University Subvention Program (2000-2001)

Recommended supplements to NSERC Scholarships and Fellowships

Region	Masters	PhD	PDF*	Total Number	Funding for Master's	Funding for PhD	Funding for Post Doc	Total Funding
C&A	18	11	3	32	90.0	55.0	22.5	167.5
Gulf	1			1	5.0	0.0	0.0	5.0
Laurentian	3	8	1	12	15.0	40.0	7.5	62.5
Maritimes	2	4		6	10.0	20.0	0.0	30.0
Nfld	1			1	5.0	0.0	0.0	5.0
Pacific	14	2	2	18	70.0	10.0	15.0	95.0
Out-of-Country**	0	3	2	5	0.0	15.0	15.0	30.0
Totals	39	28	8	75	195.0	140.0	60.0	395.0

ANNEX VII

Funding received under Program Integrity-Rust-out initiatives

Budget for 2001/02

Sector Summary					
	FTEs	Sal	O&M / CAP	G&C	Total
Nfld	164	14,142	7,703	90	22,099
Maritimes	306	22,747	9,258	290	32,601
Gulf	80	4,151	3,040	170	7,441
Laur	171	10,935	5,943	150	17,199
C&A	109	7,564	3,548	120	11,341
Pac	320	21,361	13,322	125	35,128
NCR	135	9,962	13,209	46	23,352
Subvention	-	-	400	-	400
ACRDP	-	-	3,500	-	3,500
Total	1285	90,862	59,923	991	153,061
Vessels	305				

Note that the vessel FTEs are not included in regional #s but the \$ are

Distribution by Business Line

Fisheries and Oceans Science

	FTEs	Sal	O&M / CAP	G&C	Total
Nfld	155	13,590	7,615	90	21,450
Maritimes	244	18,520	8,378	290	27,432
Gulf	80	4,151	3,040	170	7,441
Laur	126	7,835	5,105	150	13,216
C&A	50	3,842	2,781	120	6,793
Pac	258	17,679	12,571	125	30,633
NCR	80	6,825	10,281	-	17,186
Subvention	0	-	400	-	400
ACRDP	0	-	3,500	-	3,500
Total	993	72,442	53,671	945	128,051

Vessels 275

Note that the vessel FTEs are not included in regional #s but the \$ are

Canadian Hydrographic Services

	FTEs	Sal	O&M / CAP	G&C	Total
Nfld	9	552	88	-	649
Maritimes	62	4,227	880	-	5,169
Gulf	0	-	-	-	-
Laur	45	3,100	838	-	3,983
C&A	59	3,722	767	-	4,548
Pac	62	3,682	751	-	4,495
NCR	55	3,137	2,928	46	6,166
Total	292	18,420	6,252	46	25,010

Vessels 30

Note that the vessel FTEs are not included in regional #s but the \$ are