

2006-2007 Report



**restoring
fisheries**

**conserving
aquatic life**

**rebuilding
ecosystems**

**researching
the options**

Fisheries Centre

The University of British Columbia



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Director's Introduction

The years 2006 to 2007 were, for the Fisheries Centre, relatively calm, at least when compared to the past biennium, which saw us wander from 'the huts' into temporary housing, then return triumphantly to Main Mall.

We are still discovering our new building, the Aquatic Ecosystems Research Laboratory or AERL. We discovered that it is more spacious than we feared, but also more noisy and drafty than we had hoped. And, as we gradually sort out its various kinks, the AERL becomes more familiar, becomes part of what we are.

However, we have not become so comfortable that the drive to connect, to research and to publish would have been affected, and this report documents a wide range of activities demonstrating that.

The scholarly books, and the many articles in peer-reviewed publications that have been published by Fisheries Centre faculty and other members have been complemented by a vast number of articles and interviews in mass media attesting to our commitment to communicating with the public, in addition to contributing to the scientific and scholarly literature documented in this report. Those contributions to civil society are recognized by our university, and are the reason why the new UBC President, Professor Stephen J. Toope, so regularly mentions the Fisheries Centre in his various speeches about UBC's clout. This is in stark contrast to our operating budget from UBC, on the last page of this report.

I hope that, in the next years, we will be able to translate the international, national, provincial, and campus-wide recognition that the Fisheries Centre enjoys into wider support for its overworked and underfunded administrative infrastructure. In fact, I hope this will become the main message of the five-years review that we expect in early 2008.

I conclude by taking this opportunity to thank my colleagues, and the staff and students of the Centre, and all our friends on the UBC campus, who have made it not only a pleasure, but also a matter of pride to be able to speak and write on behalf of the Fisheries Centre.



Dr Daniel Pauly
Director
Fisheries Centre



Fisheries Centre Mission and Activities

We recall the Fisheries Centre's mission statement, which was developed in 1993, slightly modified since, and still relevant today:

Our planet's fisheries have reached their ecological limits. As benefits from traditional resources decrease, pressure grows to exploit other resources, a process not necessarily compatible with ecosystem health.

Policy and planning for ecosystem-based management must then be informed by knowledge of the interplay of human, biotic and environmental factors that affect ecosystem structure and function. Key requirements are sufficient time-depth to capture biodiversity, abundance and trophic structure prior to depletion, identification of the full range of benefits that healthy ecosystems provide to present and future generations and integration of the fine-scale knowledge of the maritime community with large-scale national and international fisheries management.

The Fisheries Centre promotes multidisciplinary study of aquatic ecosystems and broad-based collaboration with maritime communities, government, NGOs and other partners. We believe that the social capital developed through collaboration and the intellectual capital that increased knowledge of ecosystem function and values represents can lead to the re-investment in natural capital necessary to conserve and restore aquatic systems.

As previously, this mission inspired, in 2006 and 2007, numerous research and outreach activities, both in-house and linked with outside organizations (see list of publications, p. 27-42). This research and these outreach activities included convening international and domestic conferences and workshops, drawing researchers and policy-makers from around the world and locally. However, our emphasis remained on the instructional supervision of graduate (MSc and PhD) students, see p. 19-23.

To document these activities, in 2006-2007, the Fisheries Centre published 15 *Fisheries Centre Research Reports* and 31 items in our *Working Paper Series*, both often serving as basis for subsequent submission to peer-reviewed literature. Also, we continued to publish *FishBytes*, the Centre's bimonthly newsletter, which has been produced and distributed internationally since 1995.

The Centre continued to host a weekly seminar from September to April, funded by the Province of British Columbia Ministry of Environment, which allows the Centre to bring speakers from Canada and abroad, while providing our students with a forum for peer review of their work in progress (see box). The Centre also hosted dozens of short and long-term Canadian and international visitors, who shared their expertise with the members (see p. 43). The Fisheries Centre also has a prestigious lecture series, the Larkin Lectures, held in memory of the late Professor Peter Larkin and funded through an endowment established by his colleagues, family, and friends. The Larkin Lecture for the 2006 to 2007 period was by Dr Ray Hilborn (2007; *Managing fisheries is managing people: what has been learned?* *Fish and Fisheries* 8(4): 285-296).

We are gratified by the increased recognition of our activities, detailed in the next pages.

The Fisheries Centre Friday seminars: Stimulating minds, stomachs and community

The Fisheries Centre seminars, held every Friday from 11am-12pm, are a weekly opportunity for the members of the Fisheries Centre to share in the latest aspects of fisheries research and to fuel the *esprit de corps* of the Centre (the donuts beforehand only fuel the *corps*). The lecture series, organized by a current graduate student, is also offered as a course (FISH 500) for incoming Fisheries Centre students intended to foster critical thinking about the presentations. Each student is also expected to take the stage and reveal their own plans for fisheries research.

The diversity of speakers is large; from quantitative modelers to NGO staff to the students themselves, the Fisheries Centre has benefited from the insights of a number of brilliant speakers. For instance, the first seminar of the 2006-2007 academic year began with science historian (and former tree-dweller) George Dyson's account of sea otter hunts from baidarka canoes in the Aleutian Islands. The second term, the FC members were fascinated by Manfred Milinski of the Max Planck Institute in Plön, Germany, who discussed reputation in the public goods game and demonstrated the power of peer acceptance. In the fall of 2007, Colin Clark of UBC tackled ITQs, and David Suzuki shared why he left science for the "vulgar media world".



Fisheries Centre seminar coordinators
Jennifer Jacquet (2006-2007) & Sarika Cullis-Suzuki (2007-)

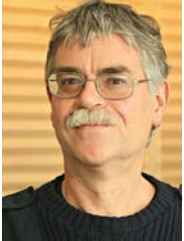


Aboriginal Fisheries



What the Future Beholds

This image depicts two returning salmon encircling a salmon egg. It is a statement that our fisheries ecosystem is fragile and that conservation is necessary in order for the future returns to be seen. We need to see our salmon come back year after year and through education and knowledge this can happen.



Nigel Haggan
Aboriginal Liaison



Mimi E. Lam
Adjunct Professor

The Aboriginal Fisheries Research Unit has, since 2006, a new logo, entitled “What the Future Beholds.” The logo design and caption are by BC Aboriginal artist Dean Heron, a member of the Wolf Clan, Kaska-Tlingit First Nations, who writes “I am inspired by the old stories and often paint what comes to mind when I hear them...The stories have significant narratives that we can all learn from – whether you are Aboriginal or non-Aboriginal.”

Today, in the face of global climate change and environmental degradation, we believe it is especially critical to recognize and embrace the valuable contributions of aboriginal people to fisheries and natural resources management in BC, the Pacific Northwest, and internationally. Our 2006 – 2007 highlights thus revolve around cementing local and global partnerships with aboriginal communities and academic scholars. Locally, community partnerships with the Homalco First Nation, Haida First Nation, and Lummi Indian Nation explore issues of educational and research capacity-building, integrated marine planning, fisheries co-management, and governance. Institutionally, we are partnering with the UBC First Nations House of Learning, Faculty of Science, and Faculty of Education to create supportive integrated educational and research opportunities – intellectually, emotionally, socially, and culturally – to attract and retain aboriginal students.

Aboriginal Liaison Nigel Haggan continues his tireless efforts to recruit aboriginal students, engage with local communities, and exchange ideas, including from his doctoral research with Rashid Sumaila, at conferences, such as of the American Fisheries Society and Ecological Society of America (ESA), as well as the CEDAR Summer Science Camp. Adjunct Professor Dr Mimi E. Lam was elected Secretary of the ESA Traditional Ecological Knowledge Section and appointed to the International Advisory Council of the Indigenous Education Institute in recognition of her cross-cultural research, educational expertise, and community partnerships. Profiled in *Fostering Connections* (Winds of Change Autumn 2007), Dr Lam is strengthening partnerships to create opportunities within the Aboriginal Fisheries Unit for aboriginal Fisheries Centre students, which have included Megan Moody, Nuxalk First Nation (M.Sc. student with Tony Pitcher), and Stephen Watkinson, Tsimshian First Nation (M.Sc. degree 2001 with Daniel Pauly).

Our collaborative work is being supported by funding from the Fisheries Centre, Department of Fisheries and Oceans Canada, Vancouver Foundation, National Science Foundation, and Gordon and Betty Moore Foundation.

Finally, a new professor of Aboriginal Fisheries has been hired, Dr David Close, who, from 2008, will lead aboriginal fisheries initiatives. Also, through his cross-appointment with Zoology, he will strengthen the Fisheries Centre’s link with that Department.



Ministry of Environment

The Fisheries Centre houses 12 members of the BC Government, Ministry of Environment Fisheries Science Section. The section conducts research on freshwater fisheries management, fish habitat restoration, fish forestry interactions, and fish culture techniques. In addition, an active focus on conservation biology supports British Columbia's goal of maintaining and enhancing the province's fish and wildlife species and their habitats.

British Columbia has over 200,000 small (<1 ha) lakes, hundreds of larger lakes and wetlands, and thousands of kilometres of rivers and streams. This resource is the basis of a sport fishery for more than 400,000 anglers. In addition, abundant freshwater habitats provide spawning and rearing opportunities for British Columbia's salmon, steelhead and several other fish species native to BC. The province's complex geography and glaciation history produced a province rich in natural resources and biodiversity. Managing these resources in a sustainable manner requires the development of ecosystem-based management tools along with data and Geographic Information Systems that support government and industry decision-making systems.

Freshwater habitat restoration is an area of research where British Columbia has been a world leader. Defining the relationships between habitat structure, nutrient dynamics and growth and survival of juvenile fish populations has allowed for the development of realistic restoration options for several 'at risk' lake and stream-dwelling fish populations.

The partnership between the Province of BC and the Fisheries Centre and other units of the University of British Columbia has resulted in support for hundreds of graduate students as well as fostering a collaborative research environment between government scientists and university faculty for more than 50 years. This association will be of increasing importance as the stresses on our natural environment continue to increase, and the need for science-based decision-making assumes a greater role in government.

www.gov.bc.ca/env



Art Tautz



Dan Hogan



Debbie Aird



Eric Parkinson



Sidney Tsang



Adrian Clarke



Shannon Harris



Bruce Ward



Tom Johnston



Steve McAdam



Jordan
Rosenfeld



Theresa Godin





Quantitative Modeling Group



Carl Walters
Head



Murdoch
McAllister
Associate
Professor



Steve Martell
Assistant
Professor

The Quantitative Modeling Group develops innovative assessment methodologies and field programs intended to improve single species and ecosystem management. The group recently welcomed Dr Murdoch McAllister who will continue to focus on developing and applying Bayesian statistical methods for fisheries risk assessment, estimation, decision analysis and management strategy evaluation. Dr Villy Christensen (see the *Sea Around Us* Project pages) participates in this group working on ecosystem modeling and the further development of Ecopath with Ecosim and Dr Sylvie Guénette works on ecosystem modeling at various scales, from the Gulf of Alaska to the global ocean. Partnerships with colleagues within and outside UBC have generated a continuum of projects ranging from factors affecting species composition in small B.C. lakes to ecosystem management in the Gulf of Mexico.

New and continuing projects in 2006-2007:

- In collaboration with the Fisheries Science Section of the British Columbia Ministry of Environment (see page 5), members of the group are pursuing a number of field-based projects which include investigating recruitment failure and restoration options for white sturgeon, angler effort dynamics in small lake systems as well as meta-population structure and factors affecting species composition within these mixed species small lake systems;
- A further new project with the Ecosystems Branch of the British Columbia Ministry of Environment aims to develop new mark-recapture models to estimate the abundance of Nechako River white sturgeon over the last decade, taking into account also recapture effort data and micro-constituent based covariates for immigration and emigration;
- Members of the group continue to participate in the POST project (www.postcoml.org) exploring the critical issue of downstream migration and early ocean survival of salmonid smolts;
- Projects in collaboration with the US National Marine Fisheries Service in Honolulu (Hawaii) explore assessment and management options for the data-limited Hawaiian bottom fish fishery as well as the influence of meta-population structure on the assessment and management of the Hawaiian lobster fishery;
- Funding from the Natural Sciences and Engineering Research Council of Canada, Elk Valley Coal, the Columbia Basin Trust and BP Canada Energy has facilitated assessment of char and trout populations within the Elk River and tributaries;



Meaghan Darcy with a Hapu'upu caught in the Northwest Hawaiian Islands for age, growth, and maturity samples



- Members collaborate with the Canadian Department of Fisheries and Oceans (DFO) on the joint statistical committee for Pacific hake assessment and have developed simulations to explore the potential effects on wild populations of introduced genetically modified salmonids;
- A commissioned report to DFO reviewed modeling activities of the Fisheries Centre, and in particular the work on the northern and central coast of B.C.;
- A joint project between NOAA, the Virginia Institute of Marine Science and UBC is aimed at developing a stock assessment framework for sub-stocks of Atlantic menhaden in Chesapeake Bay;
- Ongoing studies of the Grand Canyon are aimed at understanding endangered species responses to ecosystem dynamics within regulated systems as well as factors influencing recruitment dynamics, growth, survival, and ontogenetic habitat movement of salmonids;
- A collaborative study with the University of Washington, with Moore Foundation support, examines salmon dynamics in relation to ecosystem change;
- An ecosystem management project for the Gulf of Mexico utilizes Ecopath with Ecosim to explore tradeoffs between commercial and recreational fisheries and impacts of shrimp and menhaden fisheries on other fisheries;
- Individuals participate in a program funded by the Pew Charitable Trusts and the Lenfest Foundation, investigating the issue of dedicated access in global fisheries;
- National Marine Fisheries Service and the Pelagic Fisheries Research Program sponsor a global-scale analysis of the status of large pelagic predators and management options for reducing fishing mortality;
- Recent collaboration with Dr Barbara Block at Stanford University's Hopkins Marine Station has resulted in the development of stock assessment methods for Atlantic bluefin tuna incorporating start and endpoint tag recovery data from conventional and Pop-up Satellite Archival Tag (PSAT) tagging programs. A new project funded by the Lenfest Ocean Program extends this collaboration to develop stock, area, and seasonally-structured stock assessment models that are fitted to PSAT tag track and conventional tagging data records and genetic stock identification of individual tagged fish. Similar stock assessment models that are fitted to similar data for Pacific bluefin tuna are also to be developed;
- In collaboration with University of Washington, University of Florida, and US Geological Survey scientists, improved methods for fitting bioenergetics models to growth data from size-age and tagging studies are being developed; these methods promise to provide better estimation of seasonal changes in metabolic and feeding rates of fish;
- Funding from the UK Game and Wildlife Conservation Trust is directed towards developing Bayesian assessment models to evaluate alternative management strategies for the control of red fox populations in the UK;
- An Environmental Defense funded project aims to develop simulation models to evaluate the potential consequences of alternative harvest management policy options for Gulf of Mexico shrimp fisheries. The models developed will account for several different shrimp species harvested and the seasonal and spatial aspects of shrimp population dynamics and fishery operations. Feed back control policies that are based on annual and possibly in-season stock assessments of the main shrimp populations are also to be evaluated.



Sylvie Guénette
Honorary Research
Associate



Robert Ahrens
Lecturer



Nathan Taylor
Post-doctoral
Fellow





Fisheries Economics Research Unit



Rashid Sumaila
Director



Gordon Munro
Professor
Emeritus

The Fisheries Economics Research Unit (FERU) uses economic tools to address issues related to the management of aquatic resources for the benefit of current and future generations, while maintaining ecosystem integrity.

The past two years have been fantastic, with great achievements on many fronts, notably building on our good publication record. Five students graduated from our unit during this period. Three are currently pursuing their PhDs and one is employed in an international organization. The fifth student completed her PhD before this report was put together. Currently, seven students (six PhDs) are full members of FERU, with several others partially associated with the unit. We have attracted funding from various sources, including national, intergovernmental, and non-governmental organizations. Several members of the unit won awards during the period.

FERU has continued its high-level effort to inform policy makers and the public of the results of its work. We have given lectures worldwide and gave briefings to global leaders on global fisheries. A few examples of high-impact presentations and briefings are listed below:



Rashid Sumaila, WTO Director General Pascal Lamy and Oceana CEO Andrew Sharpless



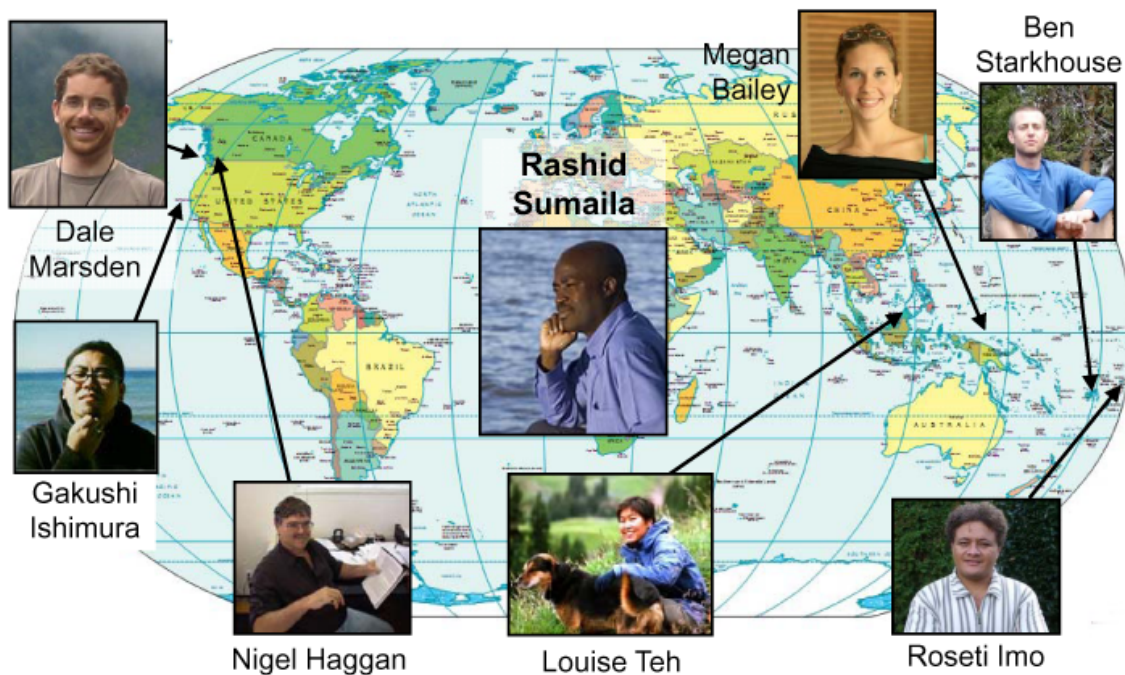
Louise Teh recording fish catches in Pulau Banggi, Malaysia

1. Briefing for G77 Countries of the United Nations entitled "Current state of global fisheries: Implications for developing countries", the United Nations, New York, October 3, 2007.
2. Presentation entitled "Fisheries subsidies: Scope, magnitude and sustainability, at the World Trade Organization, Geneva, May, 2007.
3. Presentation entitled "Globalization, subsidies, illegal fishing and developing countries", Woodrow Wilson International Centre for Scholars, February 22, 2007, Washington, D.C.
4. Presentation entitled "Subsidies to deep-high seas bottom trawl fleet: Magnitude and implications", AAAS Annual Meeting, San Francisco, February 18, 2007.
5. Presentation entitled "Ensuring marine ecosystem services for now and the future", the First Kathryn Fuller Science for Nature Fund Symposium, Washington, DC, October 31 – November 1, 2006.
6. Presentation entitled "A Bottom-up re-estimation of global fisheries subsidies", the World Bank, Washington, D.C., October, 30, 2006.
7. Congressional (Hill) Briefing on "the economics of rebuilding U.S. overfished stocks", June 15, 2006, Washington D.C.;



Our work has generated significant international interest, and has been cited by several print and audio media outlets. Our work has received mention in *The International Herald Tribune*, *Maine Sunday Telegram*, *The Financial Times*, *The Globe and Mail*, *Voice of America*, *CBC News* and *The Vancouver Sun*.

The figure below displays photos of the seven current full time students at FERU, and pinpoints the location of their projects.



- Ben:** Valuation of direct uses of Fiji's coral reef ecosystems
- Louise:** Socio-economic factors that effect small-scale fishing activities
- Nigel:** Incorporating cultural and spiritual values into decision-making
- Dale:** Bioeconomic modeling of Fraser River sockeye salmon
- Gaku:** Bioeconomic and game theoretic model of Pacific sardine
- Megan:** Game-theoretic analysis of resource allocation with multiple objectives
- Roseti:** Spatial modeling of W. Central Pacific tuna



FERU members Gaku Ishimura (bottom right) and Megan Bailey (top) with other students participating in a Game Theory and Fisheries course run by Marko Lindroos at the University of Helsinki



Rashid Sumaila, Ahmed Khan (one of the recently graduated FERU students) and Dale Marsden enjoying time off at the FAME conference in Denmark



Marine Mammal Research Unit



Andrew Trites
Director



Pamela
Rosenbaum
Manager



David Rosen
Research
Associate



Dominic Tollit
Research
Associate



Volker Deecke
Research
Associate



Brian Battaile
Post-doctoral
Fellow

The Marine Mammal Research Unit (MMRU) is an integral component of the Fisheries Centre and works with other departments and institutions, combining specialties in a coordinated effort to provide independent research and advice on matters related to marine mammals. Members investigate interactions between humans and marine mammals, marine mammals as indicators of ecosystem change, and the natural history, biology and conservation of marine mammals. MMRU research focuses on five areas: population dynamics, energetics and physiology, dietary analyses, behaviour and ecology, and simulation modeling. The multi-disciplinary research program contains four components: field studies, captive animal studies, and data analysis and laboratory studies.



Captive animal studies. Nine Steller sea lions housed at the Vancouver Aquarium were used in studies to investigate a number of hypotheses explaining their decline in the wild. Controlled feeding experiments examined the effect of imposed nutritional stress (through changes in food intake or food quality) on aspects of health and hormone balance in individual sea lions. Experiments also tested and refined a number of techniques to detect prey composition via changes in tissue biochemistry. Studies also investigated the auditory capabilities of Steller sea lions to evaluate the potential impact of anthropogenic noise, such as industrial drilling or sonar. Three additional sea lions swam and dove freely while accompanying scientists in the field at the Open Water Research Station in Port Moody, B.C. The Open Water studies investigated diving physiology, energetics, and swimming biomechanics, with the ultimate aim of determining foraging decisions and

food requirements of the wild population. The animals were also used to test and validate a number of technologies that can be used to study the foraging behaviour of sea lions in the wild. Collectively, the captive animal studies are resolving questions concerning the nutritional and energetic consequences for marine mammals facing changes in their environment, including changes in prey availability. The animals are a valuable scientific resource, and are being studied in collaboration with renowned international scientists.



Rod MacVicar
Research
Assistant



Chad Nordstrom
Research
Assistant



David Gummesson
Research
Assistant



Mandy Wong
Research
Assistant



Morgan Davies
Research
Assistant



Rebecca
Barrick
Research
Assistant



Field studies. Field work was undertaken in Alaska, British Columbia and the Antarctic in 2006 and 2007. Research in Alaska focused on killer whale predation, fur seal foraging behaviour, fur seal growth, sea lion diets, and sea lion behaviour (haulout patterns and timing of weaning). Field studies in the Antarctic focused on identifying humpback whale habitat, while those in British Columbia focused on sea lion diets, harbour porpoise feeding behaviour, and humpback whale abundance and foraging ecology.



Edward Gregor
Researcher



Rob Williams
Post-doctoral
Fellow



the eastern North Pacific to determine the relative importance of bottom-up versus top-down factors.

Laboratory analysis. Other studies undertaken in 2006-07 included developing a DNA technique to identify prey from sea lion scats, and assessing whether a relationship exists between diet, stress and population trends and distribution of Steller sea lions. We also continued a collaborative study with the Faculty of Engineering to develop an implantable tag to track sea lions.

Publications and Outreach. MMRU researchers published 40 peer-reviewed papers during the past two years. Administratively, MMRU continued to oversee the North Pacific Universities Marine Mammal Research Consortium, which unites marine mammal research at the Universities of Alaska, British Columbia, Washington, and Oregon State. MMRU also hosts an annual Symposium on B.C. Marine Mammals, which provides a forum for local researchers, members of the fishing industry, ecotourism operators, and the public to meet and discuss current issues and research related to marine mammals in British Columbia. MMRU graduate students participated in the annual symposium of The Society for Marine Mammalogy's Student Chapter, Northwest Region, which includes students from universities in Washington, Oregon, British Columbia, and Alaska.

change in ocean climate was a major driving force in the decline of sea lions. Models were also used to identify Steller sea lion critical habitat, as well as the distribution of key fish species consumed by sea lions — with the ultimate goal of estimating the extent of competition between fisheries and sea lions. Other models estimated seasonal patterns of sea lion growth and consumption, the economic cost to fisheries of marine mammal critical habitat designations, and compared trends in pinniped populations in



Rowenna Flinn
Researcher



Ruth Joy
Biostatistician



Renee LaRoi
Web Designer



Ryan Coatta
Research
Assistant



Wendi Contois
Research
Assistant



Amanda
Vincent
Director



Project Seahorse



Heather
Koldewey
Associate
Director



Jean Marcus
Research
Associate



Janelle Curtis
Research
Associate



Sara Lourie
Research
Associate



Jorma
Neuvonen
Operations
Director

Project Seahorse has a vision of a world in which marine ecosystems are healthy and well managed. In pursuit of this ambition, we weave together many disciplines, nationalities and approaches into programmes that foster sustainable use of the world's coastal marine ecosystems. Our work reaches from fundamental biology and social science through fisheries management to international policy change and outreach.

Seahorses serve as iconic animals for all our work, requiring us to assess and address a myriad of conservation threats of broad general importance. We are active in many countries, but particularly in the Philippines, through our in-country team at the Project Seahorse Foundation for Marine Conservation.

Ever since being founded in 1996, Project Seahorse has been considered the foremost authority in the world on the family of fish that includes 300 species of seahorse, pipefish, seadragon, and pipehorse (Syngnathidae). Members of our team were the first to study seahorses underwater, the first to discover their huge trade, the first to identify the threatened status of seahorses, and the first to launch seahorse conservation measures. Ten years on, knowledge of seahorse biology and identification has greatly advanced, hundreds of professionals are engaged in studying and caring for these fish (supported by our technical networks), tens of millions of people have heard of the fragile state of seahorse populations through our exhibits in public aquariums ... and remedial measures to conserve seahorses are emerging around the world.

True to Project Seahorse intent, our gains for the charismatic seahorses represent gains for many other marine species and systems. We have generated and supported 30 community-managed marine reserves, protecting all species therein. We have fostered an alliance of nearly 1000 of the world's poorest fishing families and helped them find a voice for coastal resource management. We have prompted traditional Chinese medicine practitioners in Hong Kong to adjust purchases of marine life to sustainable levels. We have provoked regulations to monitor incidental capture in shrimp trawls. Our technical advice has led 172 CITES signatory nations to begin regulating the international trade in the first marine fishes of commercial importance, and catalysed development of innovative international management measures that serve multiple species simultaneously.

Project Seahorse is now active in managing small-scale fisheries, reducing bycatch, sustaining marine reserves, empowering women, minimizing risks from aquaculture, advising on sustainable trade, analysing options for syngnathid conservation, and sharing vital information with a wide array of stakeholders. In the Canadian context, we are working with Gitga'at and Huu-ay-aht First Nations (indigenous people) to explore the complementarity of societal and scientific approaches in the design of marine reserves.



Our published research over the past two years has reported on the following analyses *inter alia*:

- The nature and potential impacts of non-food fisheries for aquarium use, traditional medicine, leather, product testing, curios, and pharmaceuticals;
- The benthic status of coral reef fishing grounds and the effectiveness of marine reserves, the latter using our remarkable data set covering multiple reserves and distant control sites for ten years;
- An evolving understanding of seahorse ontogeny, ecology, fisheries and trades, with particular respect to small-scale target fisheries in the Philippines and trawl fisheries in Vietnam;
- The challenges of assuming that aquaculture will address declines in wild fish populations;
- The extent of human impacts on British Columbia's marine environment.

We are very grateful to all our partner organisations and donors, and particularly to the Zoological Society of London (UK), John G. Shedd Aquarium (USA), and Guylian Chocolates (Belgium) for their extraordinary support.

www.projectseahorse.org



Standing from L to R: Grace Gomez, Hazel Panes, Lourdes Labrada, Mia Apurado, Armi Torrechilla, and Angie Nellis. Front Row from L to R: Alen Mondido, Erwin Brunio, Amado Blanco, Pert Auxilio, Alfie Bartolo, and Brian Cabrera.



Mai Yasué
Post Doctoral
Scientist



Eve Robinson
Research
Assistant



Regina Bestbier
Research
Assistant



Sarah Bartnik
Research
Biologist



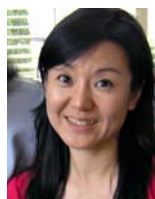
Candace
Picco
Research
Assistant



Keith
Martin-Smith
Research Fellow



Joy TL Lam
Marine
Medicinal
Conservation
Officer



Chloe Shen
Administrative
Manager



Lana
Gunnlaugson
Administrative
Assistant



Shannon Charney
Operations
Assistant



Heidi Shuter
Administrative
Assistant





Sea Around Us Project



Daniel Pauly
Principal
Investigator



Villy
Christensen
Associate
Professor



Reg Watson
Senior
Research
Fellow



Jackie Alder
Senior
Research
Fellow



Dirk Zeller
Senior
Research
Fellow

The Sea Around Us Project, funded by the Pew Charitable Trusts, Philadelphia, started in mid 1999. Its goal remains to investigate the impacts of fisheries on marine ecosystems and to propose policies to mitigate these impacts.

Although conceived as a global activity, the project first emphasized the data-rich North Atlantic as a testing bed for developing its approaches, which rely on mapping of catch data and indicators of ecosystem health derived from the analysis of extended catch time series data. Initial achievements included mapping the decline, throughout the North Atlantic basin, of high-trophic level fishes from 1900 to the present and the presentation of compelling evidence of change in the functioning of the North Atlantic ecosystems. The Central and South Atlantic were the next basins to be tackled, with emphasis on the distant-water fleet off West Africa. The project then emphasized the North Pacific, Antarctica, and marine mammals and the multiplicity of tropical Indo-Pacific fisheries before our scope became global, with all our major analyses and reports (e.g., on the interactions between marine mammals and fisheries, on fuel consumption by fleets, on subsidies to fisheries) based on global studies.

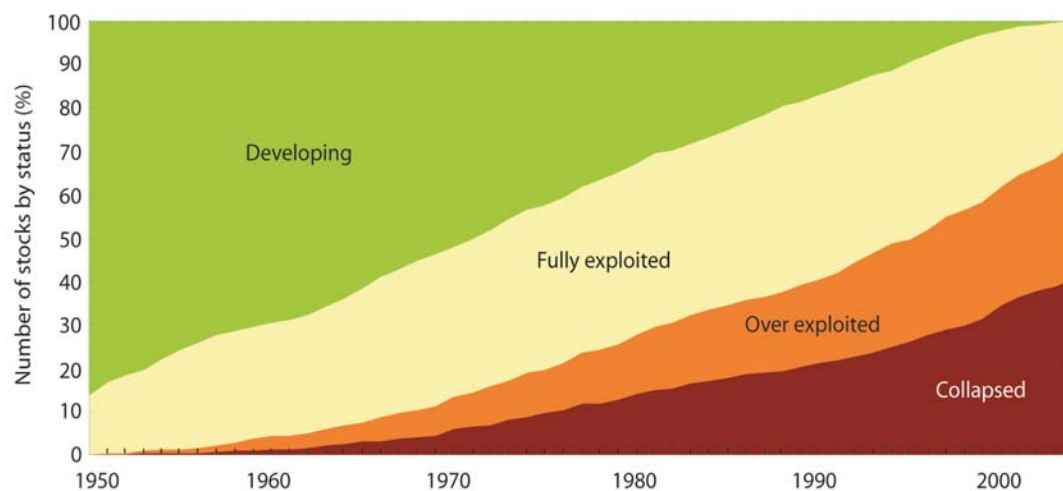
Broadly, our work aims at a reappraisal of fisheries, from the benign activity that many still perceive them to be, to a realization that they have become the driver for massive loss of biodiversity. Moreover, the emphasis on global estimates (rather than local estimates of dubious generality) has allowed the project to contribute to various global initiatives (e.g., developing the Marine Trophic Index for the Convention on Biological Diversity; quantifying marine ecosystem services for the Millennium Ecosystem Assessment; supplying various datasets to UNEP's Fourth Global Environment Outlook; and co-authoring major syntheses by other research groups).

In the 2006 and 2007 period, the *Sea Around Us* Project completed major activities, among others:

- The 'forage fish' project, which demonstrated that the role of anchovies, sardines, etc., presently mostly reduced to fishmeal for intensive food production, must be reconsidered, in view of their role as prey of marine mammals and seabirds, and as much-appreciated food for people in many countries;
- The launching of SeaLifeBase (www.sealifebase.org), a database on the biology and ecology of non-fish marine organisms, funded by the Oak Foundation, and which will complement FishBase (www.fishbase.org) in making information relevant to marine ecosystem modeling available to a wide range of users;
- The evaluation of all catches, from 1950 to the present, by the inshore fisheries of Hawaii and the US Flag territories in the Pacific (Guam, American Samoa, etc), which are much higher than officially reported;
- The related estimation of total catches from the Arctic, and a number of countries throughout the world, which suggests that the FAO statistics systematically underestimate fisheries catches, particularly for small-scale fisheries, thus biasing policy decisions relying on such data (e.g., fishing access agreements);



- An assessment of the status of fisheries and ecosystem 'health' in each of the 64 Large Marine Ecosystems presently recognized in the world (see figure below);
- The estimation of global subsidies to fisheries (together with FERU, see p. 8-9), which are higher than previously assessed, e.g., by the World Bank, and which mainly have a very negative impact on fisheries resources;
- The release of a new, reprogrammed version of Ecopath with Ecosim, in the context of an activity funded by the Lenfest Ocean Program, and which gives a new lease on life to this widespread ecosystem modeling tool, celebrated in 2007 as one of the "Top 10 Achievements" by the US National Marine Fisheries Service.



Status of the fisheries 'stocks' in the 64 Large Marine Ecosystems of the world, showing the steadily increasing number of overfished or collapsed stocks.

Also, we have initiated the revamping of the Project website (www.seaaroundus.org), our main tool for providing maps and other quality information on marine fisheries and ecosystems to a wide range of users.

These results and their dissemination through public lectures and policy briefings, and by staff of non-governmental organizations (our main 'clients') generated, in 2006-2007, a growing media attention for the *Sea Around Us* Project.

Other activities initiated in 2007, which will come to fruition in 2008, include the development of indicators for ranking maritime countries in terms of how well they manage the fisheries and biodiversity in their Exclusive Economic Zones, modeling studies of how dioxin and other pollutants get distributed over the oceans, then move up in marine food webs, and how global warming will affect the distribution of marine resource species.

www.seaaroundus.org



Maria Lourdes Palomares
Research Fellow



William Cheung
Post-doctoral Fellow



Christopher Close
GIS & Database Manager



Arash Tavakolie
Senior .NET Developer



Shawn Booth
Research Assistant



Grace Ong
Administration



Joe Hui
Programmer



Sherman Lai
Programmer



Suzanne Mondoux
Research Assistant



Brooke Campbell
Research Assistant



Vicky Lam
Research Assistant



Jordan Beblow
Research Assistant





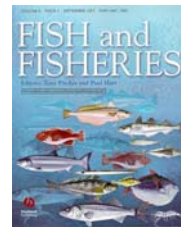
Fisheries Ecosystems Restoration Research



The Fisheries Ecosystems Restoration Research (FERR) group researches integrative tools for ecosystem-based management (EBM) and practical policies for the restoration of aquatic ecosystems. Using fieldwork, community involvement and innovative modelling, the FERR team aims to help estimate, mitigate and reverse human impacts, establishing policy goals that reconcile the preservation of biodiversity and services with sustainable and responsible fisheries, pioneering new techniques in restoration ecology for key marine and freshwater ecosystems around the globe. These include 'Back to the Future', a new approach to policy that maximises sustainable future benefits in the face of risks from climate fluctuations and change; 'Rapfish', a rapid appraisal method for evaluating the sustainability of fisheries, illegal, unreported and unregulated catches, and compliance with the UN Code of Conduct for Responsible Fisheries;

and an Ecosystem Evaluation Framework (EEF) which systematises knowledge of the form and function of some specific aquatic ecosystems, such as coral reefs, ice fronts and seamounts. A methodological emphasis is upon Monte Carlo estimations and fuzzy logic to deal with uncertainty. During this period, Nedzad Adjanovic (Bosnia & FAO), Jim Cannon (Sustainable Fisheries Partnership), Patricia Rojo-Diaz (Mexico) and Georg Skaret (Norway) were research collaborators with FERR.

In 2007, *Fish and Fisheries*, a Blackwell journal edited by Tony Pitcher, had by a large margin the top impact factor of all journals in its field for the second year running. Dr Pitcher has been awarded a one-year position as Distinguished Scholar in Residence at the Peter Wall Institute for Advanced Studies.



Dr Daniela Kalikoski (Brazil & FAO) has been working with FERR on Code of Conduct compliance and IUU projects, and has a research focus on fisheries co-management, community-based management, and traditional ecological knowledge.

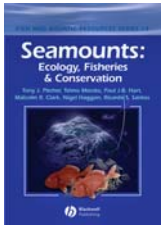
Dr Cameron Ainsworth (Canada) has been a Post Doctoral Fellow working on modelling in support of EBM of coral reefs in Raja Ampat, West Papua, Indonesia, part of the 'coral triangle'. The work, which is funded by Packard and is jointly with The Nature Conservancy and Conservation International, has included two periods of fieldwork and workshops in Indonesia. He has now joined an ecosystem modelling team using the CSIRO modelling system 'Atlantis' at NOAA, Seattle.



Dr William Wai Lung Cheung (Hong Kong) defended his thesis evaluating the vulnerability of marine fishes to fishing using a fuzzy logic expert system. A South China Sea case study used ecosystem simulation models to explore trade-offs between socio-economic and conservation objectives. After a temporary teaching position at the University of Hong Kong, Dr Cheung has joined the *Sea Around Us* Project team as a postdoc. A recent paper was a featured article in *Marine Ecology Progress Series*.

Dr Hector Lozano (Mexico) completed his thesis on historic modelling of the Colorado River Delta and the Upper Gulf of California using fishery data, archives, and Local Ecological Knowledge (LEK). He has left to work on ecosystem modelling with CSIRO, Australia. Hector was awarded the 2003 Cecil and Kathleen Morrow Travel Scholarship.





Dr Telmo Morato (Portugal) completed his thesis on seamount fisheries and ecology supported by an EU Scholarship, and has returned to the Azores Islands, Portugal as a European Union postdoc. With Dr Pitcher, he has recently co-edited an important new Blackwells book on seamounts.



Eny Buchary (Ph.D. Candidate: Indonesia) has been analysing the results of her IDRC-sponsored fieldwork in the Bali Strait, Indonesia. Eny's research uses local knowledge obtained through interviews to evaluate policy options and local stakeholder perceptions for marine management.



Robyn Forrest (Ph.D. Candidate: Australia) has been supported by NSW government to develop marine ecosystem models of New South Wales to assist EBM, evaluate trade-offs in protecting vulnerable species such as sharks, and examine marine protected areas. Robyn was awarded the 2005 Cecil and Kathleen Morrow Travel Scholarship to assist her comparison of Ecopath with Ecosim with the CSIRO modelling system 'Atlantis'.

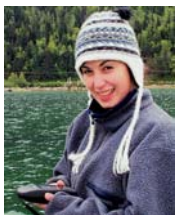


Pramod Ganapathiraju (Ph.D. Candidate: India) has helped to complete the evaluation of 53 countries for compliance with the UN Code of Conduct for Responsible Fishing, and is also working on the estimation of illegal and unreported fishing. Pramod was awarded the 2006 Cecil and Kathleen Morrow Travel Scholarship and has been funded by *Sea Around Us* Project, WWF and the UK Government.



Carie Hoover (Ph.D. Candidate: USA) is currently working on an ecosystem model and EEF of the Antarctic Peninsula with special reference to krill and top predators, while considering the potential effects of climate change on polar habitats and ecosystems. She has recently commenced work on Hudson Bay funded by the International Polar Year, and so her thesis will include comparisons between the two polar ecosystems.

Rajeev Kumar (Ph.D. Candidate: India) is working on ecosystem modeling of Mille Lacs Lake for ecosystem-based management funded by the Minnesota Department of Natural Resources (DNR). The model is supported by extensive DNR fieldwork using electro-fishing, gill netting, trawling and invertebrate and plankton sampling.



Megan Moody (M.Sc. student: Nuxalk Nation, Canada) is evaluating the status and past abundance of eulachon throughout its Pacific Northwest range using a novel fuzzy logic approach. As a member of the Nuxalk Nation, she has called on the traditional ecological knowledge (TEK) of her community to enrich our knowledge of past abundances.

Lydia Teh (Ph.D. Candidate: Canada) is working on fisher behaviour and MPA establishment in Sabah, Malaysia. During recent field work, a group of artisanal fishers have been equipped with GPS and logbooks to record daily catches and locations.



Dawit Tesfamichael (Ph.D. Candidate: Eritrea) is examining the past, present and future of Red Sea fisheries using evaluation and modelling techniques of Rapfish, ecosystem modelling, and the estimation of illegal, unreported and unregulated catch. In 2007 he has undertaken extensive field work in the region.

Divya Varkey (Ph.D. Candidate: India) is building ecosystem models of coral reef fisheries as part of a Packard-sponsored EBM project in Raja Ampat, West Papua, Indonesia. In addition she has commenced new work on historical reconstruction. Divya was awarded a UBC UGF scholarship in 2007.



Graduate Studies

Graduate students at the Fisheries Centre are an incredibly diverse group, all working towards the same goal of 'reconciling fisheries with conservation'. The 49 PhD and 29 MSc students at the FC in 2006-2007 came from at least 25 countries, including Australia, Brazil, Canada, China, Eritrea, Ethiopia, France, Greece, India, Indonesia, Italy, Japan, Malaysia, Malta, Mexico, Niger, Philippines, Portugal, Samoa, Sierra Leone, Singapore, Thailand, Trinidad & Tobago, the United Kingdom, and the USA. As the Fisheries Centre itself doesn't admit students, they were admitted to UBC Graduate Studies through other departments, primarily Resource Management and Environmental Studies (RMES) and Zoology, but also Geography and Earth and Ocean Sciences. Over the past two years, RMES and Zoology have provided a second home to 52 and 43% of FC students, respectively.



Students' research covers a wide range of topics, falling under a variety of disciplines (sometimes more than one). Thesis topics include understanding species life history and population dynamics of key resource species; fisheries, ecosystem and bioeconomic modeling; quantifying the impacts of overfishing, non-selective fisheries and climate change; evaluating possible mitigation tools and policy options; historical reconstructions and future projections of populations and catches; and economic valuations.

In addition to their research efforts, students play an important role in the day to day life of the Fisheries Centre. They organize the weekly seminar series and coffee breaks, help out with events such as the biennial Larkin Lecture and holiday celebrations, coordinate building-wide composting, edit FishBytes and the newsletters of various groups, and coordinate fora for discussion. Thanks to the FC Director's encouragement, a few students now act as student representatives to their peers, thereby ensuring that students' interests are considered in all decision making.

Fisheries Centre students are known to tackle rather ambitious projects that often involve travel to far parts of the globe. In the field, students gain hands-on experience with the fauna, fishery, system or otherwise that is the focus of their research, and an increased understanding of the implications of their work for all stakeholders involved. Engaging in such projects has allowed students to make strong connections with their global peers, working alongside NGOs, local communities and scientists. Despite the diversity of students' research and field sites, the overarching perspective echoes the Fisheries Centre's goal to reconcile fisheries and conservation.

To achieve its goal, the Fisheries Centre promotes the multidisciplinary study of fisheries, and aims to provide its graduate students with a strong background in quantitative aspects of fishery science and in all aspects of aquatic conservation biology. Analytical tools developed in a broad spectrum of parent subjects, including biology, oceanography, economics, engineering, mathematics, sociology, planning and policy are employed in order to assess, appraise and forecast the impacts of both human and natural processes on fishery resources. Fisheries policy and management problems under study include assessment and management of artisanal and commercial food capture fisheries, recreational fisheries, coastal and watershed management, aquaculture biology and engineering, conflict resolution and the co-management of shared fishery resources, and the conservation of endangered exploited species in both marine and freshwater environments. Faculty members teach a number of graduate credit courses, on such topics as quantitative analysis and modeling, economics, and aquatic policy. These FISH courses are detailed on the graduate program web page www.fisheries.ubc.ca/grad.



Graduate Students



Robert Ahrens (Canada)

PhD Zoology (start 2004)

Project: Global analysis of apparent trends in abundance and recruitment of tunas and billfish vulnerable to pelagic longline gear.

Supervisors: Dr Carl Walters & Dr Villy Christensen



Ella Bowles (Canada)

MSc Zoology (start 2007)

Project: Quantifying Steller sea lion diet using real-time PCR

Supervisors: Dr Andrew Trites & Dr Trish Schulte



Cameron Ainsworth (Canada)

PhD RMES (start 2002*)

Project: Strategic ecosystem restoration in northern British Columbia

Supervisor: Dr Tony Pitcher



Lucas Brotz (Canada)

MSc Oceanography (start 2007)

Project: Trends in global jellyfish populations

Supervisors: Dr Daniel Pauly & Dr Evgeny Pakhomov



Pamela Allen (Canada)

MSc Zoology (start 2006)

Project: Quantifying seasonal changes in growth and consumption of Steller sea lions from captive records

Supervisor: Dr Andrew Trites



Eny Buchary (Indonesia)

PhD RMES (start 2001)

Project: In search of viable policy options for responsible use of marine resources in the Bali Strait, Indonesia

Supervisor: Dr Tony Pitcher



Jonathan Anticamara (Philippines)

PhD RMES (start 2002)

Project: Ecology and implications of recovering degraded reef communities within no-take marine reserves

Supervisor: Dr Amanda Vincent



Iain Caldwell (Canada)

PhD Zoology (start 2006)

Project: Movement of a sedentary fish in response to environmental change

Supervisor: Dr Amanda Vincent



Megan Bailey (Canada)

MSc RMES (start 2005*)

Project: A total economic valuation of the Raja Ampat Archipelago in Papua Indonesia

Supervisor: Dr Rashid Sumaila



Brooke Campbell (Canada)

MSc RMES (start 2007)

Project: Global marine shrimp catch and aquaculture production in estuaries

Supervisor: Dr Daniel Pauly



Natalie Ban (Canada)

PhD RMES (start 2003)

Project: Selecting ecologically and socially viable marine protected areas in British Columbia

Supervisor: Dr Amanda Vincent



William Cheung (Hong Kong, China)

PhD RMES (start 2002*)

Project: Vulnerabilities of marine fishes in the north South China Sea and implications to fisheries management

Supervisor: Tony Pitcher



Brajgeet Bhathal (India)

PhD Zoology (start 2005)

Project: Analysis of fishing impacts on India's marine ecosystems and exploration of possible policy scenario

Supervisor: Dr Daniel Pauly



Line Bang Christensen (Denmark)

MSc RMES (start 2004*)

Project: Reconstructing historical abundances of exploited marine mammals at the global scale

Supervisor: Dr Steve Martell



Louise Blight (Canada)

PhD Zoology (start 2007)

Project: Using stable isotope analysis to compare ancient and modern change events in marine foodwebs

Supervisor: Dr Amanda Vincent



Sarika Cullis-Suzuki (Canada)

MSc Zoology (start 2006)

Project: Effectiveness of regional fisheries management organizations

Supervisor: Dr Daniel Pauly





Luciano Dalla Rosa (Brazil)
PhD Zoology (start 2003)
Project: Habitat modeling of humpback whales in British Columbia and the Antarctic
Supervisors: Dr John Ford & Dr Andrew Trites



Meaghan Darcy (USA)
PhD Zoology (start 2005)
Project: Management strategy evaluation for a multi-species, multi-sector fishery in the Hawaiian Islands
Supervisor: Dr Steve Martell



Robyn Forrest (Australia)
PhD RMES (start 2002)
Project: Simulation models for strategic E-B decision-making in the data-limited fisheries of New South Wales, Australia
Supervisor: Dr Tony Pitcher



Sarah Foster (Canada/New Zealand)
PhD RMES (start 2004)
Project: Assessing the impacts of shrimp trawling on small fish species
Supervisor: Dr Amanda Vincent



Pramod Ganapathiraju (India)
PhD RMES (start 2005)
Project: A global study on incentives and disincentives to IUU fishing and compliance with the FAO Code of Conduct
Supervisor: Dr Tony Pitcher



Ahmed Gelchu (Ethiopia)
PhD RMES (start 2001*)
Project: Evolution and distribution of global fishing effort
Supervisor: Dr Daniel Pauly



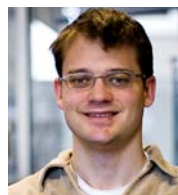
Eli Guieb (Philippines)
PhD McGill (start 2002)
Project: Cultural issues behind marine protected areas
Supervisors: Dr Amanda Vincent & Dr Colin Scott & Dr Monica Mulrennan



Nigel Haggan (Northern Ireland)
PhD RMES (start 2006)
Project: Mapping cultural and spiritual values of coastal ecosystems
Supervisor: Dr Rashid Sumaila



Anna Hall (Canada)
PhD Zoology (start 2004)
Project: Effects of tidal mixing on porpoise distribution: Implications for foraging
Supervisor: Dr Andrew Trites



Mike Hawkshaw (Canada)
MSc Zoology (start 2005)
Project: Cyclic recruitment variation in juvenile Northern pikeminnow
Supervisor: Dr Carl Walters



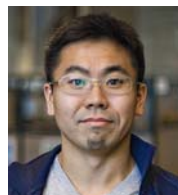
Carie Hoover (USA)
PhD RMES (start 2006)
Project: Polar ecosystem modeling with respect to climate change
Supervisor: Dr Tony Pitcher



Tabitha Hui (Singapore)
MSc Zoology (start 2007)
Project: Competition between fisheries and the Steller sea lion
Supervisor: Dr Andrew Trites



Roseti Imo (Samoa)
PhD RMES (start 2006)
Project: Spatial policy analysis for albacore management in the western central Pacific
Supervisor: Dr. Rashid Sumaila



Gakushi Ishimura (Japan)
PhD RMES (start 2004)
Project: Economic analysis of Pacific sardine fisheries
Supervisor: Dr. Rashid Sumaila



Jennifer Jacquet (USA)
PhD RMES (start 2005)
Project: Fish as food in an age of globalization
Supervisor: Dr Daniel Pauly



Tiphaine Jeanniard du Dot (France)
MSc Zoology (start 2004*)
Project: Impacts of diet quality and season on the physiology of Steller sea lions during and after nutritional stress.
Supervisors: Dr Andrew Trites & Dr David Rosen





Vasiliki Karpouzi (Greece)
 PhD RMES (start 2006)
Project: Global issues in seabird conservation [withdrew December 2007]
Supervisor: Dr Daniel Pauly



Aaron Keech (USA)
 MSc Zoology (start 2005)
Project: Analyses of corticosterone and triiodothyronine hormones to assess nutritional stress in Steller sea lions
Supervisor: Dr Andrew Trites



Heather Keith (Canada)
 MSc RMES (start 2003*)
Project: Bioeconomic analysis of the purse seine and longline tuna fisheries
Supervisor: Dr Rashid Sumaila



Ahmed Khan (Sierra Leone)
 MSc RMES (start 2004*)
Project: The nature and magnitude of global fishery subsidies
Supervisor: Dr Rashid Sumaila



Josh Korman (Canada)
 PhD Zoology (start 2005)
Project: Factors in influencing recruitment dynamics, growth, survival, and ontogenetic habitat movement of salmonids in large river systems
Supervisors: Dr Steve Martell & Dr Carl Walters



Rajeev Kumar (India)
 PhD RMES (start 2006)
Project: Simulation modeling of Mille Lacs Lake ecosystems in support of EBM
Supervisor: Dr Tony Pitcher



Pamela Lestenkof (USA)
 MSc Zoology (2004)
Project: Fine scale diving behaviour of lactating northern fur seals
Supervisor: Dr Andrew Trites



Yajie Liu (China)
 PhD RMES (start 2001*)
Project: The net benefits from aquaculture
Supervisor: Dr Rashid Sumaila



Rachael Louton (USA)
 PhD Zoology (start 2007)
Project: Evaluation of alternative management regimes for shrimp fisheries in the Gulf of Mexico
Supervisor: Dr Murdoch McAllister



Hector Lozano (Mexico)
 PhD Zoology (start 2001*)
Project: Historical ecosystem reconstructions in the Gulf of California (Mexico)
Supervisor: Dr Tony Pitcher



Michelle Marcotte (Canada)
 MSc Zoology (start 2004*)
Project: Weaning behaviour and haulout pattern of Steller sea lions in southeast Alaska
Supervisor: Dr Andrew Trites



Dale Marsden (Canada)
 PhD RMES (start 2003)
Project: Bioeconomic analysis of Fraser River sockeye salmon fisheries management
Supervisor: Dr Rashid Sumaila



Steve McAdam (Canada)
 PhD Zoology (start 2005)
Project: Examination of white sturgeon (*Acipenser transmontanus*) recruitment failure and identification of restoration options
Supervisor: Dr Carl Walters



Michael Melnychuk (Canada)
 PhD Zoology (start 2004)
Project: Ecology of juvenile salmon river and early ocean migrations: Assessment of mortality patterns with active and passive acoustic telemetry
Supervisor: Dr Carl Walters



Elizabeth Mohammed (Trinidad & Tobago)
 PhD RMES (start 1999)
Project: Reconstructing the southeastern Caribbean ecosystem: applications for assessment and management [withdrew December 2007]
Supervisor: Dr Daniel Pauly



Megan Moody (Canada)
 MSc RMES (start 2004)
Project: Historical analysis of current and past Pacific Coast eulachon status and the possible reasons for its decline
Supervisor: Dr Tony Pitcher





Telmo Morato (Portugal)
PhD RMES (start 2002*)
Project: Ecology and fisheries of seamount ecosystems
Supervisor: Dr Tony Pitcher



David Preikshot (Canada)
PhD RMES (start 2000*)
Project: The influence of area scale climate and trophic dynamics upon North Pacific oceanic ecosystem models
Supervisors: Dr Villy Christensen & Dr Daniel Pauly



Siân Morgan (Canada)
PhD McGill (visiting from McGill University since 2003*)
Project: The ontogenetic ecology and conservation of exploited tropical seahorses
Supervisors: Dr Amanda Vincent & Dr Donald Kramer (McGill)



Andrea Rambeau (Canada)
MSc Zoology (start 2006)
Project: Defining parameters for a migrating, intermixing population of humpback whales in British Columbia
Supervisors: Dr Andrew Trites & Dr John Ford



Lyne Morissette (Canada)
PhD Zoology (start 2001*)
Project: Quality of ecosystem models and their impact on resilience: a comparative analysis
Supervisor: Dr Daniel Pauly



Erin Rechisky (USA)
PhD Zoology (start 2004)
Project: Early marine survival and migration of endangered Pacific salmon in the Columbia and Fraser Rivers
Supervisor: Dr Carl Walters



Kerrie O'Donnell (USA)
PhD Zoology (start 2005)
Project: Evaluating recovery options for data-limited seahorse fisheries in the Philippines
Supervisor: Dr Amanda Vincent



Yvette Rizzo (Malta)
PhD RMES (start 2000)
Project: The central Mediterranean: functioning of a large marine ecosystem [on leave from project]
Supervisor: Dr Daniel Pauly



Marivic Pajaro (Philippines)
PhD RMES (start 2002)
Project: Biological, social and economic indicators of effectiveness in community-managed marine protected areas
Supervisor: Dr Amanda Vincent



Jennifer Selgrath (USA)
PhD Zoology (start 2006)
Project: Ecosystem resilience in coastal fishing grounds
Supervisor: Dr Amanda Vincent



Chiara Piroddi (Italy)
MSc Zoology (start 2005)
Project: The application of Ecopath with Ecosim to the study of two populations of dolphins in the Eastern Ionian Sea, Greece
Supervisor: Dr Villy Christensen



Ben Starkhouse (USA)
MSc RMES (start 2006)
Project: Quantifying and valuing extractive resources of Fiji's coral reefs
Supervisor: Dr Rashid Sumaila



Tom Porteus (UK)
PhD Zoology (start 2006)
Project: Use of Bayesian methods to determine strategy for control of terrestrial vertebrate pest species
Supervisor: Dr Murdoch McAllister



Nathan Taylor (Canada)
PhD Zoology (start 2001*)
Project: Pikeminnows and rainbow trout
Supervisor: Dr Carl Walters



Louise Teh (Malaysia)
MSc RMES (start 2003*), PhD RMES (start 2007)
Project: Investigating the discount rates of small-scale fishers in the Sulu-Sulawesi Marine ecoregion
Supervisor: Dr Rashid Sumaila





Lydia Teh (Malaysia)
 PhD RMES (start 2007)
Project: Zoning MPAs using a fuzzy logic system: case study of small-scale reef fisheries in Sabah, Malaysia
Supervisor: Dr Tony Pitcher



Dawit Tesfamichael (Eritrea)
 PhD RMES (start 2002)
Project: Ecosystem based fisheries management of the Red Sea
Supervisors: Dr Daniel Pauly & Dr Tony Pitcher



Laura Tremblay-Boyer (Canada)
 MSc Zoology (start 2007)
Project: Magnitude and spatial distribution of global fisheries by-catch
Supervisor: Dr Daniel Pauly



Pablo Trujillo (Canada)
 MSc RMES (start 2001*)
Project: Global analysis of the sustainability of marine aquaculture
Supervisor: Dr Daniel Pauly



Brett van Poorten (Canada)
 PhD Zoology (start 2005)
Project: Effects of interspecific competition on recruitment processes in rainbow trout and Pygmy Pike minnow
Supervisor: Dr. Carl Walters



Divya Varkey (India)
 PhD RMES (start 2005)
Project: Ecosystem modelling of coral reefs in Raja Ampat
Supervisor: Dr Tony Pitcher



Colette Wabnitz (France/Germany)
 PhD Geography (start 2003)
Project: The ecological role of green sea turtles and the mapping of their foraging grounds in the wider Caribbean region.
Supervisors: Dr Daniel Pauly & Dr Brian Klinkenberg



Chad Wilkinson (Canada)
 MSc Zoology (start 2005)
Project: Population study on west-slope cutthroat trout and bull trout in a closed river system of the southern BC Rockies
Supervisor: Dr Steve Martell



Mandy Wong (Canada)
 MSc Zoology (start 2007)
Project: Do El Niño-southern oscillation events positively affect the diet of the Hawaiian monk seal
Supervisors: Dr Andrew Trites & Dr Dominic Tollit



Louisa Wood (UK)
 PhD Geography (start 2003*)
Project: A global analysis of marine protected areas
Supervisors: Dr Daniel Pauly & Dr Brian Klinkenberg



Beth Young (USA)
 MSc Zoology (start 2007)
Project: The ability of heart rate to predict metabolism in Steller sea lions
Supervisors: Dr Andrew Trites & Dr David Rosen



Graduate Theses Completed*

2007

Megan Bailey (Canada)

MSc Resource Management and Environmental Studies

Title: Economic analysis of unregulated and illegal fishing in Raja Ampat, Indonesia

Supervisor: Dr Rashid Sumaila

William Cheung (Hong Kong, China)

PhD Resource Management and Environmental Studies

Title: Vulnerabilities of marine fishes in the north South China Sea and implications to fisheries management

Supervisor: Dr Tony Pitcher

Tiphaine Jeanniard du Dot (Canada)

MSc Zoology

Title: Diet quality and season affect physiology and energetic priorities of captive Steller sea lions during and after periods of nutritional stress

Supervisor: Dr Andrew Trites & Dr David Rosen

Ahmed Khan (Sierra Leone)

MSc Resource Management and Environmental Studies

Title: The nature and magnitude of global fisheries subsidies

Supervisor: Dr Rashid Sumaila

Yajie Liu (China)

PhD Resource Management and Environmental Studies

Title: An analysis of the management and economics of salmon aquaculture

Supervisor: Dr Rashid Sumaila

Telmo Morato (Portugal)

PhD Resource Management and Environmental Studies

Title: Ecology and fisheries of seamount ecosystems

Supervisor: Dr Tony Pitcher

Siân Morgan (Canada)

PhD McGill

Title: The ontogenetic ecology and conservation of exploited tropical seahorses

Supervisors: Dr Amanda Vincent & Dr Donald Kramer (McGill)

Lyne Morissette (Canada)

PhD Zoology

Title: Complexity, cost and quality of ecosystem models and their impact on resilience: a comparative analysis, with emphasis on marine mammals and the Gulf of St. Lawrence

Supervisor: Dr Daniel Pauly

David Preikshot (Canada)

PhD Zoology

Title: The influence of area scale climate and trophic dynamics upon North Pacific oceanic ecosystem models

Supervisors: Dr Villy Christensen & Dr Daniel Pauly

Pablo Trujillo (Canada)

MSc Resource Management and Environmental Studies

Title: A global analysis of the sustainability of marine aquaculture

Supervisor: Dr Daniel Pauly

Louisa Wood (UK)

PhD Geography

Title: The global network of maritime protected areas: developing baselines and identifying priorities

Supervisors: Dr Daniel Pauly & Dr Brian Klinkenberg

2006

Cameron Ainsworth (Canada)

PhD Resource Management and Environmental Studies

Title: Strategic marine ecosystem restoration in northern British Columbia

Supervisor: Dr Tony Pitcher

Line Bang Christensen (Denmark)

MSc Resource Management and Environmental Studies

Title: Reconstructing historical abundances of exploited marine mammals at the global scale

Supervisor: Dr Steve Martell

Ahmed Gelchu (Ethiopia)

PhD Resource Management and Environmental Studies

Title: Growth and distribution of port-based global fishing effort within countries EEZs

Supervisor: Dr Daniel Pauly

Heather Keith (Canada)

MSc Resource Management and Environmental Studies

Title: A bioeconomic model approach to predicting the spatial fishing effort distribution in the global longline tuna fishery

Supervisor: Dr Rashid Sumaila

Hector Lozano (Mexico)

PhD Zoology

Title: Historical ecosystem modelling of the upper Gulf of California (Mexico): following 50 years of change

Supervisor: Dr Tony Pitcher

Michelle Marcotte (Canada)

MSc Zoology

Title: Steller watch: timing of weaning and seasonal patterns in numbers and activities of Steller sea lions (*Eumetopias jubatus*) at a year-round haulout site in southeast Alaska

Supervisor: Dr Andrew Trites

Nathan Taylor (Canada)

PhD Zoology

Title: Growth and survival responses to experimental fishing: models, experiments and lessons from the pygmy pikeminnow of south central British Columbia

Supervisor: Dr Carl Walters

Louise Teh (Malaysia)

MSc Resource Management and Environmental Studies

Title: The ecological and socio-economic sustainability of the reef fisheries of PulauBanggi, Sabah, Malaysia

Supervisor: Dr Rashid Sumaila



Fisheries Centre Members

Faculty

Dr Daniel Pauly, Director

Professor, Fisheries Centre & Zoology
Tropical and Global Fisheries Issues

Dr Villy Christensen

Associate Professor, Fisheries Centre
Ecosystem Modeling

Dr Steven Martell

Assistant Professor, Fisheries Centre
Quantitative Fisheries Stock Assessment

Dr Murdoch McAllister

Associate Professor, Fisheries Centre
Bayesian Statistical Methods

Dr Tony J. Pitcher

Professor, Fisheries Centre & Zoology
Ecosystems, Rapid Appraisal and
Schooling

Dr U. Rashid Sumaila

Associate Professor, Fisheries Centre
Fisheries Economics

Dr Andrew Trites

Professor, Fisheries Centre
Marine Mammals and Fisheries

Dr Amanda Vincent

Associate Professor, Fisheries Centre
Canada Research Chair in Marine
Conservation

Dr Carl Walters

Professor, Fisheries Centre & Zoology
Modeling, Assessment and Ecosystems

Associated UBC Faculty

Dr Jo-Ann Archibald

First Nations House of Learning
Aboriginal Issues & Education

Dr Brian Elliot

Sociology
Environmental Sociology

Dr Douglas Harris

Law
Fisheries Law

Dr Scott Hinch

Forest Sciences and Institute for
Resources and Environment
Forests and Fisheries

Dr David (Ralph) Mathews

Sociology
Fisheries Sociology

Dr Charles Menzies

Anthropology
Fisheries Anthropology

Dr Diane Newell

History
History of Fishers Communities

Dr Richard Paisley

Law
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Fisheries Centre Visitors

Listed below are some of the visitors to the UBC Fisheries Centre in 2006-2007 (with the name of the sponsor). These and many other Canadian and international visitors came to present seminars, attend workshops and collaborate with FC researchers.

Patrizia Abdallah

Federal University of Rio Grande, Brazil

Host: Rashid Sumaila

Francisco Arreguin-Sanchez

Centro Interdisciplinario de Ciencias

Marinas del IPN

La Paz, BCS, Mexico

Host: Villy Christensen

Matt Berman

Professor

University of Alaska, USA

Host: Rashid Sumaila

Barbara Block

Tuna Research and Conservation Center

Stanford University, USA

Host: Murdoch McAllister

Jannike Falk-Petersen

PhD Student

University of Tromsø, Norway

Hosts: Steve Martell, Rashid Sumaila,

Villy Christensen

Michael Frisk

Post Doc

State University of New York

Long Island NY, USA

Host: Steve Martell

Didier Gascuel

President

Departement Halieutique

Agrocampus Rennes - Ensar, France

Host: Daniel Pauly

Olaf Jensen

PhD student

Center for Limnology

Madison WI, USA

Host: Steve Martell

Michael Jones

Professor

Fisheries and Wildlife

Michigan State University, USA

Hosts: Amanda Vincent &

Carl Walters

Dr. Hiroyuki Kurota

National Research Institute of Far Seas

Fisheries Shimizu, Japan

Host: Murdoch McAllister

Kelly Kearney

PhD Student

Princeton University, USA

Host: Villy Christensen

Kate Newman

World Wildlife Fund, USA

Host: Rashid Sumaila

Mr. Jin-Hak Noh

Deputy Director

Ministry of Maritime Affairs and

Fisheries, Korea

Host: Daniel Pauly

Alfredo T. Ortega

Centro Universitario de la Costa Sur

Universidad de Guadalajara, Mexico

Host: Daniel Pauly

Katja Parkkila

PhD Student

University of Helsinki, Finland

Host: Rashid Sumaila

Maddy Sigrist

Visiting Scientist

NOAA Chesapeake Bay, USA

Host: Villy Christensen

Maria Villanueva

Post Doc

IFREMER, France

Host: Villy Christensen

Rebecca Whitlock

PhD Student

Imperial College, UK

Host: Murdoch McAllister

Chien-Cheng Yeh

Trustee

Kuroshio Ocean Education Foundation,
Taiwan

Host: Amanda Vincent



This photo includes speakers and organizers of the "Thinking Big – A Global Look at Fisheries Science" Symposium held in honour of FC Director Dr. Daniel Pauly on the occasion of his 60th birthday, May 2006

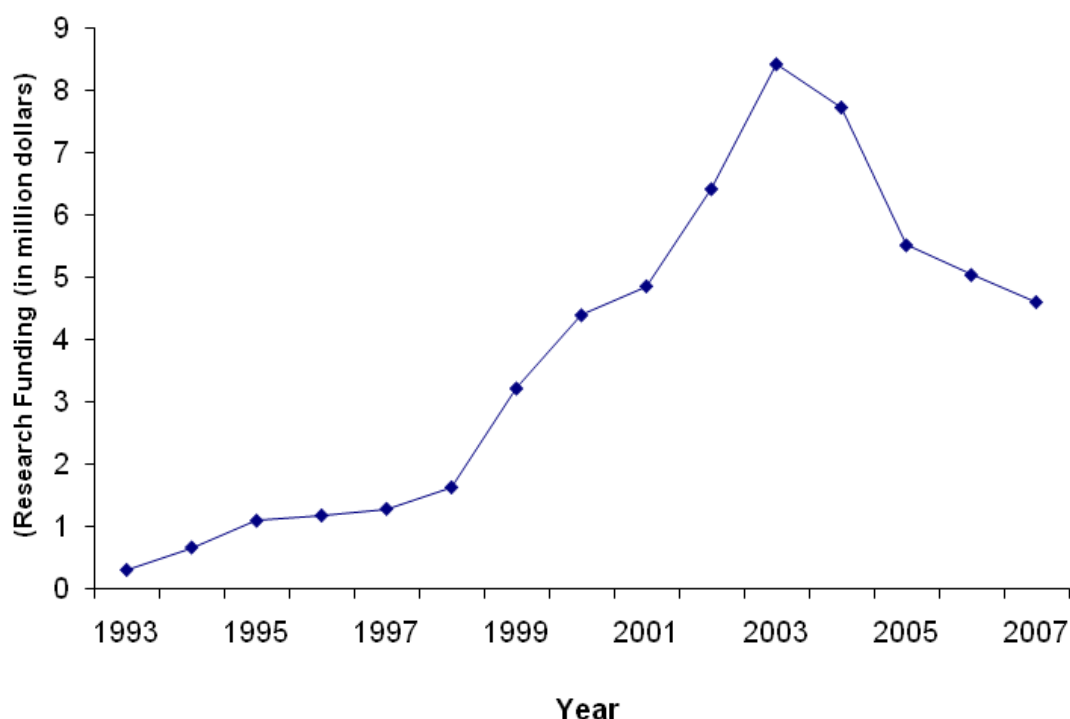


Funding

		2006	2007
UBC Funding	Salaries (faculty & staff)	497,894	503,317
	Operating budget	16,219	0*
External Research		5,034,875	4,599,834

* really!

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