Lewis S. Incze

Biographical Sketch—October 2012

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Professional Preparation:
Cornell University, B.S., Biology-1976
University of Maine, M.S., Oceanography-1979
University of Washington, Ph.D., Fisheries-1983
Northwest and Alaska Fisheries Science Center/NOAA, Seattle, WA, Postdoctoral Fellowship-1983/84

Appointments:

2011-
School of Marine Sciences, University of Maine: Research Professor; On leave April 2011-present: Program Director, Program in Biological Oceanography, U.S. National Science Foundation, Arlington, VA

2002-2010
University of Southern Maine, Portland, ME: Senior Research Scientist (2002-2006); Member of the Graduate Faculty and Adjunct Professor of Biology (2003-2010); Research Professor, Department of Environmental Science and Director, Aquatic Systems Group (2006- 2010);

University of Maine, Orono, ME: Member of the Graduate Faculty; Adjunct Professor of Marine Science (2003- 2010)

Adjunct Senior Scientist, Bigelow Laboratory for Ocean Sciences, West Boothbay Harbor, ME (2010-)

1987-2002
Bigelow Laboratory for Ocean Sciences, West Boothbay Harbor, ME: Scientist (1987-1991), Director and Chief Executive Officer (1991-1995); Senior Scientist (1991-2002)

1984-1987
Pacific Marine Environmental Laboratory (NOAA) and Northwest and Alaska Fisheries Science Center (NOAA), Seattle, WA: Scientist and Principal Project Investigator

Research & Professional Interests: Oceanography and marine ecology; coupling of physical and biological processes in marine populations; biodiversity, conservation, and ecosystem functioning; ocean observing; climate change; ocean and marine resource management; science, society and policy

Professional Societies:

American Assoc. for the Advancement of Science
American Geophysical Union
Ecological Society of America
Society for Limnology and Oceanography
The Oceanography Society

Summary of Research Grants since 2002-2011 (time of leave)

Submitted: 28 grant applications totaling $8,690,977
Funded: 17 awards totaling $5,052,498
Sources: NSF, ONR, NOAA (Coastal Ocean Program, Fisheries, Sea Grant, Northeast Consortium), Alfred P. Sloan Foundation, Davis Foundation

Recent Awards (Agency, Duration, Role and Titles):

U.S. National Science Foundation-Dynamics of Coupled Natural and Human Systems (2006-2011). Co-PI. Collaborative research: Direct and indirect coupling of fisheries through economic, regulatory, environmental and ecological linkages

U.S. Office of Naval Research (2007-2010). Lead PI. Energy transfer to upper trophic levels on a small offshore bank.

Alfred P. Sloan Foundation (2007-2010, continuation grant). Lead PI. Synthesis: Gulf of Maine Area Program, Census of Marine Life.

Recent Collaborations:

NOAA-IOOS: A mobile bentho-pelagic observatory to support fisheries and ecosystem management (PI: Scott Gallager, WHOI, 2007-2010).

Alfred P. Sloan Foundation: A meta-analysis of biophysical relationships between seabed species/assemblages and their environment [PIs: R. Pitcher (CSIRO) and P. Lawton (DFO-Canada), 2009-2010].

Refereed Publications:

Jordaan, A, MG Frisk, **LS Incze**, NH Wolff, L Hamlin, Y Chen. In press. Multivariate dissemination of species relationships for use in marine spatial planning. Can. J. Fish. Aquat. Sci.

Lawton, P, LS **Incze**, SL Ellis. 2012. Representation of biodiversity knowledge within ecosystem-based management approaches for the Gulf of Maine. Trans. Amer. Fish. Soc.

Pitcher CR, P Lawton, N Ellis, SJ Smith, **LS Incze**, C-L Wei, ME Greenlaw, NH Wolff, JA Sameoto, PVR Snelgrove. 2012. Exploring the role of environmental variables in shaping patterns of seabed biodiversity composition in regional-scale ecosystems. Journal of Applied Ecology 2012, 49, 670–679.

Ellis, SL, **LS Incze**, P Lawton, H Ojaveer, BR MacKenzie, CR Pitcher, TC Shirley, M Eero, JW Tunnell Jr., PJ Doherty, BM Zeller. 2011. Four regional marine biodiversity studies: Approaches and contributions to Ecosystem-Based Management. PLoS ONE 6(4)18997.doi:10.1371/ journal.pone.0018997.

Johnson, CL, JA Runge, KA Curtis, EG Durbin, JA Hare, **LS Incze**, J Link, GD Marvin, TD O'Brien, LV Guelpen. 2011. Biodiversity and ecosystem function in the Gulf of Maine: Pattern and role of zooplankton and pelagic nekton. PLoS ONE

Li, WKW, RA Andersen, DJ Gifford, **LS Incze**, JL Martin, CH Pilskaln, JN Rooney-Varga, ME Sieracki, WH Wilson, NH Wolff. 2011. Planktonic microbes in the Gulf of Maine area. PLoS ONE 6(6): e20981. doi:10.1371/journal.pone.0020981

Incze, LS, P Lawton, SL Ellis and NH Wolff. 2011. Biodiversity knowledge and its application in the Gulf of Maine Area. Chapter 3 In: (McIntyre, Ed.) *Marine Life: Diversity, Abundance and Distribution,* Wiley-Blackwell.

Fautin, D., P. Dalton, L. S. **Incze**, J-A. C. Leong, C. Pautzke, A. Rosenberg, P. Sandifer, G. Sedberry, J.W. Tunnell, Jr., I. Abbott, R. E. Brainard, M.Brodeur, L. G. Eldredge, M. Feldman, P. S. Vroom, M. Wainstein, N.Wolff. 2011. An overview of marine biodiversity in United States waters. *PloS-One*.

Incze, LS, H Xue, N Wolff, D Xu, C Wilson, R Steneck, R Wahle, P Lawton, N Pettigrew, Y Chen. 2010. Connectivity of lobster populations in the Gulf of Maine. Part II. Coupled biophysical dynamics. Fish. Oceanogr. 19: 1-20.

Wahle, RA, JS Cobb, **LS Incze**, P Lawton, M Gibson, R Glenn, C Wilson, J Tremblay. 2010. The American loster settlement index at 20 years: looking back—looking forward. J. Mar. Biol. Assoc. India 52: 180-188.

Palumbi, SR, PA Sandifer, JD Allan, MW Beck, DG Fautin, MJ Fogarty, BS Halpern, **LS Incze,** J-A Leong, E Norse, JJ Stachowitcz, DH Wall. 2009. Managing for ocean biodiversity to sustain marine ecosystem services. Frontiers Ecol. Environment 7, doi: 10.1890/070135

Manning, JP, DJ McGillicuddy Jr., NR Pettigrew, JH Churchill, LS **Incze**. 2009. Drifter observations of the Gulf of Maine Coastal Current. Cont. Shelf Res. 29: 835-845.

Xue, H, LS **Incze**, D Xu, N Wolff, N Pettigrew. 2008. Connectivity of lobster

populations in the coastal Gulf of Maine. Part I: Circulation and larval transport potential. Ecol. Model. 210: 193-211.

Stevick, PT, LS **Incze**, SD Kraus, S Rosen, N Wolff, A Baukus. 2008. Trophic relationships and oceanography on and around a small offshore bank. Mar. Ecol. Progr. Ser. 363:15-28.

Fogarty, MJ, LS **Incze**, K Hayhoe, D Mountain, J Manning. 2008. Potential climate change impacts on Atlantic cod (*Gadus morhua*) off the northeastern USA. Mitig. Adapt. Strat. Global Change. 13:453-466.

Annis, ER, LS **Incze**, N Wolff, RS Steneck. 2007. Estimates of *in situ* larval development time for the lobster, *Homarus americanus*. J. Crust. Biol. 27: 454-462.

Incze, LS, RA Wahle, N Wolff, C Wilson, R Steneck, E Annis, P Lawton, H Xue and Y Chen. 2007. Early life history and a modeling framework for lobster populations in the Gulf of Maine. J. Crustacean Biol.

Lough, RG, EA Broughton, LJ Buckley, LS **Incze,** K Pehrson Edwards, R Converse, A Aretxabaleta, FE Werner. 2006. Modeling growth of Atlantic cod larvae on the southern flank of Georges Bank in the tidal-front circulation during May 1999. Deep-Sea Res. II. 53: 2771-2788

Wahle, RA, LS **Incze** and MJ Fogarty. 2004. First projections of American lobster recruitment using a settlement index. Bull. Mar. Sci. 74: 101-114.

National Research Council. 2004. Atlantic Salmon in Maine. National Academy Press,Washington, D.C. 275 p. (one of 13 co-authors)

Incze, LS, N.Wolff and R Wahle. 2003. Can scientific observations of early life stages be scaled up to the level of a fished population? A case study using *Homarus americanus*. Fish. Res. 65: 33-46.

National Research Council. 2002. Genetic Status of Atlantic Salmon in Maine. National Academy Press, Washington, D.C. 62 p. (one of 13 co-authors)

Incze, LS, D Hebert, N Wolff, N Oakey, D Dye. 2001. Changes in copepod distributions associated with increased turbulence from wind stress. Mar. Ecol. Progr. Ser. 213: 229-240.

Incze, LS, RA Wahle, AT Palma. 2000. Advection and settlement rates in a benthic invertebrate: Recruitment to first benthic stage in *Homarus americanus*. ICES J. Mar. Sci. 57: 430-437.

Incze, LS and CE Naimie. 2000. Modeling the transport of lobster (*Homarus americanus*) larvae and postlarvae in the Gulf of Maine. Fish. Oceanogr. 9: 99-113.

Incze, LS, P Aas, T Ainaire and M Bowen. 2000. Neustonic postlarval lobsters, *Homarus americanus*, in the western Gulf of Maine: Spatial and interannual variations. Can. J. Fish. Aquat. Sci. 57: 1-11.

Incze, LS and KM Bailey. 1998. Oceanography and localized fishery stocks: Possible mechanisms. Pp. 31-37 In: The Implications of Localized Fishery Stocks (H. von Herbing, I. Kornfield, M. Tupper and J. Wilson, eds.). Natural Resources, Agriculture and Engineering Service, Cornell University, Ithaca, NY, 200 p.

Incze, LS, RA Wahle and SJ Cobb. 1997. Quantitative relationships between postlarval production and benthic recruitment in lobsters, *Homarus americanus*. J. Freshwater Mar. Sci. 48: 729-743.

Wahle, RA and LS **Incze**. 1997. Pre- and post-settlement processes in recruitment of the American lobster, *Homarus americanus*. J. Exp. Mar. Biol. Ecol. 217: 179-207.

Incze, LS, DW Siefert and JM Napp. 1997. Mesozooplankton of the Alaska Coastal Current: Abundance and community composition. Cont. Shelf Res. 17: 287-305.

Incze, LS, P Aas and T Ainaire. 1996. Distributions of copepod nauplii and turbulence on the southern flank of Georges Bank: Implications for feeding by larval cod (*Gadus morhua*). Deep-Sea Res. II, 43: 1855-1873.

Napp, JM, LS **Incze**, PB Ortner, DL Siefert and L Britt. 1996. The plankton of Shelikof Strait, Alaska: Standing stock, production, mesoscale variability and their relevance to larval fih survival. Fish. Oceanogr. 5: 19-38.

Incze, LS and T Ainaire. 1994. Distribution and abundance of copepod naupolii and other small (40-300 μm) zooplankton during spring in Shelikof Strait, Alaska. Fish. Bull. 92: 67-78.

Kendall, AW Jr., LS **Incze**, PB Ortner, S Cummings, and PK Brown. 1994. Vertical distribution of walleye Pollock (*Theragra chalcogramma*) eggs and larvae in Shelikof Strait, Alaska. Fish. Bull. 92: 540-554.

Vastano, AC, LS **Incze**, and JD Schumacher. 1992. Observation and analysis of fishery proceses: Larval Pollock at Shelikof Strait, Alaska. Fish. Oceanogr. 1: 20-30.

Incze, LS and RA Wahle. 1991. Recruitment from pelagic to early benthic phase in lobsters *Homarus americanus*. Mar. Ecol. Progr. Ser. 79: 77-87.

Canino, MF, KM Bailey, and LS **Incze**. 1991. Temporal and geographic differences in feeding and nutritional condition of larval walleye Pollock, *Theragra chalcogramma*, in Shelikof Strait, Alaska. Mar. Ecol. Progr. Ser. 79: 27-35.

Incze, LS, PB Ortner and JD Schumacher. 1990. Microzooplankton, vertical mixing and advection in a larval fish patch. J. Plankton Res. 12: 365-379.

Reed, RK, LS **Incze**, and JD Schumacher. 1989. Estimation of the effects of flow on dispersion of larval Pollock (*Theragra chalcogramma*) in Shelikof Strait, Alaska. In: Effects of Ocean variability on Recruitment and an Evaluation of Parameters Used in Stock Assessment Models (RJ Beamish and GA McFarlane, Eds.). Can. Spec. Publ. Fish. Aquat. Sci. 108: 239-246.

Incze, LS, AW Kendall, Jr., JD Schumacher and RK Reed. 1989. Interactions of a mesoscale patch of larval fish (*Theragra chalcograma*) with the Alaska Coastal Current. Cont. Shelf Res. 9: 269-284.

Reed, RK, JD Schumacher and LS **Incze**. 1987. Circulation in Shelikof Strait, Alaska. J. Phys. Oceanogr. 17: 1546-1554.

Incze, LS, DA Armstrong and SL Smith. 1987. Abundance of larval Tanner crabs

(*Chionoecetes* spp.) in relation to adult females and regional oceanography of the Southeastern Bering Sea. Can. J. Fish. Aquat. Sci. 44: 1143-1156.

Bailey, KM and LS **Incze**. 1985. El Niño and the early life history of recruitment of fishes in temperate marine waters. Pp. 143-165 In: El Niño North (WS Wooster and DL Fluharty, Eds.). Washington Sea Grant, Univ. Washington, Seattle

Incze, LS, DL Wencker and DA Armstrong. 1984. Growth and average growth rates of Tanner crab zoeae collected from the plankton. Mar. Biol. 84: 93-100.

Incze, LS and AJ Paul. 1983. Grazing and predation as related to energy needs of Stage I zoeae of the Tanner crab *Chionoecetes bairdi* (Brachyura, Majidae). Biol. Bull. 165: 197-208.

Incze, LS, DA Armstrong and DL Wencker. 1983. Rates of development and growth of larvae of *Chionoecetes bairdi* and *C. opilio* in the Southeastern Bering Sea. Pp. 191-218 In: International Symposium on the Genus *Chionoecetes*. 792 p. Alaska Sea Grant Rep. 82-10, Univ. Alaska, Fairbanks.

Wencker, DL, LS **Incze** and DA Armstrong. 1983. Distinguishing between *Chionoecetes bairdi* and *C. opilio* zoeae collected in the southeastern Bering Sea. Pp. 219-230 In: International Symposium on the Genus *Chionoecetes*. 792 p. Alaska Sea Grant Rep. 82-10, Univ. Alaska, Fairbanks.

Incze, LS, LM Mayer, EB Sherr and SA Macko. 1982. Carbon inputs to bivalve mollusks: A comparison of two estuaries. Can. J. Fish. Aquat. Sc. 39: 1348-1352.

Incze, LS, RA Lutz and E True. 1981. Modeling carrying capacities for bivalve molluscs in open, suspended-culture systems. J. World Mar. Soc. 12: 141-155.

Incze, LS and CM Yentsch. 1981. Stable density fronts and dinoflagellate patches in a tidal estuary. Estuarine Coastal Shelf Sci. 13: 547-556.

Incze, LS, R Lutz and L Watling. 1980. Relationships between effects of environmental temperature and seston on growth and mortality of *Mytilus edulis* in a temperate northern estuary. Mar. Biol. 57: 147-156.

Incze, LS and RA Lutz. 1980. Mussel Culture: An East Coast Perspective. Pp. 99-140 In: Mussel Culture and Harvest: A North American Perspective (RA Lutz, Ed.). Elsevier, New York

Yentsch, CM and LS **Incze**. 1980. Accumulation of algal biotoxins in mussels. Pp. 223-246 In: Mussel Culture and Harvest: A North American Perspective (RA Lutz, Ed.). Elsevier, New York

In revision:

Incze, LS, NH Wolff, J Lerzak, S Kraus, A Bauckus, S Rosen, DM Fields. Euphausiid patches and surface feeding by humpback whales: Responses to internal waves over a submarine bank. For *Mar. Ecol. Progr. Ser.*

In Preparation:

Incze, L.S., N. Wolff, P. Lawton, S. Ellis. A Census of Marine Life for the Gulf of Maine Area. For *PLoS-One*

Published Reports, since 2002:

2009 Maine's Climate Future: An Initial Assessment (Jacobson, GL, IJ Fernandez, PA Mayewski, CV Schmitt, Eds.). Contributing author, Chapter III, The Meaning of a Changed Environment: Intitial Assessment of Climate Change in Maine (sections on "Gulf of Maine" and "Biodiversity") University of Maine, Orono, ME. 70 p. *www.climatechange.umaine.edu/mainesclimatefuture*

2007 Confronting Climate Change in the U.S. Northeast: Science, Impacts and Solutions. Contributing author and co-lead of the marine section. Union of Concerned Scientists, Cambridge MA 146 p. *www.northeastclimateimpacts.org*

Courses Taught/Co-Taught, Since 2002:
Biodiversity and Conservation (300 level)
Earth Systems and Climate Change (300 level)
Biology/Special Topics (400 level)
Fisheries Oceanography (500 level, co-taught)

Student Advising/Internships, Since 2002:
Advisory: 1 Ph.D., 4 M.S.
Internships/Training: 4 M.S. (in addition to 4 M.S. listed above), 1 pre-doc, 13 undergraduates, 2 High School Science teachers

Talks and Presentations (2007-present):

1. University of Maryland, Horn Point Laboratory, Cambridge, MD, May 2012—invited talk: Internal waves generate a feeding hotspot over a small bank.
2. Old Dominion University, Dept. of Biology, Norfolk, VA, October 2011—2 invited talks: Departmental Seminar and Graduate Program Seminar
3. World Conference on Marine Biodiversity, Aberdeen, Scotland—2 contributed talks (1 as lead, 1 as co-author)
4. International Lobster Symposium, Goa, India, January 2010—contributed talk (as co-author)
5. Ocean Sciences Meeting, Portland, OR, February 2010—1 Contributed talk and 2 contributed posters (co-author on all three)
6. ICES Working Group on Zooplankton Ecology, Portland, ME, Mar 2010—Invited talk

7. Atlantic Salmon in the Gulf of Maine (NOAA & Maine Sea Grant), Portland, ME. Jan 27-28, 2009—Invited talk
8. Census of Marine Life, Long Beach, CA, Feb 1-5, 2009—Invited
9. Invited Lecture in Biological Oceanography, Univ. New Hampshire, Durham, NH. April, 2009
10. Sea Grant-Regional Priorities, Univ. of New Hampshire, Durham, NH. June 10- 11, 2009—Invited group leader
11. Lobster Settlement Workshop—20 Years Later. Boothbay Harbor, ME. June 19- 21, 2009—Invited plenary talk
12. Gulf of Maine Science Symposium, St. Andrews, NB, CA. Oct 4-9, 2009—Steering Committee, Plenary talk, and Technical Workshop leader
13. Biological Ocean Observing, Washington, D.C., Jan 08, 2008—Invited
14. AAAS, Annual Meeting, Boston, MA, Feb 08, 2008—2 Invited talks and 2 panel discussions
15. Invited Lecture in Oceanography, Univ. Maine School of Marine Sciences, Orono, ME, Feb 2008
16. AGU-ASLO-TOS Ocean Sciences, Biennial Science Meeting, Orlando, FL, Mar 2008—Invited talk
17. NSF-GLOBEC Scientific Steering Committee-Portland, ME, May 2008—Invited talk
18. Ecosystem Comparisons, Corpus Christi, TX, June 2008—Workshop organizer
19. Gulf of Maine Habitat Classification Workshop, Portsmouth, NH, Sep 2008—Invited
20. U.S. National Committee for the Census of Marine Life, Monterey, CA, Sep 2008—Invited
21. Meta-Analysis of Biophysical Relationships, Workshop, Halifax, NS, Oct 2008—Invited
22. U.S. Office of Naval Research, Marine Mammal Program Review, Woods Hole, MA, Oct 2008—Invited talk
23. World Marine Biodiversity Conference, Valencia, ES, Nov 2008—Contributed poster
24. Ocean Sciences Meeting, Santa Fe, NM., February 2007—Contributed poster
25. Discovery Corridor, St. Andrews, NB. February 2007—Invited talk
26. Climate Change Conference, USM Law Colloqium and Gulf Maine Res. Inst., Portland, ME. May 2007—Invited talk
27. NOAA Ocean Exploration Program, Wash., D.C., May 2007—Invited talk
28. National Marine Educators' Association, Portland, ME. July 2007—Invited talk
29. International Council for the Exploration of the Sea, Helsinki, FD. Sep 2007—Contributed talk
30. NOAA General Council's Office, Sep 2007—Invited talk
31. International Ocean Biodiversity Informatics Conference, Halifax, NS, CA. Oct 2007—Contributed talk (co-author) and 2 posters (posters with graduate and undergraduate students)
32. Office of Naval Research, Acoustics Program Review and Planning, Woods Hole, MA Nov 2007—Invited
33. Census of Marine Life, Auckland, NZ. Nov 2007—Invited
34. Marine Mammal Society, Durbin, SA, Dec 2007—Contributed talk (co-author)

Reviewing (since 2000):

<u>Agencies and Programs</u> (*ad hoc* mail reviews unless specified otherwise):
National Science Foundation (Biology, Polar Programs, International Programs, GLOBEC)
National Science Foundation Panels—2
NOAA (NEC, CSCOR, Sea Grant, NMFS)
Danish Science Foundation

Australian CSIRO
Sea Grant Programs: Delaware, Maine, Maryland, Massachusetts, California, Washington

Journals:
Marine Ecology Progress Series
Marine Biology
Limnology and Oceanography
Bulletin of Marine Science
Journal of Crustacean Biology
Progress in Oceanography
Fisheries Oceanography
Canadian Journal of Fisheries and Aquatic Sciences
Journal of Plankton Research
Journal Marine Research
Continental Shelf Research
Deep-Sea Research
Fisheries Research
Fish Bulletin
ICES Journal of Marine Research

Advisories (Major programs only, since 2002):

Gulf of Maine Ocean Observing System
Northeast Assoc. Coastal Ocean Observing Systems
Northeast Coastal and Ocean Data Partnership
Stellwagen Bank National Marine Sanctuary-Zoning Working Group
U.S.-Canada Joint Ecosystem Assessment-Gulf of Maine
U.S. National Committee on the Census of Marine Life
Massachusetts Ocean Partnership
U.S. National Research Council, Member: Committee on Salmon in Maine
U.S. National Research Council—Program Review: Central Alaska (Yukon-Kuskokwim) Salmon Investigation and Recovery Plans
UK: Integrated Assessments of the North Sea (External Evaluation and Advisory Team)

Synergistic Activities:

- Strong involvement (25 years) in education, advising and service to the public, fishing industry and resource/environmental managers. Topics included marine resource natural processes, marine resource management, anthropogenic influences on marine resources and the environment, and climate change assessment
- Strong involvement with designing and implementing integrated, interdisciplinary and comprehensive data approaches to regional ocean observing
- Founding Chair (1991-92), Regional Association for Research in the Gulf of Maine (RARGOM); repeated service as Chair (1998-2000); member (1991-present)
- Zoning Working Group, Stellwagen Bank National Marine Sanctuary

- Served as Program Director in Biological Oceanography at the US National Science Foundation, and during this time served as a Program Director on the Dimensions of Biodiversity program, as Chair of the Working Group for developing a solicitation in Coastal Sustainability, and as Leader of the Management Team for that solicitation once it was issued.