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Introduction: Living With the Oceans

Humans have been inextricably linked to the oceans throughout recorded history, depending upon them for food, trade, exploration, defence and many aspects of social culture. The seas are of great economic value (e.g. shipping, fisheries, oil and gas, minerals, recreation and tourism), they are vital to the security of coastal states, and they play a major global role in modifying the atmosphere's gases and temperature, thereby influencing climate and weather. The seas are home for most of the known phyla, and many species and ecosystems; they are a unique treasure house of biodiversity (Silcock 1993). The vitality and sustainability of an increasing number of human communities around the globe are dependent on and intertwined with the sea. Nowhere is this more true than in Atlantic Canada, a region intimately tied historically, socially and economically to "things coastal and marine."

The Dorothy J. Killam Memorial Lecture Series of October 1994 was on "Living with the Oceans". This topic was suggested by the University's Oceans Forum, an advisory group to the Dalhousie Ocean Studies Program. It was chosen to heighten awareness of critical issues, amongst the university community and the wider public, and to heighten a commitment to addressing those issues, at a time when ocean resources and ocean health in the Northwest Atlantic are in serious jeopardy and during a year (1994) made historic by the passing into international law of the United Nations Law of the Sea Convention.

We are now in a post-Rio (UNCED) Conference era, with Agenda 21 as a blueprint for action (Tolba 1992). Many problems are recognized and

solutions to them often known, at least in part. Action, however, is too frequently lacking or ineffective. Hence, it is crucial that coastal communities of all sizes and locations revitalize their commitment to understanding, protecting and sustaining the oceans and their life.

Several themes therefore dominated the lectures. There is still much to be learned about oceanic processes and the sustainable management of marine resources. Oceanography and related sciences are relatively young endeavors. The seas and their continental margins are vast, complex, and unpredictable systems, and require skilled long-term investigation because of their role in global functioning. Human populations occupy more and more coastal areas, putting ever increasing pressures (largely land-based) on marine resources, habitats and wildlife. It is clear that ocean management and stewardship involve many players and jurisdictions, often with conflicting agendas and views on resource use (see Lamson 1994). The "Living Oceans", too little understood and under siege as never before, need immediate attention by both politicians and the public.

The Killam lectures addressed the seas in this context. They were presented by three distinguished marine scholars, and were attended by 600-800 people. The speakers had been asked to address questions such as: How well do we understand the ocean environment and oceanic processes? Why is such knowledge so important at this stage of human history? What is the condition of coastal seas? Why are we failing to protect and manage the seas adequately from human impacts? What do we need to do to improve our knowledge and effective management of coastal areas? How can we redefine social priorities for the oceans so as to strengthen scientific, legislative and regulatory initiatives? The debate was meant to inspire the audience to rethink how Canadians should renew their commitment to a unique and vital part of the globe—the living oceans.

Lecture One, "The Oceans: Discovering their Global Roles", was given by Sir Anthony Loughton, past Director of the Institute of Oceanographic Sciences, and a long-time researcher on the geology and geophysics of the ocean basins. Sir Anthony spent many years studying the mid-oceanic ridges. He holds many honours in oceanography, including the Prince Albert 1st of Monaco Gold Medal for Oceanography and the Murchison Medal of the Geological Society of London. He was knighted in 1987 in recognition of his outstanding contributions to oceanography.

The oceans were discussed by Sir Anthony from a global perspective, detailing the geological evolution of the ocean basins, the structure and dynamics of the ocean floor, and characteristics of ocean waters and their life.

Lecture Two, entitled "Our Threatened Oceans", was presented by Dr. Usha Varanasi, a marine environmental chemist and ecotoxicologist. Dr. Varanasi has been Director of the National Oceanic and Atmospheric Administration's National Marine Fisheries Service, Environmental Conservation Division, in Seattle, Washington, since 1987. Her research over the past 20 years has focussed on the bioavailability and metabolism of organic and inorganic contaminants in marine organisms and on understanding the fate and biochemical effects of pollutants in the marine environment. She has recently worked on both the *Exxon Valdez* spill damage assessment and the NOAA's Coastal Ocean Program. She has written many papers and books on these topics, and was the recipient in 1993 of the Department of Commerce's Gold Medal for outstanding leadership on coastal pollution problems in the United States.

The oceans in developed and less-developed areas of the world are already affected or threatened by many chemical contaminants and physical changes, and extensive species reduction or loss. Dr. Varanasi described critical habitats in jeopardy in the USA and major threats to marine resources—overfishing, foreign species, UVb and pollutants. She described how innovative techniques from chemistry to toxicology are being used to describe effects on organisms and ecosystems, to contribute to control strategies, to monitor areas of impact and restoration, and to provide early indications of threats to marine ecosystem health.

Lecture Three, "The Ocean Commons and Community", was given by Professor Bonnie McCay. Professor McCay has a PhD in Anthropology from Columbia University. She has extensively studied coastal fishing communities and their supportive technology and social infrastructure for cooperative fisheries management in the United States, Canada and other countries. She has authored many papers and was elected Fellow of the American Association for the Advancement of Science in 1990 for outstanding contributions in maritime anthropology and the study of ecological and socio-economic change.

The relationships between human communities and management of "the ocean commons" were discussed by Professor McCay. The talk

focussed on fishing, the "fisherman's" problem, and the tragedy of the fishing commons approach.

The Dalhousie oceans community and the public who attended the Lecture Series were greatly enriched by the experiences of the speakers, and stimulated by their knowledge of some of the many issues involved in "Living with the Oceans". I especially thank the speakers for making the 1994 lecture series a success, Professor Eric Mills of the Department of Oceanography as editor for this set of papers, all members of the Killam Ocean Lectures Subcommittee for their many efforts organizing the series, and staff of the University who assisted with logistics of the series. Members of the Dalhousie Oceans Forum are warmly thanked for their suggestions and support. This set of papers in the Dalhousie Review is dedicated to Professor Elizabeth Mann-Borgese of Dalhousie University and the International Oceans Institute, in recognition of her remarkable lifetime commitment to the oceans and to their wise stewardship.

WORKS CITED

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