

Chapter 5

Conclusions

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The Quoddy Region in the outer Bay of Fundy is a hot spot of marine species diversity and productivity, a consequence of the high habitat diversity and special oceanographic features. Comparable to the extensive mud flats in the upper Bay of Fundy, the importance of this special ecosystem far exceeds its geographical boundaries. For many species, it is a unique oasis in the northwest Atlantic on which their lives depend. Within the Quoddy Region, the West Isles archipelago, the Grand Manan archipelago, Maces Bay and The Wolves are critical habitats, which are used by many species at once.

Over the past two hundred years, human activities have led to changes in the food web and ecosystem. Most of these changes are not unique to the area but reflect very common negative impacts observed in coastal waters worldwide. Overfishing and the decline or collapse of mammal populations and fish stocks, destruction and overexploitation of habitat building species, nutrient pollution and the decline of long-lived macrophytes, increased blooms of toxic phytoplankton and annual macroalgae, accumulations of toxins in the food chain, and the degradation and destruction of benthic habitat, can be observed in many areas, including the Baltic Sea, North Sea, Mediterranean Sea, Black Sea, Chesapeake Bay, Caribbean, Chile, Australia, Alaska, California, and Florida among others (Schramm & Nienhuis 1996, Vitousek et al. 1997, Fogarty & Murawski 1998, Pauly et al. 1998, Limburg 1999, Tegner & Dayton 1999, Jackson et al. 2001).

In almost all regions, overfishing is the oldest and possibly most significant human impact on coastal and marine ecosystems, the consequences of which we may only now recognize and understand as severe ecosystem changes take place (Jackson et al. 2001). Today, we can hardly imagine the abundances and sizes of fish and mammals that populated historical coastal ecosystems (Jackson et al. 2001). In addition to long-term fishing pressure, multiple other human impacts evolved over the past 100-200 years and may have synergistically stressed already vulnerable species and ecosystems (Jackson et al. 2001).

Moreover, it appears to be a general pattern that the intensity of human activity and thus impacts have consistently expanded outward over time, from rivers to estuaries and coastal waters to further offshore. In early days the signs of concentrated human activities were restricted to the rivers and estuaries such as the St. Croix. In the past forty years, coastal bays such as Passamaquoddy Bay have exhibited similar signs of degradation. As human activities such as fishing and aquaculture operations move further offshore towards remote islands, banks, the ocean shelf, the open ocean and even the deep sea, pollution and over-fishing effects have become visible throughout the Bay of Fundy, the Gulf of Maine, and the Scotian Shelf.

In the following, we will summarize our answers to the research questions we asked in the beginning of this report.

- **What have been the human impacts on the marine ecosystem in the Quoddy Region over the past two centuries?**

=> Humans have altered the food web of species through “top-down” impacts such as excessive fishing, hunting, and harvesting, which is the oldest of all impacts. As they increased their effort, efficiency, and spatial extent over time, the result has been a decline of target species abundance and size, shifts in dominance patterns, shifts in food-web structure. A more recent shift to and expansion of low-trophic level harvesting has the potential to exacerbate these food web changes.

=> Humans have altered species composition and productivity by “bottom-up” impacts such as nutrient enrichment and shifts in nutrient ratios. This has resulted in altered species composition in the phytoplankton community and an increase in less edible or toxic species. With macrophytes, altered nutrient conditions result in a decline of long-lived rockweeds and eel grasses, an increase in the numbers of annual algal blooms, and a partial shift to the dominance of filter feeders.

=> Humans have altered the species environment through “side-in” impacts such as habitat degradation and destruction, chemical contamination and disturbance. The overall area of high quality spawning, breeding, nursing, feeding and staging grounds has declined. Multiple chemical pollutants affect the health, survival and reproduction of species. Increasing human activities in and around coastal waters enhance the level of physiological stress and disturbance.

- **How have human impacts changed the food web: is there an indication of ecological simplification?**

=> There is no evidence of an ecological simplification of the entire food web defined as the loss of an entire trophic level or functional group. But, the food web is severely altered and we find strong shifts in species composition and dominance patterns that affect predator-prey, habitat and competitive relationships. Although some species extinctions occurred, there have also been some species introductions.

- **How have human impacts changed the ecosystem: have we altered the key ecosystem characteristics?**

=> There is clear evidence that the area of undisturbed habitat has been reduced. Moreover, habitat heterogeneity, complexity, quality and health are severely reduced or degraded in certain areas.

- **Have human impacts changed the overall productive potential of the area?**

=> There is no evidence for a decline in the amount of primary productivity as the “food base” in the area. However, species shifts among primary producers towards less edible or toxic algae likely decrease food availability and quality for higher trophic level species and consequently secondary productivity. Certainly, there is a sharply decreased production of traditionally fished species, the magnitude of which may be widely underestimated.

Although human impacts widely affect coastal ecosystems, there are some encouraging conservation and **restoration successes**. As always, it is the recognition of the consequences of human impacts that have launched changes in the behaviour and activities towards our natural environment. In the Quoddy Region, protection efforts have enabled many bird and some mammal species to recover.

Periods of lower fishing pressure during World War II and after the extension of the 200-mile limit enabled fish stocks to increase in abundance during those periods. Restoration of river habitat and effective fishways enabled alewife populations to increase. The use of acoustic “pingers” in gill nets reduces the by-catch of harbour porpoise.

In other marine habitats, effective sewage treatment plants reduced nutrient loads in the Baltic (Savchuk & Wulff 1999). Designation of protection zones resulted in the recovery of benthic habitat and the increase in fish biomass in the Soufriere Marine Management Area in St. Lucia (Roberts & Hawkins 2000). Planting of sea grass accelerated habitat development in the Southern U.S. (Fonseca et al. 1994).

From the available evidence it is clear that if we take the following steps, then the Quoddy Region may support future generations of marine life and humans as it did for the past thousands of years:

- ▶ provide species with adequate food, habitat, and undisturbed space and time;
- ▶ reduce use of destructive and unselective fishing gear,
- ▶ protect critical habitats which are used by many species at once,
- ▶ reduce nutrient pollution and chemical contamination,
- ▶ reduce stress and disturbance on species,
- ▶ integrate human and marine species needs.

References

Note: A guide to the scientific journal abbreviations is found at the end of the reference section.

- Abgrall, P., R.W. Rangeley, L.E. Burrige and P. Lawton. 2000. Sublethal effects of azamethiphos on shelter use by juvenile lobsters (*Homarus americanus*). *Aquaculture*, 181:1-10.
- Ackerfors, H. and M. Enell. 1990. Discharge of nutrients from Swedish fish farming to adjacent sea areas. *Ambio* 19 (1): 28-35.
- Alderman, D.J., H. Rosenthal, P. Smith, J. Stewart and D. Weston. 1994. Chemicals used in mariculture. Prepared by ICES Working Group Environmental Interactions of Mariculture, International Council for the Exploration of the Sea, Copenhagen, Denmark. ICES Coop. Res. Rept. 202: 100 pp.
- Anderson, J.M., F.G. Whoriskey & A. Goode, 2000. Atlantic Salmon on the brink. *Endangered Species Update*, Vol. 17, pp. 15-21.
- Anonymous, 1880. Porpoise shooting. *Scribner's Monthly*, Scribner & Co. Vol. XX, pp. 801-811.
- Anonymous, 1896. Report to the Joint Commission relative to the preservation of the fisheries of waters contiguous to Canada and the United States. Department of Marine and Fisheries.
- Anonymous, 1971. St. Croix River, Summary report to the International Joint Commission. Advisory Board on Pollution Control, St. Croix River.
- Anonymous, 1988. Long-term management plan for the diadromous fisheries of the St. Croix River. *Can. Manuscr. Rep. Fish. Aquat. Sci.*, Vol. 1969, pp. 1-73.
- Anonymous, 1993. Five-year (1993-1997) operational plan for the development and management of the diadromous fishes of the St. Croix River. St. Stephen, Calais, St. Croix Fisheries Steering Committee, St. Croix International Waterway Commission.
- Anonymous, 1999. Review of the status of anadromous salmon (*Salmo salar*) under the US Endangered Species Act. Anadromous Atlantic Salmon Biological Review Team, U.S. Fish and Wildlife Service, NOAA - National Oceanic and Atmospheric Administration.
- Anonymous, 2000. Anadromous alewives and freshwater smallmouth bass on the St. Croix System, Maine and New Brunswick. St. Stephen, Calais, St. Croix Fisheries Steering Committee, St. Croix International Waterway Commission.
- Antworth, J. New Brunswick Department of Environment and Local Government, pers. comm. 2001.
- Armstrong, R., D. MacPhee, T. Katz and R. Endris. 1999. A field evaluation on the efficacy of emamectin benzoate 2.2% aquaculture premix (Slice™, Schering-Plough Animal Health) against sea lice, *Lepeophtheirus salmonis*, infesting Atlantic salmon, *Salmo salar*, in New Brunswick, Canada. Abstract only. *Aquaculture Association of Canada Annual Meeting*, Victoria, BC, October 28, 1999. [Http://www.mi.mun.ca/mi/aac/abst_99/fishhealth.htm](http://www.mi.mun.ca/mi/aac/abst_99/fishhealth.htm).
- Arnold, D.C., 1976. Local denudation of the sublittoral fringe by the green sea urchin: *Strongylocentrotus droebachiensis* (O.F. Muller). *Canadian Field Naturalist*, Vol. 90, pp. 186-187.
- Arthington, A.H. and D.R. Blühdorn. 1996. The effect of species interactions resulting from aquaculture operations, pp. 114-139. In: *Aquaculture and Water Resource Management* (ed. by D.J. Baird, M.C.M. Beveridge, L.A. Kelly and J.F. Muir). Blackwell Science, U.K.
- Bader, M. and P. Holmes. 1999. Sediment sampling for tributyltin and polynuclear aromatic hydrocarbons in the St. Croix Estuary. St. Croix Estuary Project, St. Stephen, New Brunswick. 20 p. + appendices.
- Bailey, H.S. 1988. A new life for the St. Croix River. *Water Poll. Res. J. Canada* (23(4): 568-577.
- Bailey, H.S. 1989. 1987/88 St. Croix River water quality report. Technical Report IWD-AR-WQB-89-148. Environment Canada, Water Quality Branch, Moncton, N.B.
- Bailey, H.S. 1992. 1991 St. Croix River water quality report. Technical Report IWD-AR-MEB-92-178, Environment Canada, Monitoring and Evaluation Branch, Moncton, N.B.
- Bailey, H.S., R. Lane and Y. Godin. 1994. 1993 St. Croix River water quality report. Technical Report ECD-R-ESD-94-190, Environment Canada, Moncton, N.B.

- Bailey, L.W., 1917. Notes on the phytoplankton of the Bay of Fundy and Passamaquoddy Bay. *Contr. Canad. Biol.*, Vol. 1915-1916, pp. 93-107.
- Bailey, W.G. 1957. Some features of the oceanography of the Passamaquoddy region. *Fish. Res. Board Can. MS Rep. Biol. Sta. 2*: 30 p.
- Baines, S.B. & N.S. Fisher. 2001. Interspecific differences in the bioconcentration of selenite by phytoplankton and their ecological implications. *Mar. Ecol. Prog. Ser.* 213: 1-12.
- Barnes, A.C., T.S. Hastings and S.G.B. Amyes. 1994. Amoxicillin resistance in Scottish isolates of *Aeromonas salmonicida*. *J. Fish Dis.* 17:357-363.
- Bates, S.S., 1997. Toxic phytoplankton on the Canadian east coast: Implications for aquaculture. In: *Bul. Aqua. Assoc. Can.*, S.L. Waddy & M. Frechette, eds. St. Andrews, NB, Canada, pp. 9-18.
- Battle, H.I., 1931. Fundy fishery: the mackerel fishery. *Fish. Res. Bd. Canada, Man. Rep. Biol. Stat. No.* 421.
- Baum, E.T. 1998. History and description of the Atlantic salmon aquaculture industry in Maine. Department of Fisheries and Oceans Canadian Stock Assessment Secretariat. *Res. Doc.* 98/152, 20 p.
- Béland, P., S. DeGuise, C. Girard, A. Lagacée, D. Marineau, R. Michaud, D. Muir, R. Norstrom, E. Pelletier, S. Ray and L. Shugart. 1993. Toxic compounds and health and reproductive effects in St. Lawrence beluga whales. *J. Great Lakes Res.* 19(4): 766-775.
- Bennett, P.M., P.D. Jepson, R.J. Law, B.R. Jones, T. Kuiken, J.R. Baker, E. Rogan & J.K. Kirkwood. 2001. Exposure to heavy metals and infectious disease mortality in harbour porpoises from England and Wales. *Environ. Pollut.* 112(1): 33-40.
- Beersma, D.A., J.A. Ellenton, and A. Yagminas. 1986. Investigation of the hepatic mixed-function oxidase system in herring full embryos in relation to environmental contaminants. *Environ. Toxicol. Chem.* 5(3): 309-318.
- Berghem, A. and T. Åsgård. 1996. Waste Production from Aquaculture. In: *Aquaculture and Water Resource Management*, pp. 50-80. (ed. D.J. Baird, M.C.M. Beveridge, L.A. Kelly and J.F. Muir). Blackwell Science, U.K.
- Berry, A.W. 1996. Aquaculture and sea loch nutrient ratios: a hypothesis, pp. 7-15. In: *Aquaculture and Sea Lochs* (ed. K.D. Black). Scottish Association for Marine Sciences, Oban, U.K.
- Beveridge, M.C.M. and M.J. Phillips. 1993. Environmental impact of tropical inland aquaculture, pp 213-236. In: *Environment and Aquaculture in Developing Countries* (eds. R.S.V. Pullin, H. Rosenthal and J.L. Maclean) ICLARM Conference Proceedings, 31. International Centre for Living Aquatic Resource Management. Manila, Philippines.
- Bishop, J.C. & D.W. Black, 1988. The lands edge also: culture, history and seasonality at the Partridge Island shell middens. *Can. J. Archaeol.*, Vol. 12, pp. 17-37.
- Black, D.W., 2000. That thing of shreds and patches: an archaeological narrative of the Bliss Islands Thoroughfare, Quoddy Region, New Brunswick, Canada. In: *The entangled past: integrating history and archaeology*, Proceedings of the 30th Annual Chacmool Archaeological Conference, Calgary, Alberta, The Archaeological Association of the University of Calgary, Alberta, pp. 146-155.
- Black, D.W. & C.J. Turnbull, 1986. Recent archaeological research in the insular Quoddy region, New Brunswick, Canada. *Current Anthropology*, Vol. 27, pp. 400-402.
- Black, D.W., J.E. Reading & H.G. Savage, 1998. Archaeological records of the extinct Sea Mink, *Mustela macrodon* (Carnivora: Mustelidae), from Canada. *Can. Field Naturalist*, Vol. 112, pp. 45-49.
- Black, K.D.. 2001. Sustainability of aquaculture, pp. 199-212. In: *Environmental impacts of Aquaculture* (ed. by K.D. Black), Sheffield Academic Press, Sheffield, U.K.
- Black, K.D., M.C.B. Kierner and I.A. Ezzi. 1996. Benthic impact, hydrogen sulphide and fish health: field and laboratory studies, pp. 16-26. In: *Aquaculture and Sea Lochs* (ed. by K.D. Black). Scottish Association for Marine Sciences, Oban, U.K.
- Boardman, S.L., 1903. *The naturalist of the St. Croix River*. Privately printed, Charles H. Glass and Company, Bangor, Maine.
- Bogdanova, A.Y. and M. Nikinmaa. 1998. Dehydroabietic acid, a major effluent component of paper and pulp industry, decreases erythrocyte pH in lamprey (*Lampetra fluviatilis*). *Aquat. Toxicol.* (43(2-3): 111-120.
- Braune, B.M. & D.E. Gaskin: 1982a. Feeding ecology of nonbreeding populations of larids off Deer Island, New Brunswick. *Auk*, Vol. 99, pp. 67-76.

- Braune, B.M. & D.E. Gaskin: 1982b. Feeding methods and diving rates of migrating larids off Deer Island, New Brunswick. *Can. J. Zool.*, Vol. 60, pp. 2190-2197.
- Braune, B.M. 1987. Mercury accumulation in relation to size and age of Atlantic herring (*Clupea harengus harengus*) from the southwestern Bay of Fundy, Canada. *Arch. Environ. Contam. Toxicol.* 16: 311-320.
- Breen, P.A., 1980. Relations among lobster, sea urchins, and kelp in Nova Scotia. In: Proceedings of the workshop on the relationship between sea urchin grazing and commercial plant/animal harvesting, *Can. Tech. Rep. Fish. Aquat. Sci.*, Vol. 954, pp. 24-32.
- Bricker, S.B., C.G. Clement, D.E. Pirhalla, S.P. Orlando & D.R.G. Farrow, 1999. National estuarine eutrophication assessment: effects of nutrient enrichment in the Nation's estuaries. NOAA, National Ocean Service, Special Projects Office and the National Centers for Coastal Ocean Science, Silver Spring, MD, USA.
- Brown, M.W., S.D. Kraus, D.E. Gaskin & B.N. White, 1994. Sexual composition and analysis of reproductive females in the North Atlantic right whale, *Eubalaena glacialis*, population. *Mar. Mamm. Sci.*, Vol. 10, pp. 253-265.
- Brown, M.W. & S.D. Kraus, 1996. North Atlantic Right Whales. In: Bay of Fundy Issues: a scientific overview, edited by J.A. Percy, P.G. Wells & A.J. Evans, Environment Canada Atlantic Region Occasional Report No. 8, pp. 92-94.
- Brown, R.G.B., 1974. The possible effects of oil spills on marine birds. In: *Summary of physical, biological, socio-economic and other factors relevant to potential oil spills in the Passamaquoddy region of the Bay of Fundy*, edited by Environment Canada, *Fish. Res. Bd. Canada Techn. Rep.* 428, pp. 161-171.
- Brown, R.G.B. & D.E. Gaskin: 1988. The pelagic ecology of the Grey and Red-necked Phalaropes *Phalaropus fulicarius* and *P. lobatus* in the Bay of Fundy, eastern Canada. *Ibis*, Vol. 130, pp. 234-250.
- Brown, R.G.B. & D.E. Gaskin: 1989. Summer zooplankton distribution at the surface of the outer Bay of Fundy, eastern Canada. *Can. J. Zool.*, Vol. 67, pp. 2725-2730.
- Brownlee, B., M.E. Fox, W.M.J. Strachan and S.R. Joshi. 1977. Distribution of dehydroabietic acid in sediments adjacent to a kraft pulp and paper mill. *J. Fish. Res. Board Can.* 34:838-843.
- Bugden, J.B.C., B.T. Hargrave, P.M. Strain & A.R.J. Stewart (eds.). 2001. Spatial patterns of some physical and chemical variables in Passamaquoddy Bay and Letang Inlet, Southwestern Bay of Fundy, September 1999. *Can. Tech. Rep. Fish. Aquat. Sci.* 2356: iv + 96 p.
- Burd, B. 1997. B.C. Salmon Aquaculture Review Interim Draft Report. Key Issue C: Waste Discharges. B.C. Environmental Assessment Office. 157 pp.
- Burger, J. and M. Gochfeld. 1999. Heavy metals in Franklin's gull tissues: age and tissue differences. *Environ. Toxicol. Chem.* 18(4) 673-678.
- Burgess, N.M., D.C. Evers, J.D. Kaplan, M. Duggan & J.J. Kerekes. 1998. Mercury and Reproductive success of common loons in the Maritimes. pp. 102-107. In: N. Burgess, S. Beauchamp, G. Brun, T. Clair, C. Roberts, L. Rutherford, R. Tordon, and O. Vaidya (eds.), *Mercury in Atlantic Canada: A progress report*. Mercury Team, Regional Science Coordinating Committee, Environment Canada - Atlantic Region, 117 p.
- Burgess, N & N. Garrity. 1999. Trends in organochlorine contaminants in seabird eggs from the Bay of Fundy 1972- 1999, p. 35. In: *Understanding change in the Bay of Fundy Ecosystem* (ed. by J. Ollerhead, P.W. Hicklin, P.G. Wells and K. Ramsey) Proceeding of the 3rd Bay of Fundy Science Workshop, Mount Allison University, Sackville, New Brunswick, April 22-24, 1999. Environment Canada, Atlantic Region Occasional Report. 12, Environment Canada, Sackville, New Brunswick, 143 pp..
- Burgess, N.M., K.A. Bredin & G.M. Donaldson. 2000. Contaminants in nestling tree swallows from Atlantic Coastal Action Program (ACAP) sites in Atlantic Canada. Poster, Society of Environmental Toxicology and Chemistry, 21st Annual Meeting. Nashville, TN. Nov. 12-16, 2000.
- Burgess, N.M. & B.M. Braune. 2001. Increasing trends in mercury concentrations in Atlantic and Arctic seabird eggs in Canada. Poster presented at the 11th Annual Meeting of SETAC Europe (Society of Environmental Toxicology and Chemistry), 6-10 May 2001, Madrid, Spain.
- Burridge, L.E. & K. Haya. 1993. The lethality of ivermectin, a potential agent for treatment of salmonids against sea lice, to the shrimp *Crangon septempinosus*. *Aquaculture*, 117:9-14

- Burrige, L.E. & K. Haya. 1995. A review of di-n-butylphthalate in the aquatic environment; concerns regarding its use in salmonid aquaculture. *J. World Aquacult. Soc.* 26(1): 1-13.
- Burrige, L.E., K. Haya, S.L. Waddy, & J. Wade. 2000. The lethality of anti-sea lice formulations Salmosan™ (azamethiphos) and Excis™ (cypermethrin) to stage IV and adult lobsters (*Homarus americanus*) during repeated short-term exposures. *Aquaculture* 182:27-35.
- Butler, M.A.E., 1999. Scallop stock update for SPA 6, Grand Manan and Southwest New Brunswick - 1998. CSAS Res. Doc., Vol. 99/60.
- Caddy, J.F. & R.A. Chandler, 1976. Historical Statistics of Landings of Inshore Species in the Maritime Provinces 1947-1973. *Fish. Mar. Serv. Tech. Rep. No. 639.*
- Campbell, A., 1979. Invertebrates and marine plants commercial landings in the Passamaquoddy region and the Bay of Fundy, 1973-1978. In: *Evaluation of recent data relative to potential oil spills in the Passamaquoddy area*, edited by D.J. Scarratt, *Fish. Mar. Serv. Techn. Rep. No 901*, pp. 19-26.
- Canada, Commission of Conservation, 1912. *Sea-Fisheries of Eastern Canada*. The Mortimer Co., Ottawa.
- Capone, D.G., D.P. Weston, V. Miller & C. Shoemaker. 1996. Antibacterial residues in marine sediments and invertebrates following chemotherapy in aquaculture. *Aquaculture*, 145(1-4): 55-75.
- Cappon, C.J. and J.C. Smith. 1981. Mercury and selenium content and chemical form in fish muscle. *Arch. Environm. Contam. Toxicol.* 10: 305-319.
- Caravan, T., 1997. Climate in the Atlantic Region. In: *Climate change and climate variability in Atlantic Canada*, edited by R.W. Shaw, Environment Canada Atlantic Region Occasional Report No. 9, pp. 11-15.
- Carpenter, S.R., N.F. Caracao, D.L. Correll, R.W. Howarth, A.N. Sharpley & V.H. Smith, 1998. Nonpoint pollution of surface waters with phosphorus and nitrogen. *Ecol. Appl.*, Vol. 8, pp. 559-568.
- Carr, J. & F. Whoriskey, 1999. Magaguadavic River Research Program: annual report for 1999. St. Andrews, New Brunswick, Atlantic Salmon Federation.
- Carr, J.W., J.M. Anderson, F.G. Whoriskey & T. Dilworth, 1997. The occurrence and spawning of cultured Atlantic salmon (*Salmo salar*) in a Canadian river. *ICES J. Mar. Sci.*, Vol. 54, pp. 1064-1073.
- Caswell, H., S. Brault, A.J. Read, & T.D. Smith, 1998. Harbor porpoise and fisheries: An uncertainty analysis of incidental mortality. *Ecol. Appl.*, Vol. 8, pp. 1226-1238.
- CCME. (Canadian Council of Ministers of the Environment). 1999. Canadian Water Quality Guidelines for the Protection of Aquatic Life.
- CCNB (Conservation Council of New Brunswick) & Union of New Brunswick Indians. 1999. Mercury contamination of the St. John River food chain. Fredericton, New Brunswick. 4 p.
- Chang, B.D. & J.P. Thonney. 1992. Overview and environmental status of the New Brunswick salmon culture industry. *Bull. Aquacul. Assoc. Canada* 92(3): 61-63.
- Chang, B.D. & W. M. Watson-Wright, 1997. Aquaculture research at the St. Andrews Biological Station: past, present and future. Huntsman Marine Science Centre Symposium: Coldwater aquaculture to the year 2000, September 1995, St. Andrews, New Brunswick, Aquaculture Association of Canada, Special Publication No. 2.
- Chang, S., V.S. Zdanowicz and R.A. Murchelano. 1996. Association between liver lesions in winter flounder (*Pleuronectes americanus*) and sediment chemical contaminants from northeast United States estuaries. *ICES CM* 1996/E:12.
- Chapin III, F.S., B.H. Walker, R.J. Hobbs, D.U. Hooper, J.H. Lawton, O.E. Sala & D. Tilman, 1997. Biotic control over the functioning of ecosystems. *Science*, Vol. 277, pp. 500-504.
- Chapman, D.V. 1985. Preliminary observations on the interaction between plankton and sewage dumped at sea. *ICES, CM* 1985/E:26, 11p.
- Chapman, D.V., S.L. White, P.S. Rainbow, and M. Taylor. 1988. Interactions between marine crustaceans and digested sewage sludge. *Mar. Poll. Bull.* 19: 115-119.
- Chaput, G. & E. Prevost, 1998. Annual and decadal change in Atlantic salmon (*Salmo salar*) abundance in eastern Canada. CSAS Res. Doc., Vol. 99/30.

- Chase, M., P. Hennigar, J. Sowles, S. Jones, R. Crawford, G. Harding, J. Pederson, C. Krahforst, D. Taylor, K. Coombs. 1998. Evaluation of Gulfwatch 1997 - Seventh year of the Gulf of Maine Environmental Monitoring Plan. The Gulf of Maine Council on the Marine Environment, State Planning Office, Augusta, ME. 68 p. + appendices.
- Chenoweth, S., 1994. The blue mussel in Maine. West Boothbay Harbour, Maine, Maine Department of Marine Resources.
- Choi, M.H. & J.J. Cech Jr. 1998. Unexpectedly high mercury level in pelleted commercial fish feed. Environ. Toxicol. Chem. 17(10): 1979-1981.
- Christie, D.S., 1979. Changes in maritime bird populations, 1878-1978. J. New Brunswick Museum 1979, pp. 132-146.
- Christie, D.S., 1983. Birds. In: Marine and coastal systems of the Quoddy region, New Brunswick, edited by M.L.H. Thomas, Can. Spec. Publ. Fish. Aquat. Sci., No. 64, pp. 215-229.
- Clair, T., S. Beltaos, W. Brimley & A. Diamond, 1997. Climate change sensitivity of Atlantic Canada's hydrological and ecological systems. In: Climate change and climate variability in Atlantic Canada, edited by R.W. Shaw, Environment Canada Atlantic Region Occasional Report No. 9, pp. 59-77.
- Clark, S.H., S.X. Cadrin, D.F. Schick, P.J. Diodati, M.P. Armstrong & D. McCarron, 2000. The Gulf of Maine shrimp (*Pandalus borealis*) fishery: a review of the record. J. Northw. Atl. Fish. Sci., Vol. 27, pp. 193-226.
- Clarke, K.R. & R.M. Warwick. 1994. Change in marine communities: An approach to statistical analysis and interpretation. National Research Council, UK, 144 p.
- Colborn, T., D. Dumanoski and J. Peterson Myers. 1996. Our Stolen Future: Are we threatening our fertility, intelligence, and survival? A scientific detective story. Dutton. New York. 306 pp.
- Colbourne, P.L. & J.M. Terhune, 1991. Harbour seals (*Phoca vitulina*) do not follow herring movements in the Bay of Fundy, Canada. Ophelia, Vol. 33, pp. 105-112.
- Coles, J., S.R. Farley & R.K. Pike. 1995. Alteration of the immune response of the common marine mussel *Mytilus edulis* resulting from exposure to cadmium. Diseases of Aquatic Organisms 22: 59-65.
- Commission of Conservation Canada, 1912. Sea-Fisheries of Eastern Canada. The Mortimer Co., Ottawa.
- Conservation Council of New Brunswick. 1997. Pesticides in salmon aquaculture in southwest New Brunswick. Prepared for the World Wildlife Fund, Toronto. Unpublished. 41 p.
- Coon, D. 1999. An ecological sketch of some Fundy fisheries. Conservation Council of New Brunswick. Fredericton, New Brunswick. 32 p.
- Corey, S., 1983. Larger zooplankton of the Quoddy Region. In: Marine and coastal systems of the Quoddy region, New Brunswick, edited by M.L.H. Thomas, Can. Spec. Publ. Fish. Aquat. Sci. No. 64, pp. 193-200.
- Corey, S., 1988. Quantitative distributional patterns and aspects of the biology of the Mysidacea (Crustacea: Peracarida) in the zooplankton of the Bay of Fundy region. Can. J. Zool., Vol. 66, pp. 1545-1552.
- Corey, S., 1990. Distributional patterns of amphipoda in the Bay of Fundy region, Canada. Crustaceana, Vol. 58, pp. 291-308.
- COSEWIC (Committee on the Status of Endangered Wildlife in Canada), 2000. Canadian species at risk, November 2000. Committee on the Status of Endangered Wildlife in Canada, 24 pp.
- Costa-Pierce, B.A. 1996. Environmental Impacts of nutrients from aquaculture: Towards the evolution of sustainable aquaculture, pp. 81-113. In: Aquaculture and Water Resource Management (ed. by D.J. Baird, M.C.M. Beveridge, L.A. Kelly and J.F. Muir). Blackwell Science, U.K.
- Costello, M.J. & J.C. Gamble. 1992. Effects of sewage sludge on marine fish embryos and larvae. Marine Environ. Res. 33: 49-74.
- Cote, R.P. 1973. A study of the toxicity of the Georgia-Pacific pulp and paper mill effluent, in Woodland, Maine. Surveillance and Analysis Division, Environmental Protection Service. EPS 5-WP-73-4. 35 pp.
- Cowie, J.J., 1912. Sea-fisheries of Eastern Canada. In: Sea-fisheries of Eastern Canada, The Mortimer Co., Ottawa. pp. 94-119.
- Coyne, R. M. Hiney & P. Smith. 1997. Transient presence of oxytetracycline in blue mussels (*Mytilus edulis*) following its therapeutic use at a marine Atlantic salmon farm. Aquaculture 149(3-4):175-181.

- Croce, B. & R.M. Stagg. Exposure of Atlantic salmon parr (*Salmo salar*) to a combination of resin acids and a water soluble fraction of diesel fuel oil: A model to investigate the chemical causes of pigmented salmon syndrom. *Environ. Toxicol. Chem.* 16(9): 1921-1929.
- CWS (Canadian Wildlife Service), 1979. Summary of unpublished surveys of waterfowl and seabirds in Passamaquoddy region 1973-79. In: Evaluation of recent data relative to potential oil spills in the Passamaquoddy area, edited by D.J. Scarratt, *Fish. Mar. Serv. Techn. Rep. No.* 901, pp. 61-67.
- Daborn, G.R., 1984. Zooplankton studies in the upper Bay of Fundy since 1976. In: Update of the marine environmental consequences of tidal power development in the upper reaches of the Bay of Fundy, edited by D.C. Gordon, Jr. & M.J. Dadswell, *Can. Tech. Rep. Fish. Aquat. Sci. No.* 1256, pp. 135-162.
- Dadswell, M.J., R. Bradford, A.H. Leim & D.J. Scarratt, 1984. A review of research on fishes and fisheries in the Bay of Fundy between 1976 and 1983 with particular reference to its upper reaches. In: Update of the marine environmental consequences of tidal power development in the upper reaches of the Bay of Fundy, edited by D.C. Gordon, Jr. & M.J. Dadswell, *Can. Tech. Rep. Fish. Aquat. Sci. No.* 1256.
- Daily, G.C., 1997. *Nature's services. Societal dependence on natural ecosystems.* Island Press, Washington.
- Dale, N.G. and A.L. Dawson. 1974. Characteristics of fish plant wastes in Nova Scotia and their effects on coastal bays. V: Nearshore effects. Environmental Impact and Assessment Report EPS-8-AR-75-6. Environmental Protection Service (Atlantic Region). 174 p.
- Dalziel, J.A., P.A. Yeats, and B.P. Amirault. 1998. Inorganic chemical analysis of major rivers flowing into the Bay of Fundy, Scotian Shelf and Bras d'Or Lakes. *Can. Tech. Rep. Fish. Aquat. Sci.* 2226: vii + 140 p.
- Darwin, C., 1839. *Voyage of the Beagle.* P.F. Collier and Son, New York
- Davidson, V.M., 1934. Fluctuations in the abundance of planktonic diatoms in the Passamaquoddy region, New Brunswick, from 1924 to 1931. *Contrib. Can. Biol. Fish., Vol.* 8, pp. 357-407.
- Davis, H.A. 1974. An International Community on the St. Croix (1604-1930). *Maine Studies no.* 64. University of Maine, Orono.
- DFO (Fisheries and Oceans Canada), 1996. Monitoring of sea lice treatment chemicals in southwestern New Brunswick. DFO Science High Priority Project Final Report, 1995/96.
- DFO (Fisheries and Oceans Canada), 1997. Area 6 Southwest New Brunswick Scallop. DFO Science Stock Status Report C3-25, pp. 1-3.
- DFO (Fisheries and Oceans Canada) 1998a. Bay of Fundy Lobster (LFAs 35, 36 and 38). DFO Science Stock Status Report C3-61.
- DFO (Fisheries and Oceans Canada) 1998b. Periwinkle (*Littorina littorea*). DFO Science Stock Status Report, Vol. C3-46, pp. 1-5.
- DFO (Fisheries and Oceans Canada) 1999a.. The impact of the rockweed harvest on the habitat of southwest New Brunswick. DFO Maritimes Regional Habitat Status Report 99/2E, pp. 1-9.
- DFO (Fisheries and Oceans Canada). 1999b. Interaction between wild and farmed Atlantic Salmon in the Maritime provinces. DFO Maritime Regional Habitat Status Report 99/1E. 27 p.
- DFO (Fisheries and Oceans Canada) 2000. Southwestern New Brunswick (LFA 36-38) green sea urchin. DFO Science Stock Status Report, Vol. C3-49, pp. 1-8.
- Dodd, Q. 2000. Antibiotic use in B.C., p. 23. In: *Northern Aquaculture: Environment 2000* (ed. by P. Chettleburgh). Victoria, British Columbia.
- Dow, R.L. & F.T. Baird, Jr., 1960. Scallop resource of the United States Passamaquoddy Area. *U.S. Fish Wildl. Serv. Spec. Scient. Rep. Fish., Vol.* 367, pp. 1-9.
- Drinkwater, K., 1997. Impacts of climate variability on Atlantic Canada fish and shellfish stocks. In: *Climate change and climate variability in Atlantic Canada*, edited by R.W. Shaw, Environment Canada Atlantic Region Occasional Report No. 9, pp. 21-34.
- Duarte, C.M., 1995. Submerged aquatic vegetation in relation to different nutrient regimes. *Ophelia*, Vol. 41, pp. 87-112.

- Duncan, C.D., 1996. Phalaropes in the Bay of Fundy. In: Bay of Fundy Issues: a scientific overview, edited by J.A. Percy, P.G. Wells & A.J. Evans, Environment Canada Atlantic Region, Occasional Report No. 8, pp. 87-88.
- Duplisea, D.E. & B.T. Hargrave. 1996. Response of meiobenthic size-structure, biomass and respiration to sediment organic enrichment. *Hydrobiologia* 339 (1-3): 161-170.
- Eaton, P. & V. Zitko. 1978. Polycyclic aromatic hydrocarbons in marine sediments and shellfish near creosoted wharf structures in eastern Canada. *ICES C.M.* 1978/E:25.
- Eaton, P.B., A.G. Gray, P.W. Johnson & E. Hundert (1994). State of the Environment in the Atlantic Region. Minister of Supply and Services (Ottawa). 457 p.
- Eastern Charlotte Waterways. 2001. Pers. comm.
- Elliot, J.E., A.M. Scheuhammer, F.A. Leighton and P.A. Pearce. 1992. Heavy metal and metallothionein concentrations in Atlantic Canadian seabirds. *Arch. Environ. Contam. Toxicol.*, 22: 63-73.
- Ellis, D. W. and Associates, 1996. Net loss: The salmon netcage industry in British Columbia. The David Suzuki Foundation, Vancouver, BC, Canada.
- Environment Canada. 1973. Pollution and the fisheries: Papers presented at the 27th annual meeting Fisheries Council of Canada. Economic and technical Review Report EPS 3-WP-73-4. Water Pollution Control Directorate.
- Environment Canada. 1991. The State of Canada's Environment - 1991. Ministry of Supply and Services (Ottawa), En21-54/1991E.
- Environment Canada. 1996. Conserving Canada's Natural Legacy: The State of Canada's Environment 1996. Ottawa.
- Environment Canada. 2001. Interim Canadian Sediment Quality Guidelines -<http://www.ec.gc.ca/ceqg-rdq/sediment.htm> and Canadian Tissue Residue Guidelines - <http://www.ec.gc.ca/ceqg-rdq/tissue.htm>.
- Environment Department of the Passamaquoddy Tribe at Pleasant Point, Maine. 2001. Identifying Pollutants in species regularly consumed by Native Americans in the Passamaquoddy Bay region. Final Report March 9, 2001, Results of the Toxics Monitoring Program. Perry, Maine. 26 p.
- Ernst, W., P. Jackman, K. Doe, F. Page, G. Julien, K. MacKay, and T. Sutherland. 2001. Dispersion and toxicity to non-target aquatic organisms of pesticides used to treat seal lice on salmon in net pen enclosures. *Mar. Poll. Bull.* 42(6): 433-444.
- Erskine, A.J., ed. 1997. Canada Goose studies in the Maritime Provinces 1950-1992. Sackville, New Brunswick, Environment Canada - Atlantic Region Occasional Report No. 7.
- Erskine, A.J., 1997a. Wild-breeding Canada Geese in the Maritime Provinces. In: *Canada Goose studies in the Maritime Provinces 1950-1992*, edited by A.J. Erskine, Environment Canada - Atlantic Region Occasional Report No. 7., pp. 124-127.
- Erskine, A.J., 1997b. Feeding and habitat use by Canada Geese in the Maritime Provinces. In: *Canada Goose studies in the Maritime Provinces 1950-1992*, edited by A.J. Erskine, Environment Canada - Atlantic Region Occasional Report No. 7., pp. 128-130.
- Erskine, A.J., 1997c. Hunter kill of Canada Geese in the Atlantic Provinces. In: *Canada Goose studies in the Maritime Provinces 1950-1992*, edited by A.J. Erskine, Environment Canada - Atlantic Region Occasional Report No. 7., pp. 155-163
- Ervik, A., P.K. Hansen, J. Aure, A. Stigebrandt, P. Johannessen & T. Jahnsen. 1997. Regulating the local environmental impact of intensive marine fish farming. I. The concept of the MOM system (Modelling - Ongoing fish farms - Monitoring). *Aquaculture* 158:85-94.
- Fåhræus-Van Ree, G.E. & J.F. Payne. 1999. Enzyme cytochemical responses of mussels (*Mytilus edulis*) to resin acid constituents of pulp mill effluent. *Bull. Environ. Contam. Toxicol.* (63): 430-437.
- Fairchild, L.F, E.O. Swansburg, J.T. Arsenault & S.B. Brown. 1999. Does an association between pesticide use and subsequent declines in catch of Atlantic Salmon (*Salmo salar*) represent a case of endocrine disruption? *Environmental Health Perspectives* 107(5): 349-358.
- Falconer, C.R., I.M. Davis & G. Topping. 1983. Trace metals in the common porpoise *Phocoena phocoena*. *Mar. Environ. Res.* 8: 119.

- Farrar R. & M. White. 1969. A pollution survey of the St. Croix River. Georgia-Pacific Corporation. Woodland, Maine.
- Findlay, R.H., L. Watling & L.M. Mayer. 1995. Environmental impact of salmon net-pen culture on marine benthic communities in Maine: A case study. *Estuaries*, 18 (1A): 145-179.
- Fish, C.J. & M.W. Johnson, 1937. The biology of the zooplankton population in the Bay of Fundy and Gulf of Maine with special reference to production and distribution. *J. Biol. Bd. Can.*, Vol. 3, pp. 189-322.
- Fisher, B.E. 1999. Most unwanted: persistent organic pollutants. *Environmental Health Perspectives* 107(1): A18-A23.
- Fleming, I.A., K. Hindar, I.B. Mjølnerød, B. Jonsson, T. Balstad & A. Lamberg. 2000. Lifetime success and interactions of farm salmon invading a native population. *Proc. R. Soc. Lond.* 267:1517-1523.
- Fleming, S., R.W. Furness and I.M. Davies. 2000. Contemporary patterns and historical rates of increase of mercury contamination in different marine food chains. ICES CM 2000/S:02.
- Fletcher, J.S. & A.L. Meister, 1982. The St. Croix River. Bangor, Maine, Atlantic Sea Run Salmon Commission.
- Fogarty, M.J. & S.A. Murawski, 1998. Large-scale disturbance and the structure of marine systems: fishery impacts on Georges Bank. *Ecol. Applic.*, Vol. 8, pp. 6-22.
- Fonseca, M.S., W.J. Kenworthy, F.X. Courtney & M.O. Hall, 1994. Seagrass planting in the South-eastern United States: methods for accelerating habitat development. *Restorat. Ecol.*, Vol. 2, pp. 198-212.
- Forbes, D.L., J. Shaw & R.B. Taylor, 1997. Climate change impacts in the coastal zone of Atlantic Canada. In: *Climate change and climate variability in Atlantic Canada*, edited by R.W. Shaw, Environment Canada Atlantic Region Occasional Report No. 9, pp. 37-55.
- Fossbakk, T. 2000. Antibiotic use plummets in Norway: trend typical around the world, p.22. In: *Northern Aquaculture: Environment 2000* (ed. by P. Chettleburgh). Victoria, British Columbia.
- Found, W.A., 1912. The lobster fishery of Canada. In: *Sea-fisheries of Eastern Canada*, The Mortimer Co., Ottawa. pp. 50-77.
- Fox, M.E., D.M. Whittle and K.L.E. Kaiser. 1977. Dehydroabietic acid accumulation by rainbow trout (*Salmo gairdneri*) exposed to kraft mill effluent. *J. Great Lakes Res.* 3: 155-158.
- Franklin, F.L. 1983. Laboratory tests as a basis for the control of sewage sludge dumping at sea. *Mar. Poll. Bull.* 14: 217-223.
- Fritz, C.W., 1921. Plankton diatoms, their distribution and bathymetric range in St. Andrews waters. *Contr. Can. Biol.*, Vol. 1918-1920, pp. 49-62.
- Gannon, D.P., J.E. Craddock, A.J. Read, 1998. Autumn food habits of harbour porpoises, *Phocoena phocoena*, in the Gulf of Maine. *Fish. Bull.*, Vol. 96, pp. 428-437.
- Gao, A. & D.E. Gaskin, 1996. Geographical variation in metric skull characters among proposed subpopulations and stocks of harbour porpoise, *Phocoena phocoena*, in the western North Atlantic. *Mar. Mamm. Sci.*, Vol. 12, pp. 516-527.
- Garcia-Hernandez, J., E.P. Glenn, J. Artiola & D. Baumgartner. Bioaccumulation of selenium (Se) in the Cienega de Santa Clara Wetland, Sonora, Mexico. *Ecotoxicol. Environ. Saf.* 46(3) 298-304.
- Gaskin, D.E., K. Ishida & R. Frank. 1972. Mercury in harbour porpoises (*Phocoena phocoena*) from the Bay of Fundy Region. *J. Fish. Res. Board Can.* 29(11): 1644-1646.
- Gaskin, D.E., G.J.D. Smith & A.P. Watson, 1975. Preliminary study of movements of harbour porpoises (*Phocoena phocoena*) in the Bay of Fundy, using radio telemetric methods. *Can. J. Zool.*, Vol. 53, pp. 1466-1471.
- Gaskin, D.E. & G.J.D. Smith, 1979. Observations on marine mammals, birds and environmental conditions in the Head Harbour region of the Bay of Fundy. In: *Evaluation of recent data relative to potential oil spills in the Passamaquoddy area*, edited by D.J. Scarratt, Fish. Mar. Serv. Techn. Rep. No 901, pp. 69-86.
- Gaskin, D.E., K.I. Stonefield & P. Suda. 1979. Changes in mercury levels in harbor porpoises from the Bay of Fundy, Canada, and adjacent waters during 1969-1977. *Arch. Environ. Contam. Toxicol.* 8(6): 733-762.
- Gaskin, D.E., 1983. The Marine Mammal Community. In: *Marine and coastal systems of the Quoddy region, New Brunswick*, edited by M.L.H. Thomas, *Can. Spec. Publ. Fish. Aquat. Sci.* No. 64, pp. 245-268.

- Gaskin, D.E., 1991. An update on the status of the right whale, *Eubalaena glacialis*, in Canada. *Can. Field. Nat.*, Vol. 105, pp. 198-205.
- Gaskin, D.E., 1992. Status of the harbour porpoise, *Phocoena phocoena*, in Canada. *Can. Field. Nat.*, Vol. 106, pp. 36-54.
- Gatschet, A.S., 1897. All around the Bay of Passamaquoddy - with the interpretation of its Indian names of localities. *National Geographic Magazine*, Vol. VIII.
- Gendron, L. & P. Fradette, 1994. A review of the interactions between rock crab *Cancer irroratus* and lobster *Homarus americanus* and examination of the possible impacts of rock crab fishing on lobster resource. In: *The development of underutilized invertebrate fisheries in eastern Canada*, edited by L. Gendron & S.M.C. Robinson, *Can. Manuscr. Rep. Fish. Aquat. Sci.*, Vol. 2247, pp. 45-51.
- Gendron, L. & S.M.C. Robinson, 1994. The development of underutilized invertebrate fisheries in Eastern Canada. *Can. Manuscr. Rep. Fish. Aquat. Sci.*, Vol. 2247, pp. 129.
- GESAMP (IMO, FAO, UNESCO-IOC, WMO, WHO, IAEA, UN, UNEP Joint Group of Experts on the Scientific Aspects of Marine Pollution). 1990. The state of the marine environment. *Rep. Stud. GESAMP* (39): 111 p.
- GESAMP (IMO, FAO, UNESCO-IOC, WMO, WHO, IAEA, UN, UNEP Joint Group of Experts on the Scientific Aspects of Marine Pollution). 1997. Towards safe and effective use of chemicals in coastal aquaculture. *Rep. Stud. GESAMP* (65): 40 p.
- Gesner, A., 1847. *New Brunswick; with notes for emigrants*. Simonds and Ward, London.
- Gordon, D.C., Jr. & M.J. Dadswell, 1984. Update on the marine environmental consequences of tidal power development in the upper reaches of the Bay of Fundy. *Can. Tech. Rep. Fish. Aquat. Sci.* No. 1256.
- Gotceitas, V., S. Fraser & J.A. Brown, 1997. Use of eelgrass beds (*Zostera marina*) by juvenile Atlantic cod (*Gadus morhua*). *Can. J. Fish. Aquat. Sci.*, Vol. 54, pp. 1306-1319.
- Goudie, R.I., 1989. Historical status of Harlequin Ducks wintering in eastern North America - a reappraisal. *Wilson Bull.*, Vol. 101, pp. 112-114.
- Graham, M., 1936. Investigations of the herring of Passamaquoddy and adjacent regions. *J. Biol. Bd. Canada*, Vol. 2, pp. 95-140.
- Gran, H.H. & T. Braarud, 1935. A quantitative study of the phytoplankton in the Bay of Fundy and the Gulf of Maine (including observations on hydrography, chemistry and turbidity). *J. Biol. Bd. Canada*, Vol. 1, pp. 279-467.
- Greenberg, D.A., B.D. Petrie, G.R. Daborn & G.B. Fader, 1996. The physical environment of the Bay of Fundy. In: *Bay of Fundy Issues: a scientific overview*, edited by J.A. Percy, P.G. Wells & A.J. Evans, Environment Canada Atlantic Region Occasional Report 8, Wolfville, Nova Scotia. pp. 11-36.
- Gross, M.R. 1998. One species with two biologies: Atlantic salmon (*Salmo salar*) in the wild and in Aquaculture. *Can. J. Fish. Aquat. Sci.* 55(Suppl. 1):131-144.
- Hallegraeff, G.M., 1993. A review of harmful algal blooms and their apparent global increase. *Phycologia*, Vol. 32, pp. 79-99.
- Hamilton, D.J., 2000a. Direct and indirect effects of predation by Common Eiders and abiotic disturbance in an intertidal community. *Ecol. Monogr.*, Vol. 70, pp. 21-43.
- Hamilton, D.J., 2000b. Community-level interactions between birds and aquatic macrophytes: lessons for a rockweed harvest? *Gulf of Maine Rockweed: Management in the face of scientific uncertainty*. Proceedings of the GPAC workshop., St. Andrews, New Brunswick, Huntsman Marine Science Centre Occasional Report 00/1.
- Hansen, P.D., H. von Westernhagen, & H. Rosenthal. 1985. Chlorinated hydrocarbons and hatching success in Baltic herring spring spawners. *Marine Environ. Research* 15:59-76.
- Hardie, D., 1979. West Isles natural area of Canadian significance. In: *Evaluation of recent data relative to potential oil spills in the Passamaquoddy area*, edited by D.J. Scarratt, *Fish. Mar. Serv. Techn. Rep.* No. 901, pp. 101-107.
- Hargrave, B.T., G.A. Phillips, L.I. Doucette, M.J. White, T.G. Milligan, D.J. Wildish, & R.E. Cranston. 1995. Biogeochemical observations to assess benthic impacts of organic enrichment from marine aquaculture in the Western Isles region of the Bay of Fundy, 1994. *Can. Tech. Rep. Fish. Aquat. Sci.* 2062: v + 159 p.

- Harvey, J., 1994. Turning the tide: a citizen's action guide to the Bay of Fundy. Conservation Council of New Brunswick, Fredericton, New Brunswick.
- Harvey, J., D. Coon & J. Abouchar, 1998. Habitat lost: taking the pulse of estuaries in the Canadian Gulf of Maine. Conservation Council of New Brunswick, Fredericton, New Brunswick.
- Havey, K.A., 1963. St. Croix River Fish Management and Restoration. Maine Department of Inland Fisheries and Game, Machias, Maine.
- Hawkins, L., H. Hariharan, K. Whitman, G. Johnson & J. Bryenton. 1997. Drug resistance of atypical *Aeromonas salmonicida* from Atlantic salmon and rainbow trout in Newfoundland. Bull. Aquacult. Assoc. Can. 2:39-41
- Haya, K., J.L. Martin, L.E. Burrige, B.A. Waiwood & D.J. Wildish, 1991. Domoic acid in shellfish and plankton from the Bay of Fundy, New Brunswick, Canada. J. Shellfish Res., Vol. 10, pp. 113-118.
- HEED (Health Ecological and Economic Dimensions), 1998. Marine ecosystems: emerging diseases as indicators of change. Health Ecological and Economic Dimensions of Global Change Program. Center for Health and the Global Environment, Harvard Medical School. Boston, MA, USA.
- Hektoen, H, J.A. Berge, V. Hormazabal & M. Yndestad. 1994. Persistence of antibacterial agents in marine sediments. Aquaculture 133: 175-184.
- Hicklin, P.W. & P.C. Smith, 1984. Studies on birds in the Bay of Fundy: a review. In: Update of the marine environmental consequences of tidal power development in the upper reaches of the Bay of Fundy, edited by D.C. Gordon, Jr. & M.J. Dadswell, Can. Tech. Rep. Fish. Aquat. Sci. No. 1256.
- Hicklin, P.W., 1987. The migration of shorebirds in the Bay of Fundy. Wilson Bull., Vol. 99, pp. 540-570.
- Hicklin, P.W., 1996. Birds. In: Bay of Fundy Issues: a scientific overview, edited by J.A. Percy, P.G. Wells & A.J. Evans, Environment Canada Atlantic Region Occasional Report No. 8, pp. 76-89.
- Hindar, K. 2001. Interactions of cultured and wild Atlantic salmon species. pp. 64-94. In Proceedings of the workshop on marine aquaculture and the environment: A meeting for stakeholders in the Northeast. Univ. of Massachusetts, Boston January 11-13, 2001.
- Hinga, K.R., A.A. Keller & C.A. Oviatt. 1991. Atmospheric deposition and nitrogen inputs to coastal waters. Ambio 20:256-260.
- Hogans, W.E. 1995a. Environmental impacts of pyrethrin, an insecticide used in the treatment of sea lice (Copepoda: Caligidae) on Atlantic salmon (*Salmo salar*) cultured in marine waters of the lower Bay of Fundy: Results of field trials. AFAP Scientific Contract 94-S-036.
- Hogans, W.E. 1995b. Field and laboratory trials to determine the environmental impacts of hydrogen peroxide, a compound used in the treatment of sea lice (Copepoda: Caligidae) on cultured Atlantic salmon (*Salmo salar*) cultured in marine waters of the lower Bay of Fundy. Report to the Department of Fisheries and Oceans, St. Andrews, NB.
- Hogans, W.E. 1996. Field trials to determine the non-target organism mortality caused by commercial-scale applications of salmosan (azamethiphos) a pesticide used in the treatment of sea lice (Copepoda: Caligidae) on cultured Atlantic salmon (*Salmo salar*). Report to the Department of Fisheries and Oceans, St. Andrews, NB.
- Holten Lutzhøft, H.-C., B. Halling-Sørensen & S.E. Jørgensen. 1999. Algal toxicity of antibacterial agents applied in Danish fish farming. Arch. Environ. Contam. Toxicol. 36: 1-6.
- Howell G. & D. Lockerbie. 1983a. St. Croix River water quality during the years 1965 to 1981. Technical Report IWD-AR-WQB-83-50, Environment Canada, Water Quality Branch, Moncton, N.B.
- Howell G. & D. Lockerbie. 1983b. 1982/83 St. Croix River water quality report. Technical Report IWD-AR-WQB-83-49, Environment Canada, Water Quality Branch, Moncton, N.B.
- Howell, G. 1984. The relationship of the water quality of the St. Croix River to pulp mill effluent discharge. Technical Report IWD-AR-WQB-84-59. Environment Canada, Water Quality Branch, Moncton, N.B.
- Huettmann, F. & A.W. Diamond, 2000. Seabird migration in the Canadian northwest Atlantic Ocean: moulting locations and movement patterns of immature birds. Can. J. Zool., Vol. 78, pp. 624-647.
- Huettmann, F., K. MacIntosh, C. Stevens, T. Dean & A.W. Diamond, 2000. A large mid-winter observation of Bonaparte's Gulls, *Larus philadelphia*, in Head Harbour Passage, New Brunswick. Can. Field Nat., Vol. 114, pp. 327-330.
- Hunter (and Associates), 1982. Coastal zone management study, Bay of Fundy, New Brunswick. Hunter and Associates, New Brunswick.

- Huntsman, A.G., 1922. The Fishes of the Bay of Fundy. Contr. Can. Biology, Vol. 1921, pp. 49-72.
- Huntsman, A.G. & A.W.H. Needler, 1927. Fluctuations in the haddock fishery of the Bay of Fundy. Contr. Canad. Biol. Fish., Vol. 3, pp. 425-436.
- Huntsman, A.G., 1931. Temperature and the Passamaquoddy fishery. Biol. Bd. Canada, Progr. Rep., Vol. 1, pp. 14-15.
- Huntsman, A.G., 1933. Heat and cold make herring seasons in Passamaquoddy. Biol. Bd. Canada Progr. Rep., Vol. 7, pp. 3-6.
- Huntsman, A.G., 1938. International Passamaquoddy fishery investigations. Journal Councel, Vol. 13, pp.357-369.
- Huntsman, A.G., 1953a. Movements and decline of large Quoddy herring. J. Fish. Res. Bd. Canada, Vol. 10, pp. 1-50.
- Huntsman, A.G., 1953b. How Passamaquoddy produces sardines. Studies from the stations of the Fisheries Research Board of Canada, Vol. 346, pp. 1-8.
- Hurley, P.C.F., S. Corey & T.D. Iles, 1983. Distributional patterns of chaetognaths in the Bay of Fundy. Can. J. Zool., Vol. 61, pp. 2257-2265.
- Husevåg, B. & B.T. Lunestad. 1995. Presence of fish pathogen *Aeromonas salmonicida* and bacteria resistant to antimicrobial agents in sediments from Norwegian fish farms. Bull. Eur. Assoc. Fish Path. 15: 17-19.
- Husevåg, B., B.T. Lunestad, P.J. Johannessen, Ø. Enger, & O.B. Samuelsen, 1991. Simultaneous occurrence of *Vibrio salmonicida* and antibiotic resistant bacteria in sediments at abandoned aquaculture sites. J. Fish Dis. 14:631-640.
- Hylland, K., M. Sandvik, J. Utre Skåre, J. Beyer, E. Egaas, & A. Goksøyr.1996. Biomarkers in flounder (*Platichthys flesus*): and evaluation of their use in pollution monitoring. Mar. Environ. Research 42 (1-4): 223-227
- ICES, 1999. Report of the working group on Environmental Interaction of Mariculture. ICES CM 1999/F:2. Mariculture Committee. Montpellier, France, March 15-20, 1999.
- Iles, T.D., 1975. Michael Graham's Bay of Fundy *Sagitta* patch revisited. Are these "stocks" of zooplankton animals? ICES, Vol. CM1975/L:24.
- Iles, T.D., 1979. The ecology of the herring fisheries of the Bay of Fundy. In: Evaluation of recent data relative to potential oil spills in the Passamaquoddy area, edited by D.J. Scarratt, Fish. Mar. Serv. Techn. Rep. No. 901, pp. 27-52.
- Ingersoll, L.K. & S.W. Gorham, 1978. A history of the mammals of Grand Manan. *Grand Manan Historian*, Vol. 20, pp. 31-54.
- Ingrid, G., T. Andersen, T., & O. Vadstein. 1997. Pelagic food webs and eutrophication of coastal waters: impact of grazers on algal communities. Mar. Poll. Bull. 33(1-6):22-35.
- International St. Croix River Engineering Board. 1957. Water Resources of the St. Croix River Basin, Maine-New Brunswick. Report on preliminary investigations to the International Joint Commission (Under the reference of 10 June 1955).
- Jacobi, C., 1984. Report on the Japanese tuna longline fishery 1983-1984. Canada. Department of Fisheries and Oceans (Scotia-Fundy Region). Observer Program. 28
- Jacobs, S.R. & J.M. Terhune, 2000. Harbour seal (*Phoca vitulina*) numbers along the New Brunswick coast of the Bay of Fundy in autumn in relation to aquaculture. Northeastern Naturalist, Vol. 7, pp. 289-296.
- Jackson, J.B.C., M.X. Kirby, W.H. Berger, K.A. Bjorndal, L.W. Botsford, B.J. Bourque, R.H. Bradbury, R. Cooke, J. Erlandson, J.A. Estes, T.P. Hughes, S. Kidwell, C.B. Lange, H.S. Lenihan, J.M. Pandolfi, C.H. Peterson, R.S. Steneck, M.A. Tegner & R.R. Warner. 2001. Historical overfishing and the recent collapse of coastal ecosystems. Science, Vol. 293, pp. 629-638.
- Jennings, S. & D.J. Scarratt, 1979. Tourism and recreation. In: Evaluation of recent data relative to potential oil spills in the Passamaquoddy area, edited by D.J. Scarratt, Fish. Mar. Serv. Tech. Rep., Vol. 901, pp. 97-99.
- Joint Commission. 1896. Report of the Joint Commission relative to the preservation of the fisheries of waters contiguous to Canada and the United States. Appendix to Fisheries Report.

- Johnsen, K., J. Tana, K. Lehtinen, T. Stuthridge, K. Mattsson, J. Hemming, & G.E. Carlberg. 1998. Experimental field exposure of brown trout to river water receiving effluent from an integrated newsprint mill. *Ecotoxicology and Environmental Safety*, 40(3): 184-193.
- Johnson, L.L., S.Y. Sol, G.M. Ylitalo, T. Hom, B. French, O.P. Olson & T.K. Collier. 1997. Precocious sexual maturation and other reproductive anomalies in English sole from an urban waterway. ICES CM 1997/U:07.
- Johnston, P, Santillo, D., & R. Stringer. 1996. Risk assessment and reality: recognizing the limitations, pp. 223-239. In: *Environmental impact of chemicals: assessment and control*. (eds. M.D. Quint, D. Taylor, and R. Purchase.) Spec. Publ. 176, Royal Society of Chemistry, Great Britain.
- Jones, C.C., 1912. Chairman's address. In: *Sea-fisheries of Eastern Canada*, The Mortimer Co., Ottawa. pp. 2-12.
- Jury, S.H., J.D. Field, S.L. Stone, D.M. Nelson & M.E. Monaco, 1994. Distribution and abundance of fishes and invertebrates in North Atlantic estuaries. ELMR Rep. No. 13, NOAA/NOS Strategic Environmental Assessments Division, Silver Spring, MD. 221 p.
- Kathman, R.D., S.F. Cross & M. Walichuk. 1984. Effects of wood waste on the recruitment potential of marine benthic communities. *Can. Tech. Rep. Fish. Aquat. Sci.* 1284: 50 p.
- Katona, S.K., V. Rough & D.T. Richardson, 1993. A field guide to whales, porpoises, and seals from Cape Cod to Newfoundland. Smithsonian Institution, Washington.
- Kennedy, C.J., L.E. McDonald, R. Loveridge, & M.M. Strosher. 2000. The effect of bioaccumulated selenium on mortalities and deformities in the eggs, larvae, and fry of a wild population of cutthroat trout (*Oncorhynchus clarki lewisi*). *Arch. Environ. Contam. Toxicol.* 39: 46-52
- Kerry, J., R. Coyne, D. Gilroy, M. Hiney, & P. Smith. 1996. Spatial distribution of oxytetracycline and elevated frequencies of oxytetracycline resistance in sediments beneath a marine salmon farm following oxytetracycline therapy. *Aquaculture*, 145 (1-4): 31-39.
- Kerswill, C.J., 1959. Effects of proposed Passamaquoddy power project on anadromous fishes in Canadian waters. In: *Studies in Fisheries Biology for the Passamaquoddy Power Project*, edited by I.P.F. Board, Report to the International Joint Commission. Chapter 12, 8 p.
- Kerswill, C.S., 1960. Effects of proposed Passamaquoddy power project on anadromous fishes in Canadian waters. *J. Fish. Res. Bd. Canada*, Vol. 17, pp. 713-720.
- Ketchum, B.H. & D.J. Keen. 1953. The exchanges of fresh and salt waters in the Bay of Fundy and in Passamaquoddy Bay. *J. Fish. Res. Bd. Can.* 10 (3): 97-124.
- Kingsford, M.J., I.M. Suthers, & C.A. Gray. 1996. Exposure to sewage plumes and the incidence of deformities in larval fishes. *Mar. Poll. Bull.* 33: 201-212
- Kirby, M.F., B.P. Lyons, M.J. Waldock, R.J. Woodhead, F. Goodsir, R.J. Law, P. Matthiessen, P. Neall, C. Steward, J.T. Thain, T. Tylor & S.W. Feist. 2000. Biomarkers of polycyclic aromatic hydrocarbons (PAH) exposure in fish and their application in marine monitoring. *Sci. Ser., Tech. Rep., CEFAS, Lowestoft* (110), 30 p.
- Klugh, A.B., 1917. The marine algae of the Passamaquoddy region, New Brunswick. *Contr. Canad. Biol.*, Vol. 1915-1916, pp. 79-85.
- Knowlton, A.R., S.D. Kraus & R.D. Kenney, 1994. Reproduction in North Atlantic right whales (*Eubalaena glacialis*). *Can. J. Zool.*, Vol. 72, pp. 1297-1305.
- Koeller, P., 2000. Relative importance of abiotic and biotic factors to the management of the Northern shrimp (*Pandalus borealis*) fishery on the Scotian Shelf. *J. Northw. Atl. Fish. Sci.*, Vol. 27, pp. 37-50.
- Kohler, A.C., 1979. Annual groundfish landings¹ and values¹ data for Charlotte County and Bay of Fundy ports for 1968-1978. In: *Evaluation of recent data relative to potential oil spills in the Passamaquoddy area*, edited by D.J. Scarratt, *Fish. Mar. Serv. Tech. Rep.*, Vol. 901, pp. 53-56.
- Kovacs, K.M., K.M. Jones & S.E. Welke, 1990. Sea and age segregation by *Phoca vitulina concolor* at haul-out sites during the breeding season in the Passamaquoddy Bay region, New Brunswick. *Mar. Mamm. Sci.*, Vol. 6, pp. 204-214.
- Kovacs, K.M. & S. Innes, 1990. The impact of tourism on harp seals (*Phoca groenlandica*) in the Gulf of St. Lawrence, Canada. *Appl. Anim. Behav. Sci.*, Vol. 26, pp. 15-26.

- Kraus, S.D.R., A.J. Solow, A. Baldwin, K. Spradlin, T. Anderson, & E. Williamson, 1997. Acoustic alarms reduce porpoise mortality. *Nature*, Vol. 388, pp. 525.
- Kruzynski, G.M. 1979. Some effects of dehydroabietic acid (DHA) on hydromineral balance and other physiological parameters in juvenile sockeye salmon *Oncorhynchus nerka*. Ph.D. Thesis, Department of Zoology, U.B.C., Vancouver, B.C. 187 p. cited in Samis et al 1999.
- Kulka, D.W., S. Corey & T.D. Iles, 1982. Community structure and biomass of euphausiids in the Bay of Fundy. *Can. J. Fish. Aquat. Sci.*, Vol. 39, pp. 326-334.
- Lack, T.J. & D. Johnson. 1985. Assessment of the biological effects of sewage sludge at a licensed site off Plymouth. *Mar. Poll. Bull.* 16(4): 147-152.
- Laist, D.W., A.R. Knowlton, J.G. Mead, A.S. Collet & M. Podesta, 2001. Collisions between ships and whales. *Mar. Mam. Sci.*, Vol. 17, pp. 35-75.
- Landahl, J.T., B.B. McCain, M.S. Myers, L.D. Rhodes & D.W. Brown. 1990. Consistent associations between hepatic lesions in English sole (*Parophrys vetulus*) and polycyclic aromatic hydrocarbons in bottom sediment. *Environ. Health Perspec.* 89: 195-203.
- Lauzier, L.M. 1967. Bottom residual drift on the continental shelf areas of the Canadian Atlantic coast. *J. Fish. Res. Board Canada.* 24: 1845-1859.
- Legare, J.E.H. & D.C. Maclellan, 1959. A qualitative and quantitative study of the plankton of the Quoddy Region in 1957 and 1958 with special reference to the food of herring. In: *Studies in Fisheries Biology for the Passamaquoddy Power Project*, edited by I.P.F. Board, Report to the International Joint Commission, Chapter 4, 31 p.
- Legare, J.E.H. & D.C. Maclellan, 1960. A qualitative and quantitative study of the plankton of the Quoddy Region in 1957 and 1958 with special reference to the food of the herring. *J. Fish. Res. Bd. Canada*, Vol. 17, pp. 409-448.
- Legare, J.E.H., 1961. The Zooplankton of the Passamaquoddy Region. *Fish. Res. Bd. Can. Man. Rep. Ser. Biol.*, Vol. 707, pp. 1-37.
- Leibee, G.L., R.K. Jansson, G. Nuessly & J.L. Taylor. 1995. Efficacy of emamectin benzoate and *Bacillus thuringiensis* at controlling diamondback moth (Lepidoptera: Plutellides) populations on cabbage in Florida. *Florida Entomologist* 78:82-96.
- Leighton, A.H., 1937. The twilight of the Indian porpoise hunters. *Natural History*, Vol. 40, pp. 410-416, 458.
- Levings, C.D. 1994. Ecological aspects of siting fish farms in coastal habitats, pp. 39-49. In: *Proceeding of the Canada-Norway Workshop on Environmental Impacts of Aquaculture* (ed. by A. Ervik, P.K. Hansen and V. Wennevik). Havforskninginstituttet, Bergen (Norway). *Fisken og Havet*, no 13.
- Limburg, K.E., 1999. Estuaries, ecology, and economic decisions: an example of perceptual barriers and challenges to understanding. *Ecol. Econ.*, Vol. 30, pp. 185-188.
- Livingstone, D., P. Lemaire, A. Matthews, L. Peters, D. Bucke & R.J. Law. 1993. Pro-oxidant, antioxidant, and 7-ethoxyresorufin-O-deethylase (EROD) activity responses in liver of dab (*Limanda limanda*) exposed to sediments contaminated with hydrocarbons and other chemicals. *Mar. Poll. Bull.* 26(11) 602-606.
- Lord, D.A. 1978. Effects of effluent control on the water quality of the St. Croix River. *St. Croix River Biology Workshop*. St. Andrews, New Brunswick. May 1978.
- Loring, D.H., T.G. Milligan, D.E. Willis & K.S. Saunders. 1998. Metallic and organic contaminants in sediments of the St. Croix Estuary and Passamaquoddy bay. *Can. Tech. Rep. Fish. Aquat. Sci.* 2245: v + 44 p.
- Lock, A.R., R.G.B. Brown & S.H. Gerriets, 1994. Gazetteer of marine birds in Atlantic Canada: an atlas of sea birds vulnerability to oil pollution. *Environment Canada Atlantic Region*, 137 p.
- Loder, J.W. & C. Garrett, 1978. The 18.6-year cycle of sea surface temperature in shallow seas due to variation in tidal mixing. *J. Geophys. Res.*, Vol. 83, pp. 1967-1970.
- Lotze, H.K., 1998. Population dynamics and species interactions in macroalgal blooms: abiotic versus biotic control at different life-cycle stages. *Ber. Inst. Meereskunde Kiel*, Vol. 303, pp. 1-134.
- Lotze, H.K., W. Schramm, D. Schories & B. Worm, 1999. Control of macroalgal blooms at early developmental stages: *Pilayella littoralis* versus *Enteromorpha* spp. *Oecologia*, Vol. 119, pp. 46-54.
- Lotze, H.K. & B. Worm, 2000. Variable and complementary effects of herbivores on different life stages of bloom-forming macroalgae. *Mar. Ecol. Prog. Ser.*, Vol. 200, pp. 167-175.

- Lotze, H.K., B. Worm & U. Sommer, 2000. Propagule banks, herbivory and nutrient supply control population development and dominance patterns in macroalgal blooms. *Oikos*, Vol. 89, pp. 46-58.
- Lotze, H.K., B. Worm & U. Sommer, 2001. Strong bottom-up and top-down control of early life stages of macroalgae. *Limnol Oceanogr*, Vol. 46, pp. 749-757.
- Luoma, S. N. 1999. Emerging contaminant issues from an ecological perspective In: U.S. Geological Survey Toxic Substances Hydrology Program, Proceedings of the Technical Meeting, Charleston, South Carolina, March 8-12, 1999. US. Geological Survey Water Resources Investigations Report 99-4018B, Vol. 2 of 3.
- Lye, C.M., C.L.J. Frid, M.E. Gill & D. McCormick. 1997. Abnormalities in the reproductive health of flounder *Platichthys flesus* exposed to effluent from a sewage treatment works. *Mar. Poll. Bull.* 34: 34-41.
- Macdonald, J.S., M.J. Dadswell, R.G. Appy, G.D. Melvin & D.A. Methven, 1984. Fishes, fish assemblages, and their seasonal movements in the lower Bay of Fundy and Passamaquoddy Bay, Canada. *Fish. Bull.*, Vol. 82, pp. 121-139.
- MacKay, A., 1976. Comments on EPA's draft environmental impact statement on the proposed Pittston oil refinery at Eastport, Maine. Environmental Protection Agency, Boston, MA, USA.
- MacKay, A.A., 1976. The sea urchin roe industry on New Brunswick's Bay of Fundy coast. Marine Research Associates, Fredericton, New Brunswick.
- MacKay, A., R. Bosien & B. Wells, 1978a. Bay of Fundy resource inventory. Vol. 1, St. Croix River - Passamaquoddy Bay. Marine Research Associates Ltd., Deer Island, Canada, 219 p.
- MacKay, A., R. Bosien & B. Wells, 1978b. Bay of Fundy resource inventory. Vol. 2, Back Bay - Letang Inlet. Marine Research Associates Ltd., Deer Island, Canada, 134 p.
- MacKay, A., R. Bosien & B. Wells, 1978c. Bay of Fundy resource inventory. Vol. 3, Deer Island - Campobello Island. Marine Research Associates Ltd., Deer Island, Canada, 233 p.
- MacKay, A., R. Bosien & P. Leslie, 1979a. Bay of Fundy resource inventory. Volume 4, The Grand Manan archipelago. Marine Research Associates Ltd., Deer Island, N.B., Canada, 141 p.
- MacKay, A., R. Bosien & P. Leslie, 1979b. Bay of Fundy resource inventory. Volume 5, the Wolves Islands. Marine Research Associates Ltd., Deer Island, N.B., Canada, 97 p.
- MacKay, A., R. Bosien & P. Leslie, 1979c. Bay of Fundy resource inventory. Volume 6, Pea Point to Point Lepreau. Marine Research Associates Ltd., Deer Island, N.B., Canada, 123 p.
- MacKay, K.T., 1967. An ecological study of mackerel, *Scomber scombrus* (Linnaeus), in the coastal waters of Canada. *Fish. Res. Bd. Can. Tech. Rep.*, Vol. 31, pp. 127.
- MAFF (Ministry of Agriculture, Fisheries and Food), 1995. Backgrounder: Sea lice update. October 23, 1995, Province of British Columbia. Cited in Ellis and Associates, 1996.
- Maine Bureau of Health. 2001. Bureau of Health Fish Tissue Action Levels, Updated 2/20/01.
- Maine Department of Environmental Protection (DEP). 1990. Report to the International Joint Commission.
- Maine Department of Environmental Protection (DEP). 2001.
<http://janus.state.me.us/dep/blwq/monitoring.htm>
- Malik, S.B., M.W. Kraus, S.D. Knowlton, A.R. Hamilton, & P.K. White. 1999. Assessment of mitochondrial DNA structuring and nursery use in the North Atlantic right whale (*Eubalaena glacialis*). *Can. J. Zool.*, Vol. 77, pp. 1217-1222.
- Marshall, T.L.. 1976. Historical perspectives of Resource Development Branch activities in restoring anadromous fishes to the St. Croix River, New Brunswick - Maine. Freshwater and Anadromous Division, Resource Branch, Fisheries and Marine Service, Department of Fisheries and the Environment, Halifax, Nova Scotia, Canada.
- Marshall, T.L., G.C. Chaput, P.G. Amiro, D.K. Cairns, R.A. Jones, S.F. O'Neill & J.A. Ritter, 1998. Assessment of Atlantic salmon stock of the Maritimes Region. CSAS Res. Doc., Vol. 99/25.
- Marshall, T.L., G.J. Chaput, P.G. Amiro, D.K. Cairns, R.A. Jones, S.F. O'Neill & J.A. Ritter, 1999. Assessments of Atlantic salmon stocks of the Maritimes Region, 1998. CSAS Res. Doc., Vol. 99/25.
- Martin, J.D. 1984. Atlantic salmon and alewife passage through a pool and weir fishway on the Magaguadavic River, New Brunswick, during 1983. *Can. Manuscr. Rep. Fish. Aquat. Sci.* 1776.
- Martin, J.L. & A.W. White. 1988. Distribution and abundance of the toxic dinoflagellate *Gonyaulax excavata* in the Bay of Fundy. *Can. J. Fish. Aquat. Sci.*, Vol. 45, pp. 1968-1975.

- Martin, J.L., K. Haya, L.E. Burrige & D.J. Wildish, 1990. *Nitzschia pseudodelicatissima* -- a source of domoic acid in the Bay of Fundy, eastern Canada. *Mar. Ecol. Prog. Ser.*, Vol. 6, pp. 177-182.
- Martin, J.L. & M.M. LeGresley, 1999. Aquaculture and blooms of *Alexandrium fundyense* and *Pseudo-nitzschia pseudodelicatissima* in the southwest Bay of Fundy. Sixth Canadian Workshop on Harmful Marine Algae, Department of Fisheries and Oceans, St. Andrews Biol. Stn., NB, Canada.
- Martin, J.L., M.M. LeGresley, P.M. Strain & P. Clement. 1999. Phytoplankton monitoring in the southwest Bay of Fundy during 1993-1996. *Can. Tech. Rep. Fish. Aquat. Sci.* 2265: iv + 132p.
- Martin, W.R., 1959. Predicted effects of proposed tidal power structures on groundfish catches in Charlotte county, N.B., Canada. In: *Studies in Fisheries Biology for the Passamaquoddy Power Project*, edited by I.P.F. Board, Report to the International Joint Commission, Chapter 7, 4 p.
- Martin, W.R., 1960. Predicted effects on proposed tidal power structures on groundfish catches in Charlotte County, N.B. *J. Fish. Res. Bd. Canada*, Vol. 17, pp. 169-173.
- Mate, B.R.N. & S.L. Kraus, 1997. Satellite-monitored movements of the northern right whale. *J. Wildl. Manag.*, Vol. 61, pp. 1393-1405.
- Matthiessen P., J.E. Thain, R.J. Law & T.W. Fileman. 1993. Attempts to assess the environmental hazard posed by complex mixtures of organic chemicals in UK estuaries. *Mar. Poll. Bull.*, 26(2): 90-95.
- Mattsoff, L. & A. Oikari. 1987. Acute hyperbilirubinaemia in rainbow trout (*Salmo gairdneri*) caused by resin acid. *Com. Biochem. Physiol.* 88C(2): 263-268.
- Mawhinney, K., A.W. Diamond, P. Kehoe & N. Benjamin, 1999. Status and productivity of Common Eiders in relation to Great Black-backed Gulls and Herring Gulls in the Southern Bay of Fundy and the Northern Gulf of Maine. *Waterbirds*, Vol. 22, pp. 253-262.
- Mazzola, A., S. Mirto, T. La Rosa, M. Fabiano & R. Danovaro. 2000. Fish-farming effects on benthic community structure in coastal sediments; analysis of meiofaunal recovery. *ICES J. Mar. Sci.* 57: 1454-1461.
- McAlpine, D.F. & R.H. Walker, 1990. Extralimital records of the harp seal, *Phoca groenlandica*, from the western North Atlantic: a review. *Mar Mamm Sci*, Vol. 6, pp. 248-252.
- McAlpine, D.F., 1997. Historical evidence does not suggest New Brunswick amphibians have declined. *Herpetological Conservation*, Vol. 1, pp. 117-127.
- McAlpine, D.F., P.T. Stevick, L.D. Murison & S.D. Turnbill, 1999a. Extralimital records of hooded seals (*Cystophora cristata*) from the Bay of Fundy and Northern Gulf of Maine. *Northeastern Naturalist*, Vol. 6, pp. 225-230.
- McAlpine, D.F., P.T. Stevick & L.D. Murison, 1999b. Increase in extralimital occurrences of ice-breeding seals in the northern Gulf of Maine region: more seals or fewer fish? *Mar Mamm Sci*, Vol. 15, pp. 906-911.
- McClelland, J.W. & I. Valiela. 1998. Changes in food web structure under the influence of increased anthropogenic nitrogen inputs to estuaries. *Mar. Ecol. Prog. Ser.* 168:259-271.
- McGhie, T.K., C.M. Crawford, I.M. Mitchell & D. O'Brian. 2000. The degradation of fish-waste in sediments during fallowing. *Aquaculture* 187(3-4): 351-366.
- McGreer, E.R., D.R. Munday, & M. Waldichuk. 1985. *Can. Tech. Rep. Fish. Aquat. Sci.* 1398: 29 p.
- McKenzie, R.A. & S.N. Tibbo, 1959. The herring fishery of Southern New Brunswick. In: *Studies in Fisheries Biology for the Passamaquoddy Power Project*, edited by I.P.F. Board, Report to the International Joint Commission, Chapter 1, 20 p.
- McKenzie, R.A. & S.N. Tibbo, 1960. Herring fishery in Southwestern New Brunswick. *J. Fish. Res. Bd. Canada*, Vol. 17, pp. 133-168.
- McLeese, D.W. & C.D. Metcalfe. 1979. Toxicity of creosote to larval and adult lobsters and Crangon and its accumulation in lobster hepatopancreas. *Bull. Environ. Contam. Toxicol.* 22: 796-799.
- McLeese, D.W., C.D. Metcalfe & V. Zitko. 1980. Lethality of permethrin, cypermethrin and fenvalerate to salmon, lobster and shrimp. *Bull. Environm. Contam. Toxicol.* 25: 950-955.
- McLeese, D.W., V. Zitko, D.B. Sergeant, L. Burrige & C.D. Metcalfe. 1981. Lethality and accumulation of alkylphenols in aquatic fauna. *Chemosphere* 10(7): 723-730.
- McLeese, D.W. 1983. The potential for exposure of lobsters to creosote during commercial storage in the Maritime provinces of Canada. *Can. Tech. Rep. Fish. Aquat. Sci.* 1203: iv + 28 p.
- McMurrich, J.P. 1917. The winter plankton in the neighbourhood of St. Andrews, 1914-1915. *Contr. Canad. Biol.*, Vol. 1915-1916, pp. 1-9.

- Meade, K.R., 2000. Considering fish biology and hydroelectric generation. A case study of the Black River Hydro System in Nova Scotia. M.Sc. Thesis, Dalhousie University, Halifax, Nova Scotia, Canada
- Medcof, J.C.L., A.B. Needler, A.W.H. Needler, J. Gibbard, & J. Naubert, 1947. Paralytic shellfish poisoning on the Canadian Atlantic coast. *Bull. Fish. Res. Bd. Can.*, Vol. 75, pp. 1-32.
- Medcof, J.C., 1959. Canadian molluscan shellfisheries and Passamaquoddy power development. In: *Studies in Fisheries Biology for the Passamaquoddy Power Project*, edited by the International Passamaquoddy Fisheries Board, Report to the International Joint Commission, pp. Chapter 11, 13 p.
- Melvin, G.D., 1976. A collection of fishes from Passamaquoddy Bay, New Brunswick. Hunstman Marine Laboratory Report, St. Andrews, New Brunswick, 27 p.
- Menon, A.S. & C.E. McDonald. A microbiological study of the waste characteristics of a maritime fish processing plant. Surveillance Report EPS-5-Ar-78-4. Environmental Protection Service, Atlantic Region. 20 p.
- Mercier, F.M. & D.E. Gaskin, 1985. Feeding ecology of migrating Red-necked Phalaropes (*Phalaropus lobatus*) in the Quoddy region, New Brunswick, Canada. *Can. J. Zool.*, Vol. 63, pp. 1062-1067.
- Middlebrook, K. & J.C. Roff, 1986. Comparison of methods for estimating annual productivity of the copepods *Acartia hudsonica* and *Eurytemora herdmani* in Passamaquoddy Bay, New Brunswick. *Can. J. Fish. Aquat. Sci.*, Vol. 43, pp. 656-664.
- Milewski, I., J. Harvey & B. Buerkle, 1997. After the gold rush: The status and future of salmon aquaculture in New Brunswick. Conservation Council of New Brunswick, Fredericton, NB, Canada.
- Miller, D.S. & T.D. Iles. 1975. Catch statistics for the Bay of Fundy herring fisheries 1963-1974. *Fish. Mar. Serv. Tech. Rep.*, Vol. 594, 75 p.
- Milne, W.R. & S. Corey, 1986. Distributional patterns of the ctenophores *Pleurobrachia pileus* and *Beroe cucumis* in the Bay of Fundy region, Canada. *Can. J. Zool.*, Vol. 64, pp. 2639-2644.
- Mitnik, P. 1986. St. Croix waste load allocation 1986. Department of Environmental Protection, Maine. 38 p.
- Morrison, R.I.G., C. Downes & B. Collins, 1994. Population trends of shorebirds on fall migration in eastern Canada 1974-1991. *Wilson Bulletin*, Vol. 106, pp. 431-447.
- Morrison, R.I.G., C. Downes & B.T. Collins, 1997. Monitoring shorebird populations in Canada: The Maritimes Shorebird Survey and shorebird population trends, 1974-1991. In: *Monitoring bird populations: the Canadian experience*, edited by E.H. Dunn, M.D. Cadman & J.B. Falls, Environment Canada, pp. 24-29.
- Mourne, I., 1937. Disease of eelgrass (*Zostera marina*). *Biol. Bd. Can. Manusc. Rep. Biol. Stat.*, Vol. 120.
- Murison, L.D. & D.E. Gaskin, 1989. The distribution of right whales and zooplankton in the Bay of Fundy, Canada. *Can. J. Zool.*, Vol. 67, pp. 1411-1420.
- Murphy, B.M. & D.W. Black, 1996. Zooarchaeology in the Canadian Maritimes. *Can. Zooarchaeol.*, Vol. 9, pp. 2-20.
- Myers, M.S., J.T. Landahl, M.M. Krahn & B.B. McCain. 1991. Relationship between hepatic neoplasms and related lesions and exposure to toxic chemicals in marine fish from the U.S. west coast. *Environ. Health Perspec.* 90:7-15.
- Myers, R.A., N.J. Barrowman, J.A. Hutchings & A.A. Rosenberg, 1995. Population dynamics of exploited fish stocks at low population levels. *Science*, Vol. 269, pp. 1106-1108.
- Myers, R.A. & N.J. Barrowman, 1996. Is fish recruitment related to spawner abundance. *Fish. Bull*, Vol. 94, pp. 707-724.
- Naylor, S.J. and R.D. Moccia & G.M. Durant. 1999. The chemical composition of settleable solid fish waste (manure) from commercial Rainbow trout farms in Ontario, Canada. *N. Am. J. Aquacult.* 61(1): 21-26.
- Needler, A.W.H., 1931. The migration of haddock and the interrelationships of haddock populations in North American waters. *Contr. Canad. Biol. Fish.*, Vol. 6, pp. 241-314.
- NEFSC (Northeast Fisheries Science Center), 1999. U.S. Atlantic Marine Mammal Stock Assessments -- 1998. Northeast Fisheries Science Center, NOAA, Woods Hole, Massachusetts, NOAA Technical Memorandum NMFS-NE-116.
- Neish, I.C., 1973. The distribution of kelp and other commercially useful marine algae in Charlotte County, New Brunswick. Technical report to the New Brunswick Department of Fisheries and Environment. Applied Marine Research, Halifax, NS, Canada.

- Neish, I.C., 1973. The distribution of sea urchins in Charlotte County, New Brunswick. Technical report to the New Brunswick Department of Fisheries and Environment. Applied Marine Research, Halifax, NS, Canada.
- New Brunswick Dept. of Environment and Local Government (DELG). 2001. List of fish plant approvals and classification for effluent quality approvals.
- Newman, L.J. & S. Corey, 1984. Aspects of the biology and distribution of pteropods (Gastropoda; Opisthobranchia) from the Bay of Fundy region, Canada. *Can. J. Zool.*, Vol. 62, pp. 397-404.
- Nickell, T. 2000. The effects of emamectin benzoate on infaunal polychaetes. Final report DML Project 20898 for Schering-Flough Animal Health. DML Internal Report 226. 161 p.
- Nol, E. & D.E. Gaskin, 1987. Distribution and movements of Black Guillemots (*Cephus grylle*) in coastal waters of the southwestern Bay of Fundy, Canada. *Can. J. Zool.*, Vol. 65, pp. 2682-2689.
- NRC (National Research Council), 2000. Clean coastal waters: understanding and reducing the effects of nutrient pollution. National Academy Press, Washington, DC.
- NRC (Natural Resources Consultants, Inc.). 1997. Escaped Farm Salmon: Environmental and ecological concerns. Prepared for Government of British Columbia Environmental Assessment Office. 151 pp.
- Nutt, S. 1974. Maritime fish processing plant effluent study. Economic and Technical Report EPS-3-WP-74-2. Water Pollution Control Directorate, Burlington, Ontario. 68 p.
- Nygaard, K., B.T. Lunestad, H. Hektoen, J.A. Berge & V. Hormazabal. 1992. Resistance to oxytetracycline, oxolinic acid and furazolidone in bacteria from marine sediments. *Aquaculture* 104:31-36.
- Oikari, A., B. Holmborn & H. Bister. 1982. Uptake of resin acids into tissues of trout (*Salmo gairdneri*). *Annales Zoologicae Fennicae* 19: 61-64. Cited in Samis et al. 1999.
- O'Neill, H.J. 1988. An assessment of Atlantic Region Water Quality Branch toxic chemical data 1980-1987. IW/L-AR-WQB-88-140. Water Quality Branch, Environment Canada (Moncton). 30 p.
- Overnall, J. & M.I. Abdullah. 1988. Metallothionein and metal levels in flounder *Platichthys flesus* from four field sites and in flounder dosed with water-bourne copper. *Mar. Eco. Prog. Ser.* 46: 71-74.
- Oviatt, C.A., J.G. Quinn, J.T. Maughan, J. Taylor Ellis, B.K. Sullivan, J.N. Gearing, P.J. Gearing, C.D. Hunt, P.A. Sampou & J.S. Latimer. 1987. Fate and effects of sewage sludge in the coastal marine environment: a mesocosm experiment. *Mar. Ecol. Prog. Ser.* 41:187-203.
- Owen, J.W., S.M. Swanson & D.A. Birkholz. 1994. Environmental monitoring of bleached kraft pulp mill chlorophenicol compounds in a northern Canadian River system. *Chemosphere* 29(1): 89-109.
- Pace, M.L., J.J. Cole, S.R. Carpenter & J.F. Kitchell, 1999. Trophic cascades revealed in diverse ecosystems. *Trends Ecol. Evol.*, Vol. 14, pp. 483-488.
- Parker, R. & N. Smith. 1997. A synopsis of the first cycle of the Pulp and Paper Mill Environmental Effects Monitoring Program in the Atlantic region. Environmental Protection Branch, Dartmouth, Nova Scotia. 48 p.
- Parrett, A. 1998. Pollution impacts on North Sea fish stocks. Prepared on behalf of the European Commission, DG XIV - Fisheries. World Wildlife Fund- U.K, Surrey, England. 122 p. + appendices.
- Parrish, B.B., 1958. An appraisal of the Passamaquoddy herring problem. *Fish. Res. Bd. Canada, Man. Rep.* Ser. No. 668.
- Pauly, D. & V. Christensen, 1995. Primary production required to sustain global fisheries. *Nature*, Vol. 374, pp. 255-257.
- Pauly, D., V. Christensen, J. Dalsgaard, R. Froese & F. Torres Jr. 1998. Fishing down marine food webs. *Science*, Vol. 279, pp. 860-863.
- Peacock, F.G. 1979. Processing plants in Charlotte County and elsewhere in the Bay of Fundy. pp.57-60. *In*. Evaluation of recent data relative to potential oil spills in the Passamaquoddy Area. Ed. By D.J. Scarratt. Fisheries and Marine Service Technical Report 901.
- Pearce, P.A., D.B. Peakall & L.M. Reynolds. 1979. Shell thinning and residues of organochlorines and mercury in seabird eggs, Eastern Canada, 1970-76. *Pestic. Monit. J.*, 13(2): 61-68.
- Pearce, P.A., J.E. Elliot & D.B. Peakall. 1989. Organochlorine contaminants in eggs of seabirds in the northwest Atlantic, 1968-1984. *Environ. Pollut.* 56: 217-235.

- Pearson, T.H. & R. Rosenberg. 1978. Macrobenthic succession in relation to organic enrichment and pollution of the marine environment. *Oceanogr. Mar. Bio. Ann. Rev.* 16: 229-311.
- Penhallow, D.P., 1912. Report on the Atlantic Biological Station of Canada, St. Andrews, N.B., for 1908. *Contrib. Can. Biol.*, Vol. 1906-1910, pp. 1-21.
- Peppin, D.S., M.S. Peppin & G.J. MacDonald, 1970. Report on preliminary survey of sub-littoral seaweeds in Bay of Fundy area, including Passamaquoddy Bay, and area between Deadman Harbour and Beaver Harbour. Malpeque Shellfish Incorporated Charlottetown, P.E.I, 13 p.
- Percy, J.A., P.G. Wells & A.J. Evans, 1996. Bay of Fundy Issues: a scientific overview. Workshop Proceedings, January 29 - February 1, 1996, Wolfville, Nova Scotia, Environment Canada Atlantic Region Occasional Report No. 8.
- Percy, J.A., 1996a. Expanding Fundy's harvest - targeting untapped treasures. Fundy Issues, Bay of Fundy Ecosystem Partnership fact sheet, Vol. 10, pp. 1-6.
- Percy, J.A., 1996b. The seaweed forest. Rockweed harvesting in the Bay of Fundy. Fundy Issues, Bay of Fundy Ecosystem Partnership fact sheet, Vol. 4, pp. 1-4.
- Percy, J.A., 1996c. Fundy's watery wastes? Pollution in the Bay of Fundy. Fundy Issues, Bay of Fundy Ecosystem Partnership fact sheet, Vol. 8, pp. 1-6.
- Percy, J.A., 1996d. Farming Fundy's fishes. Aquaculture in the Bay of Fundy. Fundy Issues, Bay of Fundy Ecosystem Partnership fact sheet, Vol. 7, pp. 1-4.
- Percy, J.A., 1996e. Right Whales - Wrong Places? North Atlantic Right Whales in the Bay of Fundy. Fundy Issues, Bay of Fundy Ecosystem Partnership fact sheet, Vol. 6, pp. 1-4.
- Percy, J.A., 2000a. Fishing in Fundy - harming seafloor habitats? Fundy Issues, Bay of Fundy Ecosystem Partnership fact sheet, Vol. 14, pp. 1-12.
- Percy, J.A., 2000b. Salt marsh saga - conserving Fundy's marine meadows. Fundy Issues, Bay of Fundy Ecosystem Partnership fact sheet, Vol. 16, pp. 1-12.
- Perley, M.H., 1852. Reports on the sea and river fisheries of New Brunswick. Simpson, Fredericton, New Brunswick.
- Peterson, T.D., H.L. Schaefer, J.L. Martin & I. Kaczmarek, 1999. *Chaetoceros furcillatus* Bailey in the Canadian Maritimes. *Bot. Mar.*, Vol. 42, pp. 253-263.
- Peters, G.B., H.J. Dawson, B.F. Hrutfiord & R.R. Whitney. 1976. Aqueous leachate from western red cedar: effects on some aquatic organisms. *J. Fish. Res. Board Can.* 33: 2703-2709.
- Peterson, R.H., F. Page, G.D. Steeves, D.J. Wildish, P. Harmon & R. Losier. 2001. A survey of 20 Atlantic salmon farms in the Bay of Fundy: Influences of environmental and husbandry variables on performance. *Can. Tech. Rep. Fish. Aquatic. Sci.* 2337: v + 117 p.
- Pettingill, S.O., 1939. The bird life of the Grand Manan archipelago. *Proc. Nova Scotian Inst. Sci.*, Vol. 19, pp. 293-439.
- Plissner, J.H. & S.M. Haig, 2000. Viability of piping plover *Charadrius melodus* metapopulations. *Biol. Conserv.*, Vol. 92, pp. 163-173.
- Pohle, G. & B. Frost. 1997. Establishment of standard benthic monitoring sites to assess long-term ecological modification and provide predictive sequence of benthic communities in the inner Bay of Fundy, New Brunswick. Huntsman Marine Science Centre. St. Andrews, Canada. 119 pp.
- Pohle, G., 1999. Benthos assessment at fallow sites. Atlantic Reference Centre, Huntsman Marine Science Centre, St. Andrews, New Brunswick.
- Pohle, G., B. Frost & R. Findlay. 2001. Assessment of regional benthic impact of salmon mariculture within the L'Etang Inlet, Bay of Fundy. *ICES J. Mar. Sci.* 58: 00-00.
- Poole, N.J., D.J. Wildish & N.A. Lister. 1976. Effects of a neutral-sulphite, pulp effluent on some chemical and biological parameters in the L'Etang inlet, New Brunswick. L'Etang Inlet Survey III. *Fish. Res. Board Can. Manusc. Rep. Ser.* 1404. 18 p.
- Poole, N.J., R.J. Parkes & D.J. Wildish. 1977. Reaction of estuarine ecosystem to effluent from pulp and paper industry. *Helgol. Meeresunters.* 30: 622-632.
- Poole, N.J., D.J. Wildish & D.D. Kristmanson. 1978. The effects of the pulp and paper industry on the aquatic environment. *CRC Crit. Rev. Environ. Control* 8: 153-195.

- Poole, N.J. & D.J. Wildish. 1979. Polysaccharide degradation in estuaries, pp. 399-416. In R.C.W. Berkly, D.C. Elwood, and G.W. Gooday (eds.) Microbial polysaccharides and their degradation. Academic Press, London.
- Prescott, J.H. & P.M. Fiorelli, 1980. Review of the harbor porpoise (*Phocoena phocoena*) in the U.S. North Atlantic. Final report to U.S. Marine Mammal Commission, Washington, Vol. MMC-78/08.
- Prince, E.E., 1912. The shad fishery of Canada and its restoration. In: Sea-fisheries of Eastern Canada, The Mortimer Co., Ottawa. pp. 120-139.
- Pringle, J.D., G.J. Sharp & J.F. Caddy, 1980. Proceedings of the workshop on the relationship between sea urchin grazing and commercial plant/animal harvesting. Can. Tech. Rep. Fish. Aquat. Sci., Vol. 954, pp. 1-273.
- Prouse, N.J. 1994. Ranking harbours in the Maritime provinces of Canada for potential to contaminate American lobster (*Homarus americanus*) with polycyclic aromatic hydrocarbons. Can. Tech. Rep. Fish. Aquat. Sci. 1960: v + 50 p.
- Raffaelli, D.G., J. Raven & L. Poole, 1998. Ecological impact of macroalgal blooms. Oceanogr. Mar. Biol. Ann. Rev., Vol. 36, pp. 97-125.
- Rainer, R. 1999. Non-point source pollution in the St. Stephen watershed: an initial assessment. St. Croix Estuary Project. St. Stephen, New Brunswick. 30 p.
- Rangeley, R.W., 1994. The effects of seaweed harvesting on fishes: a critique. Environ. Biol. Fish., Vol. 39, pp. 319-323.
- Rangeley, R.W. & D.L. Krammer. 1995. Use of rocky intertidal habitats by juvenile pollock. Mar. Ecol. Prog. Ser. 126: 9-17.
- Rangeley, R.W., 2000. Aquatic macrophytes as foraging and refuging habitats for fish. In: Gulf of Maine Rockweed: Management in the face of scientific uncertainty. Proceedings of the GPAC workshop., St. Andrews, New Brunswick, Huntsman Marine Science Centre Occasional Report 00/1.
- Rangeley, R.W. & J. Davies, 2000. Gulf of Maine Rockweed: Management in the face of scientific uncertainty. Proceedings of the Global Programme of Action Coalition for the Gulf of Maine (GPAC) workshop, St. Andrews, New Brunswick, Huntsman Marine Science Centre Occasional Report 00/1
- Ray, S. & V. Jerome. 1987. Copper, zinc, cadmium and lead in scallops (*Placopecten magellanicus*) from the Maritimes. Can. Tech. Rep. Fish. Aquat. Sci. 1519: 29 p.
- Rees, R., 1995. St. Andrews and the Islands. Nimbus Publishing, Halifax, Nova Scotia, Canada.
- Reeves, R.R., J.G. Mead & S. Katona, 1978. The right whale, *Eubalaena glacialis*, in the Western North Atlantic. Rep. Int. Whal. Comm., Vol. 28, pp. 303-312.
- Reeves, R.R. & E. Mitchell, 1983. Yankee whaling for Right whales in the North Atlantic Ocean. Whalewatcher, Vol. 17, pp. 3-8.
- Reeves, R.R. & M.F. Barto, 1985. Whaling in the Bay of Fundy. Whalewatcher, Vol. 19, pp. 14-18.
- Reise, K., E. Herre & M. Sturm, 1989. Historical changes in the benthos of the Wadden Sea around the island of Sylt in the North Sea. Helgol. Meeresunters., Vol. 43, pp. 417-433.
- Riddle, M.J. and K. Shikaze. 1973. Characterization and treatment of fish processing plant effluents in Canada. Technology Development Report EPS-4-WP-73-2. Water Pollution Control Directorate, Burlington, Ontario. 44 p.
- Robert, G., M.J. Lundy & R.A. Chandler, 1984. Recent trends in the Grand Manan scallop fishery. Can. Tech. Rep. Fish. Aquat. Sci., Vol. 1267, pp. 1-78.
- Roberts, C.M. & J.P. Hawkins, 2000. Fully-protected marine reserves: a guide. WWF Endangered Seas Campaign, 1250 24th Street, NW, Washington, DC 20037, USA.
- Robichaud, D.A. & A. Campbell, 1991. Annual and seasonal size-frequency changes of trap-caught lobsters (*Homarus americanus*) in the Bay of Fundy. J. Northw. Atl. Fish. Sci., Vol. 11, pp. 29-37.
- Robichaud, D.A., P. Lawton & M.B. Strong, 2000. Exploratory fisheries for Rock Crab, *Cancer irroratus*, and Jonah Crab, *Cancer borealis*, in Canadian lobster fishing areas 34, 35, 36 & 38. CSAS Res. Doc., Vol. 2000/051, pp. 1-27.
- Robinson, S. & A. MacIntyre, 1993. The final report for the Canada-New Brunswick Cooperative Agreement with the Campobello Fishermen's Association. Technical report. Department of Fisheries and Oceans, Biological Station, St. Andrews, NB, Canada.

- Robinson, S.M.C., 1994. The green sea urchin *Strongylocentrotus droebachiensis*, fishery in the Bay of Fundy. In: The development of underutilized invertebrate fisheries in eastern Canada, edited by L. Gendron & S.M.C. Robinson, Can. Manuscr. Rep. Fish. Aquat. Sci. No. 2247, pp. 90-94.
- Robinson, S. & A. MacIntyre, 1995. The final report for the New Department of Fisheries and Aquaculture and the Cooperation Agreement on Economic Diversification. Technical report. Department of Fisheries and Oceans, Biological Station, St. Andrews, NB, Canada.
- Robinson, S.M.C., J.D. Martin, F.H. Page & R. Losier. 1996. Temperature and salinity characteristics of Passamaquoddy Bay and approaches between 1990 and 1995. Can. Tech. Rep. Fish. Aquat. Sci. 2139: iii + 56 p.
- Roff, J.W., 1983. Microzooplankton of the Quoddy Region. In: Marine and coastal systems of the Quoddy region, New Brunswick, edited by M.L.H. Thomas, Can. Spec. Publ. Fish. Aquat. Sci., No. 64, pp. 201-214.
- Rosenfeld, M., M. George & J.M. Terhune, 1988. Evidence of autumnal harbour seal, *Phoca vitulina*, movement from Canada to the United States. Can. Field. Nat., Vol. 102, pp. 527-529.
- Rosenthal, H., M. McInerney-Northcott, C.J. Musial, J.F. Uthe & J.D. Castell. 1986. Viable hatch and organochlorine contaminant levels in gonads of fall spawning Atlantic herring from Grand Manan, Bay of Fundy, Canada. ICES 1986/E:26.
- Roth, M., R.H. Richards & C.S. Sommerville. 1993. Current practices in the chemotherapeutic control of sea lice infestations in aquaculture: a review. J. Fish Dis. 16:1-26.
- Roth, M. 2000. The availability and use of chemotherapeutic sea lice control products. Contributions to Zoology, 69(1-2): 109-118.
- Roy, W.J., I.H. Sutherland, H.D.M. Rodger & K.J. Varma. 2000. Tolerance of Atlantic salmon, *Salmo salar* L., and rainbow trout, *Onchorhynchus mykiss* (Walbaum), to emamectin benzoate, a new orally administered treatment for sea lice.
- Samis, S.C., S.D. Liu, B.G. Wernick, & M.D. Nassichuk. 1999. Mitigation of fisheries impacts from the use and disposal of wood residue in British Columbia and the Yukon. Can. Tech. Rep. Fish. Aquat. Sci. 2296: viii and 91 p.
- Samuelsen, O.B., B.T. Lunestad, B. Husevåg, T. Hølleland & A. Ervik. 1992. Residues of oxolinic acid in wild fauna following medication in fish farms. Dis. Aquat. Org. 12:111-119.
- Samuelsen, O.B. 1994. Environmental Impact of Antibacterial Agents in Norwegian Aquaculture. 107-113. In: Proceeding of the Canada-Norway Workshop on Environmental Impacts of Aquaculture (ed. by A. Ervik, P.K. Hansen & V. Wennevik). Havforskningsinstituttet, Bergen (Norway). *Fisken og Havet*, no 13.
- Santoro E.D. & T.J. Fikslin. 1987. Chemical and toxicological characteristics of sewage sludge ocean dumped in the New York Bight. Mar. Poll. Bull. 18(7): 394-399.
- Sauer, J.R., J.E. Hines, I. Thomas, J. Fallon & G. Gough, 2000. The North American Breeding Bird Survey, Results and Analysis 1966 - 1999. Version 98.1, USGS Patuxent Wildlife Research Center, Laurel, MD, USA.
- Savchuk, O. & F. Wulff, 1999. Modelling regional and large-scale response of Baltic Sea ecosystems to nutrient load reductions. Hydrobiologia, Vol. 393, pp. 35-43.
- Scarratt, D.J., 1979. Evaluation of recent data relative to potential oil spills in the Passamaquoddy area. Fish. Mar. Serv. Tech. Rep., Vol. 901, 107 p.
- Scattergood, L.W. & L.J. Lozier, 1964. Herring fishery of the U.S. Passamaquoddy region. U.S. Fish and Wildlife Service, Spec. Sci. Rep. Fish. No. 476, Vol. pp. 1-21.
- SCEP (St. Croix Estuary Project). 1996. Report on 1995 New Brunswick sewage treatment plant monitoring. SCEP (St. Croix Estuary Project), 1997. St. Croix estuary area - a profile. St. Croix Estuary Project, St. Andrews, New Brunswick.
- Schaeff, C.M., S.D. Kraus, M.W. Brown & B.N. White, 1993. Assessment of the population structure of western North Atlantic right whales (*Eubalaena glacialis*) based on sighting and mtDNA data. Can. J. Zool., Vol. 71, pp. 339-345.
- Schramm, W. & P.H. Nienhuis, 1996. Marine Benthic Vegetation - Recent Changes and the Effects of Eutrophication. Springer, Berlin.

- Schulte-Oehlmann, U., J. Oehlmann, B. Watermann, B. Bauer, I. Ide & P. Fiorino, 1996. Effekte von Tributylzinn (TBT) aus Antifoulinganstrichen auf Schneckenpopulationen in der Ostsee. In: Warnsignale aus der Ostsee, edited by J.L. Lozán, R. Lampe, W. Matthäus et al, Parey, Berlin. pp. 176-179.
- Scott, F.H., 1902. Food of the sea urchin (*Strongylocentrotus droebachiensis*). Contr. Can. Biol., Vol. 1902, pp. 49-54.
- Sergeant, D.B. & V. Zitko. 1978. PH and sulfate data of rainwater for July to August 1977 at the Biological Station, St. Andrews, N.B. Fish. Mar. Serv. MS Rep. 1468, 6 p.
- Sergeant, D.B., V. Zitko & L.E. Burrige, 1981. Sampling, analysis, and data evaluation of precipitation at St. Andrews, New Brunswick, Canada, 1978-80. Can. Tech. Rep. Fish. Aquat. Sci. 1023, iii + 26 p.
- Shaw, R.W., 1997. Climate change and climate variability in Atlantic Canada. Workshop Proceedings, December 3-6, 1996, Halifax, Nova Scotia, Environment Canada Atlantic Region Occasional Report No. 9.
- Short, F.T. & S. Wyllie-Echeverria, 1996. Natural and human-induced disturbance of seagrasses. Environ. Conserv., Vol. 23, pp. 17-27.
- Simon, J.E. & P.A. Comeau, 1994. Summer distribution and abundance trends of species caught on the Scotian Shelf from 1970-1992, by research vessel groundfish survey. Can. Tech. Rep. Fish. Aquat. Sci., Vol. 1953, pp. 1-145.
- Sims, G.G., C.E. Cosham, J.R. Campbell & M.C. Murray. 1975. DDT residues in cod livers from the Maritime provinces of Canada. Bull. Environ. Contam. Toxicol. 14(4): 505-512.
- SLDF (Sierra Legal Defense Fund). 1994. National Sewage Report Card: Rating the treatment methods and discharges of 20 Canadian cities. Sierra Legal Defense Fund, Vancouver, B.C. 51 p.
- SLDF (Sierra Legal Defense Fund). 2001. Pulping the law: How pulp mills are ruining Canadian waters. Toronto. 32 p.
- Smayda, T.J., 1997. Harmful algal blooms: Their ecophysiology and general relevance to phytoplankton blooms in the sea. Limnol. Oceanogr., Vol. 42, pp. 1137-1153.
- Smith, G.J.D., C.L. Jovellanos & D.E. Gaskin, 1984. Near-surface bio-oceanographic phenomena in the Quoddy Region, Bay of Fundy. Can. Tech. Rep. Fish. Aquat. Sci., Vol. 1280, pp. 1-124.
- Smith, R.J. & A.J. Read, 1992. Consumption of euphausiids by harbour porpoise (*Phocoena phocoena*) calves in the Bay of Fundy. Can. J. Zool., Vol. 70, pp. 1629-1632.
- Smith, T.D., 1994. Scaling fisheries: the science of measuring the effects of fishing, 1855-1955. Cambridge, University Press, Cambridge, USA.
- Sochasky, L. 2001. St. Croix International Waterway Commission, St. Stephen, NB. Pers. comm to I. Milewski.
- Sommer, U., 1998. Biologische Meereskunde. Springer, Berlin.
- Sowles, J., R. Crawford, J. Machell, P. Hennigar, S. Jones, J. Pederson, K. Coombs, G. Atkinson, D. Taylor, G. Harding, M. Chase, & W. Robinson. 1996. Evaluation of Gulfwatch 1993 - Third year of the Gulf of Maine Environmental Monitoring Plan. The Gulf of Maine Council on the Marine Environment, State Planning Office, Augusta, ME. 128 p.
- Spalding, M.G., P.C. Frederick, H.C. McGill, S.N. Bouton and L.R. McDowell. Methylmercury accumulation in tissues and its effects on growth and appetite in captive great egrets. J. Wild. Dis. 36(3) 411-422.
- Spiess, A.E., E. Trautman & T. Kupferschmid, 1990. Prehistoric occupation at Reversing Falls. Unpublished file report, Maine Historic Preservation Commission, Augusta, Maine, pp. 1-28.
- Sprague, J.B., J.R. Duffy & W.G. Carson. 1969. Measurement of DDT residues in marine commercial fish and shellfish collected in Atlantic Canada in 1976. Fish. Res. Board. Can. Manusc. Rep. 1061.
- Squires, W.A., 1946. Changes in mammal population in New Brunswick. Acadian Naturalist, Vol. 2, pp. 26-44.
- Squires, W.A., 1976. The birds of New Brunswick. New Brunswick Museum Monogr. Ser., Vol. 7, pp. 1-221.
- St. Croix International Waterway Commission. 1997. 1997 Oak Bay Project at Oak Bay, Charlotte County, New Brunswick. St. Stephen, New Brunswick. 50 p. + appendices.
- St. Croix International Waterway Commission. 2000. Future water quality in the St. Croix watershed: a proposal for preliminary surface water classification under New Brunswick's *Clean Water Act*. St. Stephen, New Brunswick. 153 p.

- Stafford, J., 1901. The clam fishery of Passamaquoddy Bay. *Contrib. Can. Biol.*, Vol. 1-2, pp. 19-40.
- Stafford, J., 1912. Conservation of the Oyster. In: *Sea-fisheries of Eastern Canada*, The Mortimer Co., Ottawa. pp. 25-49.
- Steele, D.H., 1963. Pollock (*Pollachius virens* (L.)) in the Bay of Fundy. *J. Fish. Res. Bd. Canada*, Vol. 20, pp. 1267-1314.
- Steneck, R.S., 1997. Fisheries-induced biological changes to the structure and function of the Gulf of Maine ecosystem. *Proceedings of the Gulf of Maine Ecosystem Dynamics Scientific Symposium and Workshop*, Hanover, NH, USA, Regional Association for the Research on the Gulf of Maine (RARGOM Report 91-1).
- Steneck, R.S., 1998. Human influences on coastal ecosystems: does overfishing create trophic cascades? *Trends Ecol. Evol.*, Vol. 11, pp. 429-430.
- Stephenson, R.L. & M.J. Power, 1988. Semidiel vertical movements in Atlantic herring *Clupea harengus* larvae: a mechanism for larval retention? *Mar. Ecol. Prog. Ser.*, Vol. 50, pp. 3-11.
- Stewart, J.E. 1998. Sharing the waters: An evaluation of site following, year class separation and distances between sites for fish health purposes on Atlantic salmon farms. *Can. Tech. Rep. Fish. Aquat. Sci.* 2218:vii +56 p.
- Stewart, P.L. & S.H. Arnold. 1994. Environmental requirements Atlantic herring (*Clupea harengus harengus*) in eastern Canada and its response to human impacts. *Can. Tech. Rep. Fish. Aquat. Sci.* 2003: ix + 37 p.
- Stobo, W.T.Z., 1990. Grey seal (*Halichoerus grypus*) pup production on Sable Island and estimates of recent production in the Northwest Atlantic. In: *Population biology of sealworm Pseudoterranova decipiens in relation to its intermediate and seal hosts*, edited by W.D. Bowen, Department of Fisheries and Oceans, Communications, Ottawa. pp. 171-184.
- Stobo, W.T. & G.M. Fowler, 1994. Aerial surveys of seals in the Bay of Fundy and off southwest Nova Scotia. *Can. Tech. Rep. Fish. Aquat. Sci.*, Vol. 1943, pp. 1-57.
- Stobo, W.T., 1996. Seals and seal issues. In: *Bay of Fundy Issues: a scientific overview*, edited by J.A. Percy, P.G. Wells & A.J. Evans, Environment Canada Atlantic Region Occasional Report No. 8, pp. 89-92.
- Stoewsand, G.S., C.A. Bache and D.J. Lisk. 1974. Dietary selenium protection of methylmercury intoxication of Japanese quail. *Bull. Environ. Contam. Toxicol.* 11: 152.
- Stone, J., I.H. Sutherland, C. Sommerville, R.H. Richards & K.J. Varma. 1999. The efficacy of emamectin benzoate as an oral treatment of sea lice, *Lepeophtheirus salmonis* (Krøyer), infestations in Atlantic salmon, *Salmo salar* L. *Journal of Fish Diseases* 22:261-270.
- Stone, J., I.H. Sutherland, C. Sommerville, R.H. Richards & K.J. Varma. 2000a. Field trials to evaluate the efficacy of emamectin benzoate in the control of sea lice, *Lepeophtheirus salmonis* (Krøyer) and *Caligus elongatus* Nordmann, infestations in Atlantic salmon, *Salmo salar* L. *Aquaculture* 186: 205-219.
- Stone, J., I.H. Sutherland, C. Sommerville, R.H. Richards & K.J. Varma. 2000b. Commercial trials using emamectin benzoate to control sea lice, *Lepeophtheirus salmonis* infestations in Atlantic salmon, *Salmo salar*. *Diseases of Aquatic Organisms* 41: 141-149.
- Strain, P.M., D.J. Wildish. & P.A. Yeats. 1995. The application of simple models of nutrient loading and oxygen demand to the management of a marine tidal inlet. *Mar. Pollut. Bull.* 30(4) 253-261.
- Strong, D.R., 1992. Are trophic cascades all wet? Differentiation and donor-control in speciose ecosystems. *Ecology*, Vol. 73, pp. 747-754.
- Strong, M.B., E.A. Trippel, D.S. Clark, J.D. Neilson & B.D. Chang, 1995. Potential impacts of use of acoustic deterrent devices (ADDs) on marine mammals in the Quoddy region based on a study conducted in British Columbia waters. *DFO Atl. Fish. Res. Doc.*, Vol. 95/127, pp. 1-4.
- Sunderland, E.M. & F.A.P.C. Gobas. 1999. The impact of mercury contamination on a coastal ecosystem: development of a multimedia mercury cycling model for Passamaquoddy Bay, NB, pp. 84-85. In *Understanding change in the Bay of Fundy Ecosystem. Proceedings of the 3rd Bay of Fundy Science Workshop*, Mount Allison University, Sackville, New Brunswick, J. Ollerhead, P.W. Hicklin, P.G. Wells and K. Ramsay (eds.). Environment Canada, Atlantic Region Occasional Report No. 12, Environment Canada, Sackville, New Brunswick, 143 p.

- Sunderland, E & G.L. Chmura. 1999. Historical patterns of mercury loading in the Bay of Fundy Region, p. 82-83. In: Understanding Change in the Bay of Fundy Ecosystem, Proceedings of the 3rd Bay of Fundy Science Workshop, Mount Allison University, Sackville, New Brunswick. J. Ollerhead, P.W. Hicklin, P.W. Wells and K. Ramsey (eds.). Environment Canada, Atlantic Region Occasional Report No. 12, Environment Canada, Sackville New Brunswick, 143 pp.
- Swetnam, D.A.B. & H.G. Bernard, 1979. Diadromous fish landings in Charlotte county, N.B., and the Bay of Fundy 1970-78. In: Evaluation of recent data relative to potential oil spills in the Passamaquoddy area, edited by D.J. Scarratt, Fish. Mar. Serv. Tech. Rep. No. 901, pp. 9-13.
- Tasker, M.L., C.J. Camphusen, J. Cooper, S. Garthe, W.A. Montevecchi & S.J.M. Blaber, 2000. The impacts of fishing on marine birds. ICES J. Mar. Sci., Vol. 57, pp. 531-547.
- Tegner, M.J. & P.K. Dayton, 1999. Ecosystem effects of fishing. Trends Ecol. Evol., Vol. 14, pp. 261-262.
- Thomas, M.L.H., 1983. Marine and coastal systems of the Quoddy region, New Brunswick. Can. Spec. Publ. Fish. Aquat. Sci., Vol. 64, pp. 306.
- Thomas, M.L.H., 1994. Littoral communities and zonation on rocky shores in the Bay of Fundy, Canada: an area of high tidal range. Biol. J. Linn. Soc., Vol. 51, pp. 149-168.
- Thurlow and Associates and Environmental Control Associates Ltd. 1977. Literature review of wastewater characteristics and abatement technology in the wood and timber processing industry. EPS 3-WP-77-2, Water pollution Control Directorate, Fisheries and Environment Canada. 47 pp.
- Tibbo, S.N., J.E.H. Legare, L.W. Scattergood & R.F. Temple, 1959. Larval herring (*Clupea harengus* L.) in the Bay of Fundy and the Gulf of Maine. In: Studies in Fisheries Biology for the Passamaquoddy Power Project, edited by International Passamaquoddy Fisheries Board, Report to the International Joint Commission, Chapter 5, 26 p.
- Todd, E.C.D., T. Kuiper-Goodman, W. Watson-Wright, M.W. Gilgan, S. Stephen, J. Marr, S. Pleasance & et al. 1993. Recent illnesses from seafood toxins in Canada: Paralytic, amnesic and diarrhetic shellfish poisoning. In: Toxic phytoplankton blooms in the sea, edited by T.J. Smayda & Y. Shimizu, Elsevier, Amsterdam, Netherlands.
- Toews, P.R., 1980. The Canadian Atlantic shrimp fishery - prospects for development. Can. Ind. Rep. Fish. Aquat. Sci., Vol. 177, pp. 1-39.
- Train, R.E., A.W. Breidenbach, A. Cywin & E.H. Forsht. 1975. Development document for effluent limitations guidelines and new source performance standards for the fish meal, salmon, bottom fish, clam, oyster, sardine, scallop, herring and abalone segment of the canned and preserved fish and seafood processing industry point source category. U.S. Environmental Protection Agency. 485 p. Abstract only.
- Trippel, E.A., J.Y. Wang, M.B. Strong, L.S. Carter & J.D. Conway, 1996. Incidental mortality of harbour porpoise (*Phocoena phocoena*) by gill-net fishery in the lower Bay of Fundy. Can. J. Fish. Aquat. Sci., Vol. 53, pp. 1294-1300.
- Trippel, E.A., 1999. The first marine biological station in Canada: 100 years of scientific research at St. Andrews. Can. J. Fish. Aquat. Sci., Vol. 56, pp. 2495-2507.
- Trippel, E.A., M.B. Strong, J.M. Terhune & J.D. Conway, 1999. Mitigation of harbour porpoise (*Phocoena phocoena*) by-catch in the gillnet fishery in the lower Bay of Fundy. Can. J. Fish. Aquat. Sci., Vol. 56, pp. 113-123.
- Trites R.W. & C.J.R. Garrett. 1983. Physical oceanography of the Quoddy Region. pp. 9- 34. In Marine and Coastal Systems of the Quoddy Region, New Brunswick, Ed. by M.L.H. Thomas, Department of Fisheries and Oceans (Ottawa).
- Uthe, J.F., D.W. McLeese, G.R. Sirota & L.E. Burrige. 1984. Accumulation of polycyclic aromatic hydrocarbons by lobsters (*Homarus americanus*) held in a tidal pound. Can. Tech. Rep. Fish. Aquat. Sci. 1059: iii + 10 p.
- Uthe, J.F. & C.L. Chou. 1987. Cadmium in sea scallop (*Placopecten magellanicus*) tissues from clean and contaminated area. Can. J. Fish. Aquat. Sci. 44:91-98.

- Valiela I., G. Collins, J. Kremer, K. Lajtha, M. Geist, B. Seely, J. Brawley & C.H. Sham. 1997a. Nitrogen loading from coastal watershed to receiving estuaries: new method and application. *Ecol. Appl.* 7(2):358-380.
- Valiela, I., J. McClelland, J. Hauxwell, P.J. Behr, D. Hersh & K. Foreman, 1997b. Macroalgal blooms in shallow estuaries: Controls and ecophysiological and ecosystem consequences. *Limnol. Oceanogr.*, Vol. 52, pp. 1105-1118.
- Vethaak, A.D. & J.G. Jol. 1996. Disease of flounder *Platichthys flesus* in Dutch coastal and estuarine waters, with particular reference to environmental stress factors. I. Epizootiology of gross lesions. *Disease of Aquatic Organisms* 26: 81-97.
- Vitousek, P.M., 1994. Beyond global warming: Ecology and global change. *Ecology*, Vol. 75, pp. 1861-1876.
- Vitousek, P.M., H.A. Mooney, J. Lubchenco & J.M. Melillo, 1997. Human domination of Earth's ecosystems. *Science*, Vol. 277, pp. 494-499.
- Volpe, J., E. Taylor, D. Rimmer & B. Glickman. 2000. Evidence of natural reproduction of aquaculture-escaped Atlantic salmon in a coastal British Columbia river. *Conserv. Biol.* 14(3):1-6.
- Von Westernhagen, H., P. Cameron, V. Dethlefsen & D. Janssen. 1989. Chlorinated hydrocarbons in North Sea whiting (*Merlangus merlangus* L.), and effects on reproduction. I. Tissue burden and hatching success. *Helgoländer Meeresuntersuchungen* 43: 45-60.
- Walters, C. & J.F. Kitchell, 2001. Cultivation/depensation effects on juvenile survival and recruitment implications for the theory of fishing. *Can. J. Fish. Aquat. Sci.*, Vol. 58, pp. 1-12.
- Wang, J.Y., D.E. Gaskin & B.N. White, 1996. Mitochondrial DNA analysis of harbour porpoise, *Phocoena phocoena*, subpopulations in North American waters. *Can. J. Fish. Aquat. Sci.*, Vol. 53, pp. 1632-1645.
- Weiskel, P.K. & B.L. Howes. 1991. Quantifying dissolved nitrogen flux through a coastal watershed, *Water Resour. Res.* 27:2929-2939.
- Wells, P.G., P.D. Keizer, J.L. Martin, P.A. Yeats, K.M. Ellis & D.W. Johnston, 1996. The chemical environment of the Bay of Fundy. In: *Bay of Fundy Issues: a scientific overview*, edited by J.A. Percy, P.G. Wells & A.J. Evans, Environment Canada Atlantic Region Occasional Report No. 8, Wolfville, Nova Scotia. pp. 37-61.
- Weston, D.P. 1996. Environmental Considerations in the Use of Antibacterial Drugs in Aquaculture, pp 140-165. In: *Aquaculture and Water Resource Management*, pp. 50-80. (ed. by D.J. Baird, M.C.M. Beveridge, L.A. Kelly and J.F. Muir). Blackwell Science, U.K.
- White, A.W., 1981. Sensitivity of marine fishes to toxins from the red-tide dinoflagellate *Gonyaulax excavata* and implications for fish kills. *Mar. Biol.*, Vol. 65, pp. 255-260.
- White, A.W., 1982. Intensification of *Gonyaulax* blooms and shellfish toxicity in the Bay of Fundy. *Can. Tech. Rep. Fish. Aquat. Sci.*, Vol. 1064, pp. 15.
- Whoriskey, F., J. Carr, G. Lacroix & M. Stokesbury, 1998. A review and update of aquaculture impact studies carried out on the Magaguadavic River, Southern Bay of Fundy, New Brunswick. *CSAS Res. Doc.*, Vol. 98/155, pp. 37.
- Whoriskey, F. 2000. Infectious Salmon Anaemia: A review and the lessons learned from wild salmon on Canada's east coast, pp. 46-51. In: *Aquaculture and the Protection of Wild Salmon* (ed. by P. Gallagher and C. Orr), *Speaking for the salmon: workshop proceedings*. Simon Fraser University July 2000.
- Whyte, J.N.C., J.C. Davis & J.R. Forbes, 1997. Harmful algae in Canadian waters and management strategies. *Ocean Res.*, Vol. 19, pp. 161-171.
- Widdows, J. & D. Johnson. 1988. Physiological energetics of *Mytilus edulis*: scope for growth. *Mar. Eco. Prog. Ser.* 46: 113-121.
- Wilbur, J.R.H. & E. Wentworth. 1986. *Silver Harvest*. Goose Lane Editions, Fredericton, Nova Scotia. 95 p.
- Wilder, D.G., 1960. Possible effects of Passamaquoddy tidal power structures on the Canadian lobster industry. *J. Fish. Res. Bd. Canada*, Vol. 17, pp. 553-563.

- Wilder, D.G., P.F. Elson, D.E. Gaskin, A.C. Kohler, W.T. Stobo & S.N. Tibbo, 1974. Renewable marine resources. In: Summary of physical, biological, socio-economic and other factors relevant to potential oil spills in the Passamaquoddy region of the Bay of Fundy, edited by Environment Canada, Fish. Res. Bd. Canada Tech. Rep. 428, pp. 103-138.
- Wildish, D.J., N.J. Poole & D.D. Kristmanson. 1979. Pulp mill pollution in L'Etang estuary, a case history and clean-up alternatives. Fish. Mar. Serv. Tech. Rep. 884: iii + 6 p.
- Wildish, D.J., J.L. Martin, A.J. Wilson & M. Ringuette. 1990. Environmental monitoring of the Bay of Fundy salmonid mariculture industry during 1988-1989. Can. Tech. Rep. Fish. Aquat. Sci. 1760: iii + 123 p.
- Wildish, D.J. & V. Zitko. 1991. Chemical oceanographic conditions in Blacks Harbour, N.B., 1989-91. Can. Manuscr. Rep. Fish. Aquat. Sci. 2132: iii + 11 p.
- Wildish, D.J., P.D. Keizer, A.J. Wilson & J.L. Martin, 1993. Seasonal changes of dissolved oxygen and plant nutrients in seawater near salmonid net pens in the macrotidal Bay of Fundy. Can. J. Fish. Aquat. Sci., Vol. 50, pp. 303-311.
- Wildish, D.J., H.M. Akagi, N. Hamilton & B.T. Hargrave. 1999. A recommended method for monitoring sediments to detect organic enrichment from mariculture in the Bay of Fundy. Can. Tech. Rep. Fish. Aquat. Sci. 2286: iii + 31 p.
- Willey, A., 1915. The plankton in St. Andrew's Bay. Contr. Can. Biol, Vol. 1911-1914, pp. 1-9.
- Williamson, A.M., 1992. Historical lobster landings for Atlantic Canada, 1892-1989. Can. Manuscr. Rep. Fish. Aquat. Sci., Vol. 2164, pp. 110.
- Willis, K., G. Tarling, and K. Black. 2001. The toxicity of sea lice chemotherapeutants to non-target planktonic copepods. Abstract on web site: <http://www.sams.ac.uk/dml/projects/zooplank/toxic/htm>
- Wilson, G.A.C., 1956. St. Croix River. Department of Fisheries, Fish Culture Development Branch, Canada.
- Winn, H.E., 1950. The Black Guillemot of Kent Island. Auk, Vol. 67, pp. 477-485.
- Woodley, T.H.R., 1991. Potential rates of increase of a harbour porpoise (*Phocoena phocoena*) population subjected to incidental mortality in commercial fisheries. Can. J. Fish. Aquat. Sci., Vol. 48, pp. 2429-2435.
- Woodley, T.H., M.W. Brown, S.D. Kraus & D.E. Gaskin, 1991. Organochlorine levels in North Atlantic right whale (*Eubalaena glacialis*) blubber. Arch. Environ. Contam. Toxicol., Vol. 21, pp. 141-145.
- Woodley, T.H. & D.E. Gaskin, 1996. Environmental characteristics of North Atlantic right and fin whale habitat in the lower Bay of Fundy, Canada. Can. J. Zool., Vol. 74, pp. 75-84.
- Worm, B., H.K. Lotze, C. Boström, R. Engkvist, V. Labanauskas & U. Sommer. 1999. Marine diversity shift linked to interactions among grazers, nutrients and dormant propagules. Mar Ecol. Prog. Ser. 185: 309-314.
- Worm B. 2000. Consumer versus resource control in rocky shore food webs: Baltic Sea and northeast Atlantic Ocean. University of Kiel, Germany. Doctoral thesis. 147 p.
- Worm, B., H.L. Lotze & U. Sommer. 2000. Coastal food web structure, carbon storage, and nitrogen retention regulated by consumer pressure and nutrient loading. Limnol. and Oceanogr. 45(2):339-349.
- Worm, B. & H.K. Lotze. 2000. Nutrient pollution, low-trophic level harvesting and cumulative human impact on coastal ecosystems. Gulf of Maine Rockweed: Management in the face of scientific uncertainty. Proceedings of the GPAC workshop., St. Andrews, New Brunswick, Huntsman Marine Science Centre Occasional Report 00/1.
- WWF (World Wildlife Fund) 2001. Working for Wildlife: a quarterly action report published by World Wildlife Fund Canada. Spring 2001.
- Yodzis, P., 2001. Must top predators be culled for the sake of fisheries? Trends Ecol. Evol, Vol. 16, pp. 78-84.
- Zisserson, B. & R. Parker. 1999. Interim report on the sublethal toxicity component of Cycle 2 of The Pulp and Paper Environmental Effects Monitoring Program for the Atlantic Region. Environment Canada, Surveillance Report EPS-5-AR-99-4, Atlantic Region/ Dartmouth, Nova Scotia, 13 p. + 4 appendices.
- Zitko, V. 1971. Polychlorinated biphenyls and organochlorine pesticides in some freshwater and marine fishes. Bull. Environ. Contam. Toxicol. 6: 464-470.

- Zitko, V., B.J. Finlayson, D.J. Wildish, J.M. Anderson & A.C.Kohler. 1971. Methylmercury in freshwater and marine fishes in New Brunswick, in the Bay of Fundy and on the Nova Scotia banks. J. Fish. Res. Board Can. 28: 1285-1291.
- Zitko, V. & P.M.K. Choi. 1971. PCBs and other industrial halogenated hydrocarbons in the environment. Fish. Res. Board Can. Tech. Rep. 272.
- Zitko, V. & W.V. Carson. 1971a. Resin acids and other organic compounds in groundwood and sulfate mill effluents and foams. Fish. Res. Board Can. MS Rep. Biol. Sta. 1134: 25 p.
- Zitko, V. & W.V. Carson. 1971b. Heavy metals in the precipitation in the vicinity of St. Andrews, N.B. Fish. Res. Board Can. Manusc. Rep. Ser. 1129. 9 p.
- Zitko, V. 1975. Chemicals and the aquatic environment. Fish. Res. Board Can. MS Rep. Ser. 1364: 22 p.
- Zitko, V. & R.L. Saunders. 1979. Effect of PCBs and other organochlorine compounds on the hatchability of Atlantic salmon (*Salmo salar*) eggs. Bull. Environ. Contam. Toxicol. 21: 125-130.
- Zitko, V. & D.W. McLeese. 1980. Evaluation of hazards of pesticides used in forest spraying of the aquatic environment. Can. Tech. Rep. Fish. Aquat. Sci. 985, iii + 21 p.
- Zitko, V. 1981. Contaminants in lobsters from an experimental culture facility. Can. Tech. Rep. Fish. Aquat. Sci. 1027, iii + 19 p.
- Zitko, V. 1999. Chemical characterization of the effluent from the Lake Utopia Paper Ltd. pulp mill, and water and sediment from the Upper L'Etang Estuary. Can. Manusc. Rep. Fish. Aquat. Sci. 2498: iii + 14 p.

Guide to Journal Abbreviations

Abbreviation

Full Journal name

Appl. Anim. Behav. Sci.	Applied Animal Behavioral Science
Aquat. Toxicol.	Aquatic Toxicology
Arch. Environ. Contam. Toxicol.	Archives of Environmental Contamination and Toxicology
Ber. Inst. Meereskunde Kiel	Berichte aus dem Institut fuer Meereskunde Kiel
Biol. Bd. Canada, Progr. Rep	Biological Board of Canada, Progress Report
Biol. Conserv.	Biological Conservation
Biol. J. Linn. Soc.	Biological Journal of the Linnean Society
Bot. Mar.	Botanica Marina
Bull. Aquacul. Assoc. Canada	Bulletin of the Aquaculture Association of Canada
Bull. Environ. Contam. Toxicol.	Bulletin of Environmental Contamination and Toxicology
Bull. Eur. Assoc. Fish Path.	Bulletin of the European Association of Fish Pathology
Bull. Fish. Res. Bd. Can.	Bulletin of the Fisheries Research Board Canada
Can. Field Naturalist	Canadian Field Naturalist
Can. Ind. Rep. Fish. Aquat. Sci.	Canadian Industry Reports in Fisheries and Aquatic Science
Can. J. Archaeol	Canadian Journal of Archaeology
Can. J. Fish. Aquat. Sci	Canadian Journal of Fisheries and Aquatic Science
Can. J. Zool	Canadian Journal of Zoology
Can. Manuscr. Rep. Fish. Aquat. Sci	Canadian Manuscript Report in Fisheries and Aquatic Science
Can. Spec. Publ. Fish. Aquat. Sci.	Canadian Special Publication in Fisheries and Aquatic Science
Can. Tech. Rep. Fish. Aquat. Sci.	Canadian Technical Report in Fisheries and Aquatic Science
Can. Zooarchaeol	Canadian Zooarchaeology
Com. Biochem. Physiol.	Comparative Biochemistry and Physiology
Contr. Canad. Biol.	Contributions to Canadian Biology
Contrib. Can. Biol. Fish.	Contributions to Canadian Biology and Fisheries
Crit. Rev. Environ. Control	Critical Review of Environmental Control
CSAS Res. Doc	Canadian Stock Assessment Secretariat Research Document
Dis. Aquat. Org.	Diseases of Aquatic Organisms
Ecol. Appl.	Ecological Applications
Ecol. Econ.	Ecological Economics
Ecol. Monogr.	Ecological Monographs
Ecotoxicol. Environ. Saf.	Ecotoxicology and Environmental Safety
Environ. Biol. Fish.	Environmental Biology of Fishes
Environ. Conserv.	Environmental Conservation
Environ. Health Perspec.	Environmental Health Perspectives
Environ. Pollut.	Environmental Pollution
Environ. Toxicol. Chem.	Environmental Toxicology and Chemistry
Fish. Bull.	Fishery Bulletin
Fish. Res. Bd. Can. Man. Rep. Ser. Biol. Biology	Fisheries Research Board Canada Manuscript Report Series
Fish. Res. Bd. Can. Tech. Rep.	Fisheries Research Board Canada Technical Report
Fish. Res. Bd. Can. Man. Rep. Biol. Stat.	Fisheries Research Board Canada Manuscript Report Biological Station
Fish. Mar. Serv. Tech. Rep.	Fisheries Marine Service Technical Report
Helgol. Meeresunters.	Helgolaender Meeresuntersuchungen
ICES Coop. Res. Rept.	International Council Exploration of the Sea Cooperative Research Report

ICES J. Mar. Sci.	International Council Exploration of the Sea Journal of Marine Science
J. Biol. Bd. Can.	Journal of the Biological Board of Canada
J. Fish Dis.	Journal of Fish Diseases
J. Fish. Res. Bd. Can.	Journal of the Fisheries Research Board Canada
J. Geophys. Res.	Journal of Geophysical Research
J. Great Lakes Res.	Journal of Great Lakes Research
J. Northw. Atl. Fish. Sci.	Journal of Northwest Atlantic Fishery Science
J. Shellfish Res.	Journal of Shellfish Research
J. Wildl. Manag.	Journal of Wildlife Management
J. World Aquacult. Soc.	Journal of the World Aquaculture Society
Limnol. Oceanogr.	Limnology and Oceanography
Mar. Bio. Ann. Rev.	Marine Biology Annual Review
Mar. Biol.	Marine Biology
Mar. Ecol. Prog. Ser.	Marine Ecology Progress Series
Mar. Environ. Res.	Marine Environmental Research
Mar. Mamm. Sci.	Marine Mammal Science
Mar. Poll. Bull.	Marine Pollution Bulletin
N. Am. J. Aquacult.	North American Journal of Aquaculture
Ocean Res.	Ocean Research
Oceanogr. Mar. Biol. Ann. Rev.	Oceanography and Marine Biology Annual Review
Pestic. Monit. J.	Pesticides Monitoring Journal
Proc. Nova Scotian Inst. Sci.	Proceedings of the Nova Scotia Institute of Science
Proc. R. Soc. Lond.	Proceedings of the Royal Society of London
Rep. Int. Whal. Comm.	Report International Whaling Commission
Restorat. Ecol.	Restoration Ecology
Trends Ecol. Evol.	Trends in Ecology and Evolution
U.S. Fish Wildl. Serv. Spec. Sci. Rep. Fish	U.S. Fish and Wildlife Service Special Scientific Report Fisheries
Wilson Bull.	Wilson Bulletin