

Curriculum Vitae of Kenneth J. Lohmann
Charles P. Postelle, Jr. Distinguished Professor of Biology
University of North Carolina at Chapel Hill

Contact Information

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Education

Ph.D. (1988) in Zoology, University of Washington

Dissertation: Neural Correlates of Magnetic Field Detection and Geomagnetic Orientation in the Marine Mollusc *Tritonia diomedea*. Advisor: A. O. Dennis Willows.

M.S. (1983) in Zoology, University of Florida

B.S. (1981) in Zoology, Duke University, *Magna cum laude*

Professional Experience

2010 to present: Charles P. Postelle, Jr. Distinguished Professor of Biology, University of North Carolina

2003 to present: Professor of Biology/Adjunct Professor of Marine Sciences; Univ. North Carolina

1997 - 2003: Associate Professor of Biology, University of North Carolina

1991 - 1997: Assistant Professor of Biology, University of North Carolina

1990 to 1991: Postdoctoral Researcher, University of Washington Friday Harbor Laboratories

Supervisor: A. O. Dennis Willows

1990: Grass Fellowship in Neurophysiology, Marine Biological Laboratory, Woods Hole, Massachusetts.

1988 - 1990: Postdoctoral Fellow, Neural and Behavioral Biology Program, University of Illinois

Supervisor: Michael Salmon

1983 - 1988: Graduate Student Researcher, University of Washington

Advisory Committee: A. O. Dennis Willows, Raymond Huey, John Edwards, Thomas Quinn

1985: Neural Systems and Behavior class, Marine Biological Laboratory; Woods Hole, Massachusetts

1983: Invertebrate Neurophysiology class, Friday Harbor Laboratories; Friday Harbor, Washington

1982: Invertebrate Zoology class, Duke University Marine Laboratory; Beaufort, North Carolina

1980-1982: Summer Research Assistant, Duke University Marine Laboratory - *Supervisor: R. B. Forward*

Selected Honors and Awards

2017: Tanner Award for Excellence in Undergraduate Teaching, University of North Carolina

2017: President-elect, International Sea Turtle Society

2014: Fellow of the American Association for the Advancement of Science (AAAS)

2014: UNC Tri-Beta Professor of the Year for Excellence in the Teaching of Biology

2011: Fellow of the Royal Institute of Navigation (United Kingdom)

2010: appointed Charles P. Postelle, Jr. Distinguished Professor of Biology, University of North Carolina

1999-2004: L. G. Hoggard Distinguished Term Professor, University of North Carolina

2000: University of North Carolina at Chapel Hill Academy of Distinguished Teaching Scholars

1996: Tanner Award for Excellence in Undergraduate Teaching, University of North Carolina

1995: Hettleman Prize for Scholarly and Artistic Achievements by Young Faculty, Univ. North Carolina

1990: Grass Fellowship in Neurophysiology, Marine Biological Laboratory, Woods Hole, Massachusetts

1989: Finalist, Society for Neuroscience Donald B. Lindsley Prize in Behavioral Neuroscience
1977-1981: Westinghouse (now Intel) National Science Talent Search Scholarship

Selected Honors and Awards to Lab Trainees

2013 – 2017: Vanessa Bézy received a National Science Foundation predoctoral fellowship
2013: Roger Brothers received the Archie Carr Award for the best student talk at the 2013 International Sea Turtle Symposium in Baltimore, Maryland
2012: Courtney Endres received the Boyd Lyon Award for best talk at the 2012 Southeastern Regional Sea Turtle Symposium in Jekyll Island, Georgia
2011: Nathan Putman received the best talk award in the Division of Animal Behavior at the 2011 Society for Integrative and Comparative Biology meeting in Salt Lake City, Utah
2006 - 2010: Matthew Fuxjager received a National Science Foundation predoctoral fellowship
2001 - 2005: Michael Baltzley received a National Science Foundation predoctoral fellowship

Publications

Journal articles and book chapters:

96. Taylor, B.K., Johnsen, S. and Lohmann, K.J., 2017. Detection of magnetic field properties using distributed sensing: a computational neuroscience approach. **Bioinspiration & Biomimetics** 12(3): 036013.
95. Fitak, R.R., Wheeler, B.R., Ernst, D.A., Lohmann, K.J. and S. Johnsen, S. 2017. Candidate genes mediating magnetoreception in rainbow trout (*Oncorhynchus mykiss*). **Biology Letters** 13(4): 20170142.
94. Muñoz-Pérez, J.P., Lewbart, G.A., Hirschfeld, M., Alarcón-Ruales, D., Denking, J., Castañeda, J.G., García, J. and K. J. Lohmann. 2017. Blood gases, biochemistry and haematology of Galápagos hawksbill turtles (*Eretmochelys imbricata*). **Conservation Physiology** 5(1).
93. Ernst, D. and K. J. Lohmann. 2016. Effect of magnetic pulses on Caribbean spiny lobsters: Implications for magnetoreception. **Journal of Experimental Biology** 219: 1827-1832
doi:10.1242/jeb.136036.
92. Caillouet, C. W., Jr., Putman, N. F., Shaver, D. J., Valverde, R. A., Seney, E. E., Lohmann, K. J., Mansfield, K. L., Gallaway, B. J., Flanagan, J. P., and M. H. Godfrey. 2016. A call for evaluation of the contribution made by rescue, resuscitation, rehabilitation, and release translocations to Kemp's ridley sea turtle (*Lepidochelys kempii*) population recovery. **Herpetological Conservation and Biology** 11:486–496.
91. Endres, C. S., Putman, N. F., Ernst, D. A., Kurth, J. A., Lohmann, C. M. and K. J. Lohmann. 2016. Multi-Modal homing in sea turtles: Modeling dual use of geomagnetic and chemical cues in island-finding. **Frontiers in Behavioral Neuroscience** 10.
90. Gallaway, B. J., Gazey, W. J., Caillouet, C. W., Jr., Plotkin, P. T., Abreu-Grobois, F. A., Amos, A. F., Burchfield, P. M., Carthy, R. R., Castro-Martinez, M. A., Cole, J. G., Coleman, A. T., Cook, M., Dimarco, S., Epperly, S. P., Fukiwara, M., Gomez-Gamez, D., Graham, G. L., Griffin, W. L.,

- Illescas-Martinez, F., Lamont, M. M., Lewison, R. L., Lohmann, K. J., Nance, J. M., Pitchford, J., Putman, N. F., Raborn, S. W., Rester, J. K., Rudloe, J. J., Sarti-Martinez, L., Schexnayber, M., Schmid, J. R., Shaver, D. J., Slay, C., Tucker, A. D., Tumlin, M., Wibbels, T., and B. M. Zapata-Najera. 2016. Development of a Kemp's Ridley Sea Turtle Stock Assessment Model. **Gulf of Mexico Science** 2: 138–157.
89. Lohmann, K. J. 2016. Protein complexes: A candidate magnetoreceptor. **Nature Materials** 15(2): 136-138.
88. Lewbart, G. A., Hirschfeld, M., Brothers, J. R., Muñoz-Pérez, J. P., Denkinger, J., Vinueza, L., García, J., and K. J. Lohmann. 2015. Blood gases, biochemistry and haematology of Galápagos marine iguanas (*Amblyrhynchus cristatus*). **Conservation Physiology** 3(1): cov034.
87. Brothers, J. R. and K. J. Lohmann. 2015. Evidence for geomagnetic imprinting and magnetic navigation in the natal homing of sea turtles. **Current Biology**. 25: 392-396.
86. Putman, N. F., Verley, P., Endres, C. S. and K. J. Lohmann. 2015. Magnetic navigation behavior and the oceanic ecology of young loggerhead sea turtles. **Journal of Experimental Biology**. 218: 1044-1050.
85. Putman, N. F., Scanlan, M. M., Billman, E. J., O'Neil, J. P., Couture, R. B., Quinn, T. P., Lohmann, K. J., and D. L. G. Noakes. 2014. An inherited magnetic map guides ocean navigation in juvenile Pacific salmon. **Current Biology**. 24: 446-450.
84. Lohmann, K. J. and D. A. Ernst. 2014. The geomagnetic sense of crustaceans and its use in orientation and navigation. In: *Crustacean Nervous Systems and their Control of Behavior* (editors: C. D. Derby and M. Thiel), pp. 321-336. Oxford University Press: New York, New York.
83. Fuxjager, M. J., Davidoff, K. R., Mangiamele, L. A., and K. J. Lohmann. 2014. The geomagnetic environment in which sea turtle eggs incubate affects subsequent magnetic navigation behaviour of hatchlings. **Proceedings of the Royal Society B**. 281(1791): 20141218. doi:10.1098/rspb.2014.1218.
82. Lewbart, G. A., Hirschfeld, M., Denkinger, J., Vasco, K., Guevara, N., García, J., Muñoz, J., and K. J., Lohmann. 2014. Blood gases, biochemistry, and hematology of Galápagos green turtles (*Chelonia mydas*). **PLoS ONE**. e96487. doi:10.1371/journal.pone.0096487.
81. Putman, N. F., Lohmann, K. J., Putman, E. M., Quinn, T. P., Klimley, A. P., and D. L. G. Noakes. 2013. Evidence for geomagnetic imprinting as a homing mechanism for Pacific salmon. **Current Biology**. 23: 312-316.
80. Endres, C. S. and K. J. Lohmann. 2013. Detection of coastal mud odors by loggerhead sea turtles: a possible mechanism for sensing nearby land. **Marine Biology**. 160: 2951-2956.
79. Lohmann K. J., Lohmann, C. M. F., Brothers, J. R. and N. F. Putman. 2013. Natal homing and imprinting in sea turtles. In: *The Biology of Sea Turtles*, Vol. III (eds. J. Wyneken, K. J. Lohmann, and J. A. Musick), pp. 59-77. CRC Press, Boca Raton, FL.
78. Endres, C. S. and K. J. Lohmann. 2012. Perception of dimethyl sulfide (DMS) by loggerhead sea turtles: a possible mechanism for locating high-productivity oceanic regions for foraging. **Journal of Experimental Biology**. 215: 3535-3538.
77. Lohmann, K. J., Putman, N. F. and C. M. F. Lohmann. 2012. The magnetic map of hatchling loggerhead sea turtles. **Current Opinion in Neurobiology**. 22: 336-342.
76. Putman, N. F., Verley, P., Shay, T. J. and K. J. Lohmann. 2012. Simulating transoceanic migrations of young loggerhead sea turtles: merging magnetic navigation behavior with an ocean circulation model. **Journal of Experimental Biology**. 215: 1863-1870.

75. Fossette, S., Putman, N. F., Lohmann, K. J., Marsh, R. and G. C. Hays. 2012. A biologist's guide to assessing ocean currents: a review. **Marine Ecology Progress Series**. 457: 285-301.
74. Salmon, M., Carthy, R. R., Lohmann, C. M. F., Lohmann, K. J. and J. Wyneken. 2012. Collecting a sample of sea turtle hatchlings before a natural emergence does not reduce nest productivity. **Endangered Species Research**. 16: 295-299.
73. Baltzley, M. J., Sherman, A., Cain, S. D. and K. J. Lohmann. 2011. Conservation of a *Tritonia* Pedal peptide network in gastropods. **Invertebrate Biology**. 130: 313-324.
72. Putman, N. F., Endres, C. S., Lohmann, C. M. F. and K. J. Lohmann. 2011. Longitude perception and bicoordinate magnetic maps in sea turtles. **Current Biology**. 21: 463-466.
71. Fuxjager, M. J., Eastwood, B. S. and K. J. Lohmann. 2011. Orientation of hatchling loggerhead sea turtles to regional magnetic fields along a transoceanic migratory pathway. **Journal of Experimental Biology**. 214: 2504-2508.
70. Mähger, L. M., Lohmann, K. J., Limpus, C. J. and K. A. Fritsches. 2011. An unsuccessful attempt to elicit orientation responses to linearly polarized light in hatchling loggerhead sea turtles (*Caretta caretta*). **Philosophical Transactions of the Royal Society B**. 366: 757-762.
69. Putman, N. F., Bane, J. M. and K. J. Lohmann. 2010. Sea turtle nesting distributions and oceanographic constraints on hatchling migration. **Proceedings of the Royal Society B**. 277: 3631-3637.
68. Lohmann, K. J. 2010. Magnetic-field perception: News and Views Q&A. **Nature**. 464: 1140-1142.
67. Putman, N. F., Shay, T. J. and K. J. Lohmann. 2010. Is the geographic distribution of nesting in the Kemp's ridley turtle shaped by the migratory needs of offspring? **Integrative and Comparative Biology**. 50(3): 305-314.
66. Lohmann, C. M. F. and K. J. Lohmann. 2010. Orientation and navigation in sea turtles. In: *Encyclopedia of Animal Behavior* (eds. M. D. Breed and J. Moore), pp. 101-107. Academic Press/Elsevier, Amsterdam.
65. Endres, C. S., Putman, N. F. and K. J. Lohmann. 2009. Perception of airborne odors by loggerhead sea turtles. **Journal of Experimental Biology**. 212: 3823-3827.
64. Lohmann, K. J. and C. M. F. Lohmann. 2009. Magnetic map. In: *Encyclopedia of Neuroscience* (eds. M. D. Binder, N. Hirokawa, and U. Windhorst). DOI: 10.1007/978-3-540-29678-2_3273. Elsevier Science, New York.
63. Lohmann, K. J., Putman, N. F. and C. M. F. Lohmann. 2008. Geomagnetic imprinting: A unifying hypothesis of long-distance natal homing in salmon and sea turtles. **Proceedings of the National Academy of Sciences**. 105: 19096-19101.
62. Baltzley, M. J. and K. J. Lohmann. 2008. Comparative study of TPep-like immunoreactive neurons in the central nervous system of nudibranch molluscs. **Brain, Behavior, and Evolution**. 72: 192-206.
61. Lohmann, K. J., Lohmann, C. M. F. and C. S. Endres. 2008. The sensory ecology of ocean navigation. **Journal of Experimental Biology**. 211: 1719-1728.
60. Miller, M. M., Rutkowski, A. J. and K. J. Lohmann. 2008. Nature's navigators: an overview of biologically-inspired navigation. **Navigation**. 55(2): 99-100.
59. Lohmann, K. J. and C. M. F. Lohmann. 2008. Geomagnetic navigation and magnetic maps in sea turtles. **Navigation**. 55(2): 115-125.

58. Putman, N. F. and K. J. Lohmann. 2008. Compatibility of magnetic imprinting and secular variation. **Current Biology**. 18(14): R596-R597.
57. Johnsen, S. and K. J. Lohmann. 2008. Magnetoreception in animals. **Physics Today**. 61(3): 29-35.
56. Lohmann, K. J., Luschi, P. and G. C. Hays. 2008. Goal navigation and island-finding in sea turtles. **Journal of Experimental Marine Biology and Ecology**. 356: 83-95.
55. Lohmann, K. J., Lohmann, C. M. F. and N. F. Putman. 2007. Magnetic maps in animals: Nature's GPS. **Journal of Experimental Biology**. 210: 3697-3705. (Invited commentary)
54. Wang, J. H., Boles, L. C., Higgins, B. and K. J. Lohmann. 2007. Behavioral responses of sea turtles to lightsticks used in longline fisheries. **Animal Conservation**. 10: 176-182.
53. Lohmann, K. J. 2007. Sea turtles: navigating with magnetism. **Current Biology**. 17(3): R102-R104.
52. Cain, S. D., Wang, J. H. and K. J. Lohmann. 2006. Immunochemical and electrophysiological analyses of magnetically responsive neurons in the mollusc *Tritonia diomedea*. **Journal of Comparative Physiology A**. 192: 235-245.
51. Lohmann, C. M. F. and K. J. Lohmann. 2006. Quick Guide to Sea Turtles. **Current Biology**. 16(18): R784-R786.
50. Lohmann, K. J. and C. M. F. Lohmann. 2006. Sea turtles, lobsters, and oceanic magnetic maps. **Marine and Freshwater Behaviour and Physiology**. 39(1): 49-64. (Invited review article)
49. Johnsen, S. and K. J. Lohmann. 2005. The physics and neurobiology of magnetoreception. **Nature Reviews Neuroscience**. 6: 703-712. (Invited review article)
48. Cain, S. D., Boles, L. C., Wang, J. H. and K. J. Lohmann. 2005. Magnetic orientation and navigation in marine turtles, lobsters, and molluscs: concepts and conundrums. **Integrative and Comparative Biology**. 45: 539-546
47. Irwin, W. P. and K. J. Lohmann. 2005. Disruption of magnetic orientation in loggerhead sea turtle hatchlings by pulsed magnetic fields. **Journal of Comparative Physiology A**. 191: 475-480.
46. Lohmann, K. J., Lohmann, C. M. F., Ehrhart, L. M., Bagley, D. A. and T. Swing. 2004. Geomagnetic map used in sea-turtle navigation. **Nature**. 428: 909-910.
45. Wang, J. H., Cain, S. D. and K. J. Lohmann. 2004. Identifiable neurons inhibited by earth-strength magnetic stimuli in the marine mollusc *Tritonia diomedea*. **Journal of Experimental Biology**. 207: 1043-1049.
44. Johnsen, S. and K. J. Lohmann. 2004. Neurobiology of geomagnetic orientation in animals. In: *Encyclopedia of Neuroscience* (eds. G. Adelman and B. H. Smith). Elsevier Science, New York.
43. Avens, L. and K. J. Lohmann. 2004. Navigation and seasonal migratory orientation in juvenile sea turtles. **Journal of Experimental Biology**. 207: 1771-1778.
42. Irwin, W. P., Horner, A. and K. J. Lohmann. 2004. Magnetic field distortions produced by protective cages around sea turtle nests: unintended consequences for orientation and navigation? **Biological Conservation**. 118: 117-120.
41. Boles, L. C. and K. J. Lohmann. 2003. True navigation and magnetic maps in spiny lobsters. **Nature**. 421: 60-63.
40. Lohmann, K.J. and C.M.F. Lohmann. 2003. Orientation mechanisms of hatchling loggerheads. In: *Loggerhead Sea Turtles* (eds. A. Bolten and B. Witherington), pp. 44-62. Smithsonian Institution Press, Washington, D.C. (Invited book chapter)

39. Irwin, W. P. and K. J. Lohmann. 2003. Magnet-induced disorientation in hatchling loggerhead sea turtles. **Journal of Experimental Biology**. 206: 497-501.
38. Avens, L., Braun-McNeil, J., Epperly, S. and K. J. Lohmann. 2003. Site fidelity and homing in juvenile loggerhead sea turtles (*Caretta caretta*). **Marine Biology**. 143: 211-220.
37. Wang, J. H., Cain, S. D. and K. J. Lohmann. 2003. Identification of magnetically sensitive neurons in the marine mollusc *Tritonia diomedea*. **Journal of Experimental Biology**. 206: 381-388.
36. Avens, L. and K. J. Lohmann. 2003. Use of multiple orientation cues by juvenile loggerhead sea turtles (*Caretta caretta* L.). **Journal of Experimental Biology**. 206: 4317-4325.
35. Avens, L., Wang, J. H., Johnsen, S., Dukes, P. and K. J. Lohmann. 2003. Responses of hatchling sea turtles to rotational displacements. **Journal of Experimental Marine Biology and Ecology**. 288: 111-124.
34. Lohmann, K.J., Cain, S. D., Dodge, S. A. and C. M. F. Lohmann. 2001. Regional magnetic fields as navigational markers for sea turtles. **Science**. 294: 364-366.
33. Lohmann, K. J. and S. Johnsen. 2000. The neurobiology of magnetoreception in vertebrate animals. **Trends in Neurosciences**. 23: 153-159. (Invited review)
32. Nevitt, G., Pentcheff, N. D., Lohmann, K. J., and R. K. Zimmer. 2000. Den selection by the spiny lobster *Panulirus argus*: testing attraction to conspecific odors in the field. **Marine Ecology Progress Series**. 203: 225-231.
31. Lohmann, K. J., Hester, J. T. and C. M. F. Lohmann. 1999. Long-distance navigation in sea turtles. **Ethology, Ecology, and Evolution**. 11: 1-23. (Invited article)
30. Lohmann, K. J. 1999. Neurobiology of geomagnetic orientation in animals. In: *Encyclopedia of Neuroscience*, second edition (Adelman, G. and B. H. Smith, eds.), pp. 788-791. Amsterdam: Elsevier Science. (Invited review)
29. Goff, M., Salmon, M. and K. J. Lohmann. 1998. Hatchling sea turtles use surface waves to establish a magnetic compass direction. **Animal Behaviour**. 55: 69-77.
28. Lohmann, K. J. and C. M. F. Lohmann. 1998. Migratory guidance mechanisms in marine turtles. **Journal of Avian Biology** (Optimal Migration Symposium Volume) 29: 585-596.
27. Wang, J. H., Jackson, J. K. and K. J. Lohmann. 1998. Perception of wave surge motion by hatchling sea turtles. **Journal of Experimental Marine Biology and Ecology**. 229: 177-186.
26. Lohmann, K. J. and C. M. F. Lohmann. 1998. Sea turtle navigation and the detection of geomagnetic field features. **Journal of Navigation**. 51(1): 10-22. (Invited review)
25. Lohmann, K. J., Witherington, B. E., Lohmann, C. M. F., and M. Salmon. 1997. Orientation, navigation, and natal beach homing in sea turtles. In: *Biology of Sea Turtles* (eds. P. Lutz and J. Musick), pp. 107-135. CRC Press: Boca Raton. (Invited book chapter)
24. Manning, E. L., Cate, H. S., and K. J. Lohmann. 1997. Discrimination of ocean wave features by hatchling sea turtles. **Marine Biology**. 127: 539-544.
23. Lohmann, K. J. and C. M. F. Lohmann. 1996. Detection of magnetic field intensity by sea turtles. **Nature**. 380: 59-61.
22. Lohmann, K. J. and C. M. F. Lohmann. 1996. Orientation and open-sea navigation in sea turtles. **Journal of Experimental Biology**. 199: 73-81. (Invited review)
21. Lohmann, K. J., Swartz, A. W. and C. M. F. Lohmann. 1995. Perception of ocean wave direction by sea turtles. **Journal of Experimental Biology**. 198: 1079-1085.

20. Lohmann, K. J., Pentcheff, N. D., Nevitt, G. A., Stetten, G., Zimmer-Faust, R. K., Jarrard, H. E. and L. C. Boles. 1995. Magnetic orientation of spiny lobsters in the ocean: experiments with undersea coil systems. **Journal of Experimental Biology**. 198: 2041-2048.
19. Nevitt, G. A., Pentcheff, N. D., Lohmann, K. J., and R. K. Zimmer-Faust. 1995. Hydrodynamic orientation by spiny lobsters: field manipulations in a patch reef environment. **Journal of Experimental Biology**. 198: 2049-2054.
18. Lohmann, K. J. and C. M. F. Lohmann. 1994. Detection of magnetic inclination angle by sea turtles: a possible mechanism for determining latitude. **Journal of Experimental Biology**. 194: 23-32.
17. Lohmann, K. J. and C. M. F. Lohmann. 1994. Acquisition of magnetic directional preference in loggerhead sea turtle hatchlings. **Journal of Experimental Biology**. 190: 1-8.
16. Lohmann, K. J. 1993. Magnetic compass orientation. **Nature**. 362: 703.
15. Light, P., Salmon, M. and K. J. Lohmann. 1993. Geomagnetic orientation of loggerhead sea turtles: evidence for an inclination compass. **Journal of Experimental Biology**. 182: 1-10.
14. Lohmann, K. J. and C. M. F. Lohmann. 1993. A light-independent magnetic compass in the leatherback sea turtle. **Biological Bulletin**. 185: 149-151.
13. Lohmann, K. J. and C. M. F. Lohmann. 1992. Orientation to oceanic waves by hatchling green turtles. **Journal of Experimental Biology**. 171:1-13.
12. Lohmann, K. J. 1992. How sea turtles navigate. **Scientific American**. 266(1): 100-106.
11. Lohmann, K. J., Willows, A. O. D. and R. B. Pinter. 1991. An identifiable molluscan neuron responds to changes in earth-strength magnetic fields. **Journal of Experimental Biology**. 161:1-24.
10. Lohmann, K. J. 1991. Magnetic orientation by hatchling loggerhead sea turtles (*Caretta caretta*). **Journal of Experimental Biology**. 155: 37-49.
9. Lohmann, K. J., Salmon, M. and J. Wyneken. 1990. Functional autonomy of land and sea orientation systems in sea turtle hatchlings. **Biological Bulletin**. 179: 214-218.
8. Wyneken, J., Salmon, M. and K. J. Lohmann. 1990. Orientation by hatchling loggerhead sea turtles (*Caretta caretta* L.) in a wave tank. **Journal of Experimental Marine Biology and Ecology**. 139: 43-50.
7. Lohmann, K. J. and A. O. D. Willows. 1989. Magnetic field detection and its neurobiological mechanisms. **Neuroscience Year**. 1: 94-97. (Invited review)
6. Salmon, M. and K. J. Lohmann. 1989. Orientation cues used by hatchling loggerhead sea turtles (*Caretta caretta* L.) during their offshore migration. **Ethology**. 83: 215-228.
5. Lohmann, K. J. and A. O. D. Willows. 1987. Lunar-modulated geomagnetic orientation by a marine mollusk. **Science**. 235: 331-334.
4. Lohmann, K. J. 1985. Geomagnetic field detection by the western Atlantic spiny lobster, *Panulirus argus*. **Marine Behaviour and Physiology**. 12: 1-17.
3. Lohmann, K. J. 1984. Magnetic remanence in the western Atlantic spiny lobster, *Panulirus argus*. **Journal of Experimental Biology**. 113: 29-41.
2. Forward, R. B. Jr., and K. J. Lohmann. 1983. Control of egg hatching in the crab *Rhithropanopeus harrisi* (Gould). **Biological Bulletin**. 165: 154-166.
1. Forward, R. B. Jr., Lohmann, K. and T. W. Cronin. 1982. Rhythms in larval release by an estuarine crab (*Rhithropanopeus harrisi*). **Biological Bulletin**. 163: 287-300.

Books and Special Volumes Edited:

The Biology of Sea Turtles, Vol. 3. 2013. (Editors: J. Wyneken, K. J. Lohmann, and J. A. Musick). CRC Press, Boca Raton, FL.

Bio-Navigation (special issue of the journal *Navigation* (vol. 55, no. 2), published 2008); co-edited with Mikel Miller).

Extramural Research Support

Geomagnetic Imprinting and Natal Homing in Sea Turtles, National Science Foundation IOS-1456923, 6/15-5/18. Total amount: \$555,000. Role on project: PI, with co-PI Catherine Lohmann.

Long-Range Geomagnetic Navigation in Sea Turtles: An Interdisciplinary Approach to Localizing Magnetite-based Biological Magnetoreceptors, Air Force Office of Scientific Research FA9550-14-1-0208; 9/14-9/19. Total amount: \$2,462,029. Role on project: PI, with co-PIs Amy Oldenburg and Sonke Johnsen.

Geomagnetic Navigation Behavior in Sea Turtles, National Science Foundation IOS-1022005, 9/10-8/15. Total amount: \$500,000. Role on project: PI, with co-PI Catherine Lohmann.

Geomagnetic Imprinting and Homing in Salmon and Steelhead, Oregon Sea Grant, 2012-2014. Total amount: \$179,270. Role on project: co-PI, with PI David Noakes.

Geomagnetic Maps and Magnetic Navigation in Sea Turtles, National Science Foundation IOS-0718991, 2007-2011. Total amount: \$412,109. Role on project: PI, with co-PI Catherine Lohmann.

Developing Turtle-Safe Light Sticks for Daytime Longline Fisheries, National Marine Fisheries Service, 2006-2008. Total amount: \$52,999. Role on project: PI.

Using Sensory Biology to Reduce Sea Turtle Bycatch in the Longline Fisheries, National Marine Fisheries Service, 2005-2007. Total amount: \$30,001. Role on project: PI.

Behavioral Responses of Sea Turtles to Experimental Light Sticks, National Marine Fisheries Service, 2005. Total amount: \$20,000. Role on project: PI.

Geomagnetic Guidance Mechanisms in Sea Turtles, National Science Foundation IBN-0344387, 2004-2008. Total amount: \$413,000. Role on project: PI.

Behavioral Physiology of Sea Turtle Sensory Abilities, National Marine Fisheries Service, contracts 40ABNF111702 / AB133F-02-CN-0093, 2001-2004. Total amount: \$340,931. Role on project: PI.

Magnetic Position-Finding and Navigation in Sea Turtles, National Science Foundation IBN-9816065, 1999-2003. Total amount: \$160,000. Role on project: PI.

Biologically Inspired Underwater Navigation Based on Geomagnetism, Office of Naval Research Small Business Technology Transfer (STTR) Program, 2001-2003. (This was a collaborative project requiring participation of both a small business and a university lab). Total amount of funding to Madison Technologies Incorporated, Ltd. (the small business): \$99,956. Amount of UNC subcontract: \$24,211.

Responses of Pelagic-stage Loggerhead Turtles to Light Sticks and Gangions used in Longline Fisheries, National Marine Fisheries Service, 1999-2000. Total amount: \$78,763. Role on project: PI.

Magnetic Cues and Navigation in Sea Turtles, National Geographic Society, 1997-1998. Total amount: \$14,900. Role on project: co-PI, with PI Michael Salmon.

Neural Basis of Magnetic Field Detection in a Mollusc, National Science Foundation IBN-96331951, 1996-1999. Total amount: \$150,340. Role on project: PI.

Mechanisms of Orientation and Navigation Behavior in Sea Turtles, National Science Foundation IBN 9419993, 1995-1998. Total amount: \$108,708 (including \$8K REU supplement). Role on project: PI.

Geomagnetic Orientation Behavior of Migratory Sea Turtles, National Science Foundation BNS 9120338, 1992-1996. Total amount: \$98,389. Role on project: PI.

*Mechanisms of Orientation in the Spiny Lobster, *Panulirus argus**, National Undersea Research Center/National Oceanic and Atmospheric Administration. 1993-1994. Total amount: \$20,000. Role on project: PI.

Orientation Mechanisms of Homing in the Western Atlantic Spiny Lobster, National Undersea Research Center/National Oceanic and Atmospheric Administration. 1992-1993. Total amount: \$15,100. Role on project: PI.

Teaching Experience

Teaching in International Classes and at Marine Laboratories

2012: Taught UNC Study Abroad class on *Biology of Marine Animals* in the Galapagos Islands, Ecuador.
2004 – 2016: Guest lecturer in international graduate class in *Sensory Ecology*, taught every two years at Lund University in Lund, Sweden.

1985, 1986, 1988: Teaching assistant for *Invertebrate Neurophysiology*, an intensive lab-based 5-week class taught at the University of Washington Friday Harbor Laboratories in the San Juan Islands.

Undergraduate Classes Taught at the University of North Carolina

Introduction to Neurobiology (Biology 450)
Behavioral Neuroscience (Biology 455)
Biology of Marine Animals (Biology 475)

Graduate Seminars Taught at the University of North Carolina

Scientific Writing
Magnetoreception: How Animals Use and Detect the Earth's Magnetic Field
Biology and Conservation of Sea Turtles
Animal Orientation and Navigation
Experimental and Statistical Design (co-taught with K. W. Sockman)
Using Ocean Circulation Models to Study Marine Animal Movements (co-taught with N. F. Putman)
Special Topics in Organismal Biology (co-taught with W. M. Kier)
Special Topics in Sensory Biology and Behavioral Endocrinology (co-taught with K. W. Sockman)

Invited Research Presentations (2003-2017)

2017: Department of Biology, University of North Carolina at Pembroke

2017: Winter Animal Behavior Conference; Steamboat Springs, Colorado.

2017: Society for Integrative and Comparative Biology; New Orleans, Louisiana.

2016: International Titisee Conference on Molecules and Mechanisms of Magneto, Thermo, and Mechanosensation; Titisee, Black Forest, Germany.

2016: Air Force Office of Scientific Research, Sensory Biology Portfolio Review; Dayton, Ohio.

2016: Lund University Sensory Ecology Class (international graduate class in Lund, Sweden)

2016: University of North Carolina Biology External Advisory Board

2016: Community Public Lecture, Puerto Baquerizo Moreno; San Cristobal, Galapagos Islands, Ecuador

2016: Winter Animal Behavior Conference; Steamboat Springs, Colorado.

2016: Society for Integrative and Comparative Biology; Portland, Oregon

2015: Air Force Office of Scientific Research, Sensory Biology Portfolio Review; Arlington, Virginia.

2015: Symposium on Physiology, Behavior, and Ecology of Fish Navigation; American Fisheries Society Meeting; Portland, Oregon.

2015: Air Force Office of Scientific Research; Fort Walton Beach, Florida.

2015: Department of Biological Sciences, Purdue University; West Lafayette, Indiana

2014: Lund University Sensory Ecology Class (international graduate class in Lund, Sweden)

2014: National Institute of Aquatic Resources, Danish Technical University; Silkeborg, Denmark

2014: Keynote address, Ocean Tracking Network Symposium; American Fisheries Society Meeting; Quebec City, Quebec, Canada.

2014: Department of Biology, Wake Forest University; Winston-Salem, North Carolina.

2014: Elise Newell Seminar Series, Public Lecture, Barrier Island Center; Melbourne Beach, Florida.

2014: Elise Newell Seminar Series, University of Central Florida; Orlando, Florida.

2013: DownUnder Scuba Club; Durham, North Carolina.

2013: Keynote address, Bio-navigation Symposium, Royal Institute of Navigation; Egham, England

2012: Lund University Sensory Ecology Class (international graduate class in Lund, Sweden)

2012: Community Public Lecture, Galapagos Science Center; San Cristobal, Galapagos Islands, Ecuador

2012: Galapagos Institute for the Arts and Sciences; San Cristobal, Galapagos Islands, Ecuador

2012: Department of Biology, Lund University; Lund, Sweden

2012: Department of Neurobiology, University of Massachusetts Medical School; Worcester, Massachusetts

2011: Friday Lecture Series, Rockefeller University; New York, New York

2011: Advances in Animal Migration Symposium, American Geophysical Union annual meeting; San Francisco, California

2011: Spectrum Lecture Series, Denison University; Granville, Ohio

2011: Cognitive, Sensory and Behavioral Frontiers Symposium, American Fisheries Society Meeting; Seattle, Washington

2011: Sensory Neuroecology Symposium, Animal Behavior Society/International Ethological Conference; Bloomington, Indiana

2011: Oregon Hatchery Research Center, Workshop on Homing and Straying in Salmon; Alsea, Oregon

2010: Lund University Sensory Ecology Class (international graduate class in Lund, Sweden)

2010: Hatfield Marine Science Center; Newport, Oregon (May, 2010)

2010: Center for the Integrative Study of Animal Behavior, Indiana University; Bloomington, Indiana

2010: Integrative Migration Biology Symposium, Society for Integrative and Comparative Biology; Seattle, Washington

2009: Howard Hughes Medical Institute, Janelia Farm Research Campus, Virginia

2009: North Carolina State College of Veterinary Medicine Invertebrate Club; Raleigh, North Carolina

2009: Department of Ecology and Evolution, University of California at Santa Cruz

2009: Mon Repos Conservation Park; Mon Repos, Queensland, Australia

2008: Institute of Marine Sciences, University of North Carolina; Morehead City, North Carolina

2008: Lund University Sensory Ecology Class (international graduate class in Lund, Sweden)

2008: NOAA Northwest Fisheries Science Center; Seattle, Washington

2008: Galapagos Initiative Symposium, Universidad San Francisco de Quito; Quito, Ecuador

2008: Kenneth Roeder Memorial Lecture, Dept. of Biology, Tufts University; Medford, Massachusetts

2008: Department of Neurobiology and Behavior, Cornell University; Ithaca, New York
 2008: Department of Biology, University of Virginia; Charlottesville, Virginia
 2008: Bauer Foundation Colloquium Speaker, Brandeis University; Boston, Massachusetts
 2007: Department of Biology, University of Utah; Salt Lake City, Utah (student-selected speaker)
 2007: Duke University Marine Laboratory; Beaufort, North Carolina
 2007: Symposium on Neurosensory Ecology (sponsored by *Journal of Experimental Biology*); Il Cicalino, Tuscany, Italy
 2007: Plenary address, International Congress of Neuroethology; Vancouver, British Columbia, Canada
 2007: Keynote address, BioNavigation Workshop, *Institute of Navigation Annual Meeting*; Cambridge, Massachusetts
 2006: Department of Biology, University of Pennsylvania; Philadelphia, Pennsylvania
 2006: Department of Biology, University of South Carolina; Columbia, South Carolina
 2006: Lund University Sensory Ecology Class (international graduate class in Lund, Sweden)
 2006: Department of Biology, Clemson University (student-selected speaker), Clemson, South Carolina.
 2006: Sea Turtle and Fish Sensory Biology Workshop, National Marine Fisheries Service, Virginia Institute of Marine Sciences Eastern Shore Lab, Wachapreague, Virginia
 2006: Duke University Marine Laboratory, guest lectures in Sea Turtle Conservation and Biology class, Beaufort, North Carolina
 2006: Harbor Branch Oceanographic Institute, Fort Pierce, Florida
 2006: Department of Biological Sciences, Florida Atlantic University; Boca Raton, Florida
 2006: Sea Secrets Public Lecture sponsored by University of Miami; Naples, Florida
 2006: Peter Lutz Memorial Symposium, 26th Annual Sea Turtle Symposium, Island of Crete, Greece (unable to attend due to illness).
 2006: Department of Zoology, University of Toronto
 2006: Department of Biology, University of Minnesota at Duluth
 2006: Dept. of Psychology colloquium, Brown University
 2005: Centennial Celebration; Carnegie Institution Lab for Tropical Marine Biology, Key West, Florida
 2005: Gordon Research Conference on Neuroethology, Oxford University, Oxford, England
 2005: National Marine Fisheries Service, Fish/Sea Turtle Sensory Biology Workshop, Chapel Hill, North Carolina
 2005: Department of Bioengineering, California Institute of Technology
 2005: Plenary speaker, 25th Annual International Sea Turtle Symposium, Savannah, Georgia
 2004: Sea Secrets Public Lecture, University of Miami; Miami, Florida
 2004: Zoology Institute, Frankfurt University, Frankfurt, Germany
 2004: Dept. of Cell and Organism Biology, University of Lund, Sweden
 2004: Lund University Sensory Ecology Class (international graduate class in Lund, Sweden)
 2004: Duke University Marine Laboratory (guest lecture in class on sea turtle biology)
 2004: Neuroscience Program, Georgia State University; Atlanta, Georgia (student-selected speaker)
 2004: Plenary speaker, North Carolina Academy of Sciences annual meeting
 2003: University of Illinois, Neuroscience Program; Champaign-Urbana, Illinois
 2003: North Carolina State University, Department of Zoology; Raleigh, North Carolina
 2003: 8th Annual Spin Chemistry Conference; Chapel Hill, North Carolina
 2003: Briefing for National Marine Fisheries Service; Honolulu, Hawaii

Public Education: Selected Media Coverage, Interviews, and Articles

Selected Print and Internet Articles on Lohmann Lab Research (since 2011)

British Broadcasting Corporation: [Sea Turtles Find Nesting Sites Using Magnetic Fields](#) (2015)

Nature: [*Turtles' Magnetic Attraction to Home*](#) (2015)
 Science: [*Magnetic Beacons Shepherd Turtles Home*](#) (2015)
 National Geographic: [*How Do Sea Turtles Find the Exact Beach Where They Were Born?*](#) (2015)
 Los Angeles Times: [*Sea Turtle Finds Her Way Back to Birth Beach, But How?*](#) (2015)
 British Broadcasting Corporation: [*Pacific Salmon Migrate With a Magnetic Map*](#) (2014)
 Scientific American: [*Salmon Use Magnetic Field-Based Internal Maps to Find Their Way*](#) (2014)
 Science: [*ScienceShot: Sea Turtles Smell Nearby Shores*](#) (2013)
 Psychology Today: [*Saga of the Sea Turtle Part I: From Beach to Open Ocean*](#) (2013)
 Psychology Today: [*Saga of the Sea Turtle Part II: the Epic Migration*](#) (2013)
 New York Times: [*Following the compass home*](#) (2013)
 British Broadcasting Corporation: [*Sockeye salmon 'sense magnetic field of home'*](#) (2013)
 National Geographic: [*Mystery solved: salmon navigate using magnetic field*](#) (2013)
 National Science Foundation: [*Questions about incredible sea turtle migration answered by scientists*](#) (2012)
 World Science: [*Smart Swimming, Magnetism Said to Help Baby Turtles Through Epic Migration*](#) (2012)
 Ocean Minds: [*Swimming Helps Simulated Turtles Stay on Course*](#) (2012)
 The Economist: [*Scents and Sensibility*](#) (2012)
 National Public Radio: [*For Turtles, Earth's Magnetism is a Built-in GPS*](#) (2011)
 British Broadcasting Corporation: [*Sea turtles' migration mystery is 'solved'*](#) (2011)
 National Geographic: [*Turtles use the Earth's Magnetic Field as a Global GPS*](#) (2011)
 Science Daily: [*Migrating Sea Turtles have Magnetic Sense for Longitude*](#) (2011)

Selected Radio Interviews

Canadian Broadcasting Corporation "Quirks and Quarks"; March, 2011
 British Broadcasting Corporation (BBC) radio; December, 2008
 Canadian Broadcasting Corporation "Quirks and Quarks"; December, 2008
 Voice of America; December 2008
 British Broadcasting Corporation (BBC) radio, Great Britain; Spring, 2008.
 Australian Broadcasting Corporation; Spring, 2005.
 Radio 4, Great Britain; Spring, 2002
 British Broadcasting Corporation for BBC International; Spring, 2002.
 Todd Mundt Show (National Public Radio); Spring, 2002.
 Forschung aktuell, German Public Radio. Autumn, 2001.
 Quirks and Quarks, Canadian Broadcasting Corporation. Autumn, 2001.
 Florida Environmental Radio. Autumn, 2001.
 British Broadcasting Corporation, April 1997; Oxford, England.
 KCBS, San Francisco; March, 1996.
 British Broadcasting Corporation, March, 1996.
 Canadian Broadcasting Corporation; March, 1996.
 American Institute of Physics Science Report; January, 1995.
 Earthwatch Radio Program, Univ. of Wisconsin Sea Grant Institute. November, 1995.
 Radio 4 in Plymouth, England; April, 1994.

Selected Television Interviews and Documentaries

Interviewed for television documentary produced by Korean Broadcasting Corporation. Aired in South Korea in 2003.
 Television interview for Discovery Channel Canada. Aired in 2001.
 Television interview for "Animal Tracks", produced by Discovery Channel - Canada. Aired in 1997.
 Appeared in "Understanding Magnetism", a documentary produced for The Learning Channel by Kronkite-Ward. Aired in 1994.

Educational Web Sites Created:

“[Sea Turtle Navigation](#)” presents highlights of our research on sea turtles for the general public. The site is used in science classes at numerous educational institutions.

“[Lohmann Lab](#)” summarizes research done in our lab, provides links to online news articles about the work, and allows users to download published research papers.

Professional Service

Advisory:

Advisory Board, Galapagos Science Center (2012 to present)

Steering Committee, Galapagos Science Center (2008 to present)

Advisory Committee, *Royal Institute of Navigation* Animal Navigation Group (2008 to present)

Editorial:

Editorial Board, *Animal Migration* (2012 to present)

Editorial Advisory Board, *Journal of Navigation* (U.K. Royal Institute of Navigation). (2013-2016)

Editorial Board, Springer Book Series on Galapagos Islands (2012 to present)

Grant Review Panels:

1999 review panel for Animal Behavior Program, National Science Foundation

2005 review panel for Animal Behavior Program, National Science Foundation

1993 review panel for Grass Foundation Fellowships in Neurophysiology, Marine Biological Laboratory

Ad hoc reviewer for:

- ❖ **More than 50 Scientific Journals**, including: American Journal of Physics; American Journal of Physiology; Animal Behaviour; Animal Cognition; Aquatic Biology; Aquatic Ecology; Behavioral Ecology; Behavioral Ecology and Sociobiology; Bioelectromagnetics; Biogeosciences; Biology Letters; BioScience; Biological Bulletin; Brain, Behavior, and Evolution; Canadian Journal of Zoology; Chelonian Conservation and Biology; Clinical Neurophysiology; Copeia; Comparative Biochemistry and Physiology; Current Biology; European Journal of Entomology; Frontiers in Behavioral Neuroscience; Fisheries Oceanography; Geobiology; Geology Marine Letters; Integrative and Comparative Biology; Journal of Comparative Physiology A; Journal of Comparative Psychology; Journal of Experimental Biology; Journal of Experimental Marine Biology and Ecology; Journal of Geophysical Research; Journal of the Royal Society Interface; Journal of Navigation; Journal of South American Earth Sciences; Journal of Theoretical Biology; Marine Biology; Marine Ecology Progress Series; Marine and Freshwater Behaviour and Physiology; Nature; Nature Communications; Naturwissenschaften; Neuron; Navigation; Oikos; PLoSOne; Proceedings of the National Academy of Sciences; Proceedings of the Royal Society B; Proceedings of the Royal Society of London; Science; Southwestern Naturalist; Trends in Ecology and Evolution.
- ❖ **More than 25 Granting Agencies/Panels**, including: Air Force Office of Scientific Research; Human Frontiers of Science; Guggenheim Foundation; Graduate Women in Science; Grass Foundation Fellowships in Neurophysiology; MacArthur Foundation; National Environmental Research Council (United Kingdom); National Geographic Society; National Institutes of Health; National Sciences and Engineering Research Council (Canada); National Marine Fisheries Service Unallied Management Program; National Undersea Research Center; National Science Foundation (12 panels, including *Animal Behavior*, *Behavioral Neuroscience*, *Biological Basis of Behavior*, *Biological Field Stations and Marine Labs*, *Biological Physics*, *Biological Oceanography*, *Ecological and Evolutionary Physiology*, *Environmental Biology*, *Neuroscience*, *Organism and Environment Interactions*, *Physiology and Behavior*, *Sensory Systems*); Protect Wild Dolphins; Research Corporation; Royal Society Marsden Fund (New Zealand).

- ❖ **Endangered Species Research Applications**, including permits for National Marine Fisheries Service and Florida Fish and Wildlife Conservation Commission.

Scientific Society Memberships (Past and Present):

American Association for the Advancement of Science
American Association of University Professors
Animal Behavior Society
American Fisheries Society
International Brain Research Organization
International Society for Neuroethology
International Sea Turtle Symposium
Royal Institute of Navigation
Society for Integrative and Comparative Biology
Society for Neuroscience
Sigma Xi Scientific Society

Workshops and Symposia Organized:

Bio-Navigation Symposium, Institute of Navigation Annual Meeting; Cambridge, Massachusetts (2007)
Sea Turtle/Fish Sensory Biology Workshop for National Marine Fisheries Service; Chapel Hill, North Carolina (2005)

Selected University Service:

Advisory Board, Galapagos Science Center (2012 to present)
Fellow, UNC Center for Galapagos Studies (2010 to present)
Galapagos Science Center Steering Committee (2008-present)
UNC faculty delegation to Quito, Ecuador and the Galapagos Islands (May, 2008)
UNC Administrative Boards (2002-2005); reviewed all science classes for general education requirement
Adjunct professor, Department of Marine Sciences (1995 to present)
Member, Cognitive Science Program (1998 to present)
Member, Curriculum in Neurobiology (1994 to present)
Member, Biological and Biomedical Science Program

Selected Biology Department Service:

Chair, Development Committee (2014 to present)
Editor, Annual Department of Biology Newsletter (2014 to present)
Chair, Teaching Evaluation Committee for Promotion and Tenure (2011-2014)
Chair, Teaching Awards Committee (2009-2011)
Director of Graduate Admissions (2003-2008)
Chairman's Advisory and Planning Committee
Strategic Planning Committee (2005, 2011)
Committee on Organismic Biology