

David Scheel

Professor of Marine Biology
Environmental Science Department
Alaska Pacific University

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Education

Ph.D. 1992, M.S. 1986, Ecology, University of Minnesota, Minneapolis, M.N.

Ph.D. thesis title: *Foraging behavior and predator avoidance: Lions and their prey in the Serengeti*. Thesis Professor: Dr. Craig Packer.

B.S. 1984 cum laude, Biology (Experimental Psychology minor)
Rensselaer Polytechnic Institute, Troy, N.Y.

Professional Appointments

2000-present - **Professor of Marine Biology**, Marine Biology Program Director (through 2013)
Alaska Pacific University, Anchorage, AK.

1999 to 2003 - **Affiliate Scientist**

1993 to 1999 - **Associate Scientist**

Prince William Sound Science Center, working on marine conservation and the ecology of marine predators.

1995 to 2000 **Affiliate Assistant Professor**

University of Alaska Fairbanks

1999-2000 - **Visiting Assistant Professor**, Carroll College, Waukesha, WI. (I taught *Conservation & Environmental Improvement* and *Geographic Information Systems*).

Spring 1998-1999 - **Instructor**, St. Lawrence University, Canton N.Y.

(I taught *Behavioral Ecology* and *Philosophy of Evolution*)

Fall 1995 - **Instructor**, Prince William Sound Community College

(I taught *Using Geographic Information Systems for Ecological Research*)

1992-1993 - **Post-doctoral Associate**, University of Houston. *Impact of global environmental change on biodiversity of mammals in the southcentral United States*. Post-doctoral Professor: Dr. Guy Cameron.

1985 to 1992 - **Research Scientist**, Serengeti Wildlife Research Institute, Tanzania, working with Drs. Craig Packer & Anne Pusey on the ecology and conservation of African lions.

1984 to 1992 - **Teaching Assistant, Teaching Specialist**, and graduate student, University of Minnesota. (I taught nine different courses in the Ecology and Biology departments.)

Grants and Fellowships

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|------------------|---|--|
| 2016 | Student aquarium research: the science and technology of artificial ecosystems and captive marine animal life support | Alaska Space Grant Program, NASA |
| 2000-2016 | Behavior & Benthic Ecology of Octopuses in Alaska | Pollock Conservation Consortium |
| 2010 | Using remote sensing to assess behavioral responses to fishing in octopuses. | West Coast & Polar National Undersea Research Program, NOAA |
| 2008, 2009, 2010 | Behavior of free-roaming Giant Pacific Octopus <i>Enteroctopus dofleini</i> in Prince William Sound | Alaska Space Grant Program, NASA |
| 2008, 2009 | Ford Foundation Encountering Controversies/Difficult Dialogs Fellowship | Alaska Pacific University |
| 2006 | Octopus tagging study in south-central Alaska: movement rates. | Alaska Fisheries Development Foundation |
| 2005 | Denning and habitat ecology of the Giant Pacific Octopus | Expeditions Council of the National Geographic Society |
| 2001-2004 | Development of an autonomous underwater vehicle for behavioral studies of octopus and other marine animals by video technique | National Science Foundation OCE - Major Research Instrumentation |
| 1999 | Alaska Oceans Unified Research Plan | By contract with the Alaska Oceans Seas Fisheries Research Foundation |
| 1998 | Energy content of foods in the diet of the Giant Octopus | Merck Research Program (Student Research at the Interface of Biology and Chemistry), St. Lawrence University |
| 1998 | What is the significance of depth in the ecology of <i>Octopus dofleini</i> ? | West Coast & Polar National Undersea Research Program, NOAA |
| 1995-1998 | Long-term Killer Whale Database | North Gulf Oceanic Society, supported by Exxon Valdez Oil Spill (EVOS) Trustee Council |
| 1994-1998 | Site specific Habitat and Biological Data for the proposed Shepard Point Road and Deep-water Port | City of Cordova/Alaska Department of Transportation |
| 1995-1996, 1998 | Predation by seabirds on hatchery-released salmon fry | Alaska Department of Fish & Game/EVOS Trustee Council |
| 1995-1997 | Survey of octopuses & their habitats | USFS/EVOS Trustee Council |
| 1995 | Equipment grant for underwater photography | PADI Project Aware |
| 1994-1995 | Co-author, Editor, Co-PI for Sound Ecosystem Assessment, EVOS restoration (program annual budget, ~\$4,500,000). | Alaska Department of Fish & Game/EVOS Trustee Council |
| 1984-1985, 1989 | Graduate School Fellowship | University of Minnesota |
| 1985, 1986 | Lions and their prey in the Serengeti. Dayton Natural History Fellowships | Bell Museum of Natural History, University of Minnesota |

Dive Certification

I am a Scientific Diver meeting AAUS (Association for Advancement of Underwater Science) guidelines. I am a PADI-certified Dive Master and am certified as a Scientific Diver to 100 feet. I have logged over 400 scientific and training SCUBA dives (most in cold water and low visibility), and 16 submersible dives to as deep as 200 m in the research submersible *Delta*.

2000-present Dive Control Board member, Alaska Pacific University

2009-present Dive Control Board member, Alaska SeaLife Center

Publications (APU student names in **bold**.)

1. **Hollenbeck, N.**, M. Fowler, D. Scheel, G.K. Sage, **R.K. Toussaint**, C. Talbot. *In submission*, Apr 2016. Use Of swabs for sampling epithelial cells for molecular genetics analyses in *Enteroctopus*. *American Malacological Bulletin*.
2. **Hollenbeck, N.**, D. Scheel. *In submission*, Apr 2016. Body patterns of a new octopus from Prince William Sound, AK. *American Malacological Bulletin*.
3. Scheel, D. *In submission*, Apr 2016. Sea-surface temperatures predict targeted visual surveys of octopus abundance. Proceedings of the 30th Lowell Wakefield Fisheries Symposium: Tools and Strategies for Assessment and Management of Data-Limited Fish Stocks, Anchorage AK May 2015.
4. Scheel, D., T. Leite, J. Mather, K. Langford,. *In press, Oct 2016*. Diversity in the diet of the predator *Octopus cyanea* in the coral reef system of Moorea, French Polynesia. *Journal of Natural History*.
5. Scheel, D., P. Godfrey-Smith, M. Lawrence. 2016. Signal use by octopuses in agonistic interactions. *Current Biology* 26. <http://dx.doi.org/10.1016/j.cub.2015.12.033>
6. Scheel, D. 2015. Sea-surface temperature used to predict the relative density of giant Pacific octopuses (*Enteroctopus dofleini*) in intertidal habitats of Prince William Sound, Alaska. *Marine and Freshwater Research* 66:866-876.
7. Scheel, D., P. Godfrey-Smith, M. Lawrence. 2014. *Octopus tetricus* (Mollusca: Cephalopoda) as an ecosystem engineer. *Scientia Marina* 78(4).
8. Mather, J., D. Scheel. 2014. Chapter 2: Behavior, pp. 17-39 in Cephalopod Culture. J. Iglesias, L. Fuentes & R. Villanueva (Eds.) Springer Netherlands. 494 p.
9. (*Extended abstract*) Scheel D. 2014. Anesthesia, Movements and Recruitment of Giant Pacific Octopuses in Relation to Temperature: Abstracts of the first Giant Pacific Octopus (*Enteroctopus dofleini*) workshop. *Drum and Croaker*.45:109-111.
10. **Hollenbeck, N.**, D. Scheel. 2012. Is there a previously unknown cryptic species of giant Pacific octopus in Prince William Sound, Alaska? *American Malacological Society Newsletter* Fall 2012, 43(2): 7-9.
11. Scheel, D, R. Anderson. 2012. Variability in the regional diet specialization of *Enteroctopus dofleini* in the eastern Pacific examined from midden contents. *American Malacological Bulletin* 30(2): 267-279.
12. Scheel, D, **L. Bisson**. 2012. Movement patterns of giant Pacific octopuses, *Enteroctopus dofleini* (Wülker, 1910). *Journal of Experimental Marine Biology & Ecology* 416-417: 21-31.

13. **Toussaint, R K**, D Scheel, G K Sage, S L Talbot. 2012. Nuclear and mitochondrial markers reveal evidence for genetically segregated cryptic speciation in giant Pacific octopuses from Prince William Sound, Alaska. *Conservation Genetics*: 13(6): 1483-1497.
14. **Toussaint, R K**, G K Sage, S L Talbot, D Scheel. 2012. Microsatellite marker isolation and development for the giant Pacific octopus (*Enteroctopus dofleini*). *Conservation Genetics Resources* 4(3): 545-548.
15. Scheel, D., Vincent, T.L. 2009. Life: Optimal, evolutionary and intelligent design? *Evolutionary Ecology Research* 11:589-610.
16. Barry, P, R Brewer, J Browning, **J Grund**, D Scheel, D Tallmon & S Tamone. 2007. Investigation of tagging methods and tracking for Giant Pacific Octopus (*Enteroctopus dofleini*) in Southcentral Alaska. *Final Report to NMFS*. Alaska Fisheries Development Center, available on-line at www.afdf.org/past_research/investigation_tagging_octo.pdf
17. Scheel, D., **Lauster, A.**, Vincent, T.L.S. 2007. Habitat ecology of *Enteroctopus dofleini* in Prince William Sound, Alaska. Ch 20 in N.H. Landman et al (eds). *Cephalopods Present and Past: New Insights and Fresh Perspectives*, pages 434-458. Springer.
18. Scheel, D. 2002. Characteristics of habitats used by *Enteroctopus dofleini* in Prince William Sound and Cook Inlet, Alaska. *P.S.Z.N. Marine Ecology* 23(3):185-206.
19. Cooney, R. T., J. R. Allen, M. A. Bishop, D. L. Eschlinger, T. Kline, B. Norcross, C. P. McRoy, J. Milton, J. Olson, V. Patrick, A. J. Paul, D. Salmon, D. Scheel, G. L. Thomas, S. L. Vaughan, T. M. Willette. 2001. Ecosystem controls of pink salmon (*Oncorhynchus gorbuscha*) and Pacific herring (*Clupea pallasii*) populations in Prince William Sound, Alaska. *Fisheries Oceanography* 10(Suppl. 1): 1-13.
20. Willette, T.M., R. T. Cooney, V. Patrick, D. M. Mason, G. L. Thomas, D. Scheel. 2001. Ecological processes influencing mortality of juvenile pink salmon (*Oncorhynchus gorbuscha*) in Prince William Sound, Alaska. *Fisheries Oceanography* 10(Suppl. 1): 14-41.
21. Scheel, D., C. Matkin, E. Saulitis. 2001. Distribution of killer whale pods in Prince William Sound, Alaska 1984-1996. *Marine Mammal Science*, 17(3):555-569.
22. Cameron, G. N., and D. Scheel. 2001. Getting warmer: effect of global climate change on distribution of rodents in Texas. *Journal of Mammalogy* 82(3):652-680.
23. Dodge, R., Scheel, D. 1999. Remains of the prey: recognizing the middens of *Octopus dofleini*. *The Veliger*, 42(3):260-266.
24. Vincent, T.L.S., D. Scheel, K. Hough. 1998. Some aspects of diet and foraging behavior of *Octopus dofleini* in its northernmost range. *Marine Ecology* 19(1):13-29.
25. Scheel, D., K.R. Hough. 1997. Seabird predation on salmon fry near an Alaskan hatchery. *Marine Ecological Progress Series* 150(1-3):35-48.
26. Cameron, G.N., J.O. Seamon, D. Scheel. 1997. Environmental change and mammalian richness: Impact on preserve design and management in east Texas. *Texas Journal of Science* 49(3) Supplement:155-180.
27. Vincent, T.L.S., D. Scheel, J. Brown, T.L. Vincent. 1996. Tradeoffs and coexistence in consumer-resource models: It all depends on what and where you eat. *American Naturalist* 148(6): 1038-1058.

28. Scheel, D., T.L.S. Vincent, G.N. Cameron. 1996. Global warming and the species richness of bats in Texas. *Conservation Biology* 10(2):452-464.
29. Scheel, D., C. Packer. 1995. Variation in predation by lions: Tracking a moveable feast. pp 299-314 in: Serengeti II: Research, Management and Conservation of an Ecosystem. Sinclair, A.R.E. & Arcese, P., eds. Chicago: University of Chicago Press.
30. Cameron, G.N., D. Scheel. 1993. A GIS model of the effects of global climate change on mammals. *Geocarto International* 4:19-32.
31. Scheel, D. 1993. Watching for lions in the grass: The usefulness of scanning and its effects during hunts. *Animal Behavior*. 46(4):695-704.
32. Scheel, D. 1993. Profitability, encounter rates and the prey choice of African lions. *Behavioral Ecology* 4(1):90-97.
33. Scheel, D., C. Packer. 1991. Group hunting behavior of lions: a search for cooperation. *Animal Behavior* 41(4):697-709.
34. Packer, C., D. Scheel, A.E. Pusey. 1990. Why lions form groups: Food is not enough. *American Naturalist* 136:1-19.
35. Scheel, D. 1985. Road salt contaminates well, causes health hazards. *J. of Environmental Health* 47(4):202-203.

Professional presentations (APU student names in **bold**.)

- Scheel, D., T. Leite, J. Mather. 2016. Diversity in the diet of the predator *Octopus cyanea* in the coral reef system of Moorea, French Polynesia. Animal Behavior Society Columbia MO 30 Jul-6 Aug 2016.
- Voss, K.**, D. Scheel. Behavior and personality of giant Pacific octopus (*Enteroctopus dofleini*) in simulated social contexts. Cephalopod International Advisory Council Nov 2015 Hokodate Japan.
- Mather, J., T. Leite, D. Scheel. 2015. Influences on prey choice of *Octopus cyanea* in Moorea, French Polynesia. Cephalopod International Advisory Council Nov 2015 Hokodate Japan.
- D. Scheel, **C. Marsteller**, T.L. Vincent. 2015. Can sea-surface temperatures predict targeted visual surveys of octopus and crab abundance? Invited speaker, American Fisheries Society – Alaska Chapter. Homer AK, 2-6 Nov 2015.
- Scheel, D., P. Godfrey-Smith, M. Lawrence. 2015. Signals of intent among *Octopus tetricus*. Behavior2015: International Ethology Congress, Cairns AU, August 2015.
- Godfrey-Smith, P., D. Scheel, M. Lawrence. 2015. Do octopuses use projectiles in conspecific interactions? Behavior2015: International Ethology Congress, Cairns AU, August 2015.
- Leite, T., D. Scheel, J. Mather. 2015. Habitat ecology and foraging the predator *Octopus cyanea* in the coral reef system of Moorea, French Polynesia. Behavior2015: International Ethology Congress, Cairns AU, August 2015.
- Chancellor, S.**, D. Scheel. 2015. Forage patches to measure giving-up density with giant Pacific octopus, *Enteroctopus dofleini*. Behavior2015: International Ethology Congress, Cairns AU, August 2015.
- Scheel, D., P. Godfrey-Smith, M. Lawrence. 2015. Signals of intent among *Octopus tetricus*. 52nd Annual Conference of the Animal Behavior Society, Anchorage AK 12 May 2015.
- Scheel, D. 2015. Sea-surface temperatures predict targeted visual surveys of octopus abundance. 30th Lowell Wakefield Fisheries Symposium, Anchorage AK 12 May 2015.
- Scheel, D. 2014. Biodiversity and the giant Pacific octopus: a three-part story of unexpected discoveries from nearly two decades of tide-pooling in Alaska. Second Biennial Giant Pacific Octopus Symposium and Workshop, Seattle Aquarium. 28 March 2014.

- Scheel, D., Godfrey-Smith, P., Lawrence, M. 2013. *Octopus tetricus* as ecosystem engineer: A report from Octopolis. Invited speaker to Department of Biological Sciences, University of Illinois Chicago. December 2013.
- Scheel, D. 2013. Awareness of Self & Others? Behavioral evidence for consciousness in octopuses & other animals. Presented to Philosophy of Biology at Dolphin Beach August 2013.
- Scheel, D. 2012. Remarks on the ecology of giant Pacific octopuses in relation to temperature. Presented to American Malacological Society, Cherry Hill NJ., June 2012.
- Scheel, D. 2012, Anderson, R.. Specialization in the diet of *Enteroctopus dofleini* examined from middens. 49th Annual meeting of the Animal Behavior Society, Albuquerque NM, June 2012.
- R.K. Toussaint**, G.K. Sage, D. Scheel and S.L. Talbot. 2012. Genetic analysis of giant Pacific octopuses in south-central and Dutch Harbor, AK. Giant Pacific Octopus Symposium and Workshop, Seattle Aquarium. 17 March 2012.
- Scheel, D. 2012. Temperature, movements, and anesthesia of giant Pacific octopuses. Giant Pacific Octopus Symposium and Workshop, Seattle Aquarium. 17 March 2012.
- Scheel, D., Anderson R. 2012. Meal size and specialization in the diet of octopuses. Kachemak Bay Science Conference. March 2012. Homer AK.
- Scheel, D, **L. Bisson**. 2011. Movement patterns of giant Pacific octopuses, *Enteroctopus dofleini* (Wülker, 1910). Presented to American Malacological Society, Pittsburgh, PA., July 2011.
- Scheel, D, **A. Kjellgren, L. Bisson**. 2010. The role of cues to navigation in movement patterns of giant Pacific octopuses. 47th Annual meeting of the Animal Behavior Society, Williamsburg VA, July 2010.
- L. Bisson** and D. Scheel. 2010. Environmental cues and size effects on short range giant Pacific Octopus movement. 47th Annual meeting of the Animal Behavior Society, Williamsburg VA, July 2010.
- Bisson, L.** & D. Scheel. 2010. The effect of environmental variables on the short range movement of the giant Pacific Octopus. Presented at: Anchorage Marine Science Symposium 2011.
- Scheel, D. 2009. Specialization in the diet of a generalist predator, *Enteroctopus dofleini*. Western Society of Naturalists. Monterey CA November, 2009.
- Scheel, D., **Frohbieter, D.** 2009. Octopus habitat selection for nearshore kelp stands in Prince William Sound, Alaska. Presented at the American Malacological Society, Ithaca NY, August 2009.
- Scheel, D., **Grund, J., Frohbieter, D.**, Vincent, T.L.S. 2008. Movements of *Enteroctopus dofleini* related to habitat characteristics in Prince William Sound, Alaska. Presented at the International Society of Behavioral Ecology, Ithaca NY, August 2008.
- Scheel, D. & T.L.S. Vincent. 2007. Octopus Impacts on Intertidal Crab Communities. Presented at the Western Society of Naturalists (Invited NaGISA talk). Ventura CA November, 2008.
- Vincent, T.L.S., **C. Lyons, M. Sirr** & D. Scheel. 2007. Size selection by octopuses (*Enteroctopus dofleini*) and its impact on intertidal crab communities. Presented at the Ecological Society of America, San Jose CA, August 2007.
- Scheel, D., **Grund, J.** Vincent, T.L.S. 2007. Movements of *Enteroctopus dofleini* in Alaska. Presented at the Animal Behavior Society, Burlington VT, August 2007.
- Lyons, C.**, D Scheel, L. Cornick, R. Dial. 2007. Community structuring impacts of *Enteroctopus dofleini* in Prince William Sound, Alaska. Presented at the Alaska Marine Sciences Symposium, Anchorage, January 2007.
- Scheel, D., **Grund, J.**, Vincent, T.L.S. 2006. Habitat selection and movements of *Enteroctopus dofleini* in Prince William Sound, Alaska: pilot studies with tagging and relocation. Presented at the American Malacological Society. Seattle WA, August 2006.
- Lyons, C.**, D Scheel. 2006. Community structuring impacts of *Enteroctopus dofleini* in Prince William Sound, Alaska. Presented at the American Malacological Society. Seattle WA, August 2006.

- Scheel, D., Vincent, T.L.S. The Giant Pacific Octopus (*Enteroctopus dofleini*) in Prince William Sound, Alaska - adaptive foraging, population trends, and climate change. Presented at the Cephalopod International Advisory Council Symposium, Hobart AU February 2006.
- Scheel, D. Shadowing the octopus: Meeting the need to monitor behavior of individual marine animals. Presented at the American Association for the Advancement of Science, Arctic division, Anchorage, Alaska October 2004.
- Scheel, D., **Lauster, A.** Habitat Ecology of *Enteroctopus dofleini* in Prince William Sound, Alaska: Ten Years past and Present. Presented at the 6th International Symposium Cephalopods, September 2004
- Scheel, D. *Enteroctopus dofleini* (Giant Pacific Octopus) habitats and fisheries. Presented at the 2nd Symposium on Marine Conservation Biology, San Francisco, June 2001.

Symposium and retreats

- Ford Foundation Faculty Fellow, Difficult Dialogs Related to Alaska Native Issues, 2009
- Ford Foundation Faculty Fellow, Encountering Controversies/Difficult Dialogs, May 2008
- Sitka Symposium, Island Institute, June 2001
- Writer's Retreat: Mesa Refuge, July 2001.

David Scheel _____ Teaching Experience

I have a cumulative of over ten FTE academic teaching-years as a college level instructor, gained in over thirty different biology and ecology-related courses (Listed in reverse chronological order).

Professor (Alaska Pacific University): FTE years, AY2000/01 to AY2014/15 with two years Sabbatical.

32. SC405 Environmental Ethics, Spring 2016
31. MAR224 Marine Field Work, Fall Block 2008-2009, 2011-2012
30. MAR 492 ST: Marine Biodiversity, Jan Block 2008
29. MAR 310 Scientific Diving, May Block 2003, 2005, 2009, 2011-2012
28. MAR 492 ST: Coral Propagation Techniques, Spring 2003
27. PH 302 Advanced topics in philosophy of Science (Mind; Evolution). Annually Spring 2002-2015.
26. MAR 205/305 Seabirds & Marine Mammals, Fall 2002, 2004, Spring 2011
25. MAR 330 Human Impacts in Marine Systems, Fall 2002-2005, 2010, 2016
24. MAR 290 Seminar Marine Biology, Spring 2002-2004; Mar490 2006, 2008, 2015, 2016
23. MAR 410 Coral Reef Ecology, January Block 2002, 2004, 2006
22. MAR 692 Graduate Seminar Readings in Marine Biology, Fall 2001, 2003, 2015
21. SC 213 Animal Behavior, Fall 2001, 2003, 2005, 2007, 2009, 2014
20. ST 292 Plankton Biology, May Block 2001
19. MAR 410 Marine Research Techniques, May Block 2001
18. MAR 215/315 Invertebrate Zoology, Spring 2001-2003, 2005, 2009, 2013, 2015
17. MAR 210 Aquarium Biology, Fall 2000-2002, 2004-2006, 2008-2010, 2012, 2014-2016
16. MAR 201 Marine Biology, Fall 2000, Fall Block 2001-2007
15. GS 132 Introduction to Active Learning, Fall 2000
14. SC 102 Introductory Botany & Zoology Fall Block 2000

Instructor at other institutions: (7 course semesters).

13. Conservation & Environmental Improvement (Carroll College, Waukesha WI),. Fall 1999.
12. Geographic Information Systems (Carroll College, Waukesha WI). Fall 1999.
11. Philosophy of Evolution (St. Lawrence University, Canton NY). Spring 1999
10. Behavioral Ecology (St. Lawrence University, Canton NY and as TA at the University of Minnesota). Spring 1998, Spring 1989
9. Geographic Information Systems for Ecological Research (PWS Community College, Cordova AK). Fall 1995.
8. Theoretical models of coexistence & resource use (Ecology, Evolution & Behavior, University of Minnesota). Spring 1992.
7. Introduction to Ecology (Ecology, Evolution and Behavior, University of Minnesota). Spring 1992.

Teaching Assistant: In the School of Biological Sciences, University of Minnesota, this position was as much a training program as a job. Graduate students in their first year were required to attend teacher training and to assist with both General Biology and General Ecology, under the guidance of faculty who evaluated our teaching and taught us pedagogy. Throughout the program, I was encouraged to teach an array of courses and to build new teaching skills. I took a seminar in interactive teaching, designed labs for Introductory Ecology, and taught seven different courses with an array of instructors (12 course semesters). For upper-level courses, I was responsible for content, design and teaching of a laboratory or recitation section, and gave guest lectures. I worked closely with students, designed labs, assignments, exams, and some lectures; and studied the teaching styles and examples of most of the professors in the Departments of Biology (BIO) and Ecology, Evolution and Behavior (EEB).

6. General Biology (BIO 1009) Winter 1992, Winter, Summer & Fall 1988, Winter & Spring 1986.
5. Animal Behavior (EEB 3111). Fall 1991.
4. General Biology with an Evolutionary Focus (BIO 1008) Winter & Spring 1991, Summer 1989.
3. General Ecology (EEB 5041) Fall 1990, Winter 1985; developed new laboratory lessons Fall 1989.
2. General Zoology (BIO 1106). Spring & Winter 1989, Spring 1988.
1. Natural History of Invertebrates (EEB field course). Summer 1985.