

# **Ecology of the Gulf of Maine: Marine Mammals, Sea Birds & the Marine Environment**

(General Interest or Academic Credits)

## **Course Description:**

*No prior knowledge in marine sciences is needed -- just the desire to learn.*

Learn, hands-on, about marine ecology, marine mammals, sea birds and more using the coastal marine ecosystem, concepts of marine mammal biology, the organisms that inhabit the coastal environment and techniques related to marine field research. Food chains, basic oceanographic concepts, animal behavior, general research methods, data assimilation and analysis, and technological applications will be studied.

Participants will also have the opportunity to learn elements of navigation, bathymetry, and wildlife photography while participating in a long-term study in marine mammal research with an established research organization.

Participants will participate in a 5-day course participating in established research program.

## **Students taking the course for academic credit will:**

- complete pre-project readings with an annotated bibliography,
- participate in a 5-day project, and
- complete a Final Product which relates directly to the focus of the program (Due by Oct. 1).

The Final Product may be one of the following: a teaching unit based on the readings and research experience, a research paper, an article based upon the experience submitted to a professional publication in its specified format. (**High School** student evaluation is to be determined by their respective teachers).

## **General Introduction to Topics**

### **Physical Concepts**

Water analysis techniques - Physical Properties of water

Water analysis techniques

Thermoclines, Haloclines, and Pycnoclines, and Water Dynamics

Temperature, Salinity and Density

(continued)

**Biological Concepts and Processes**

- Food Chains - coastal and marine
- Productivity and Biotic and Abiotic Factors
- Plankton collection, analysis, and identification
- Marine Environments
- Marine Mammals and Pelagic Bird Species
- Adaptations - Basic Anatomy and Physiology of Whales vs. Fish

**Marine Mammals/Whales**

- Characteristics of whale species

**Mysticetes and Odontocetes (Adaptations)**

- Echolocation, Communication and Sound
- Respiration
- Diving Reflex
- Migration
- Animal behavior
- Social Interaction
- Feeding and Reproduction

**Human Interaction and Influences on the Marine Environment**

- Fishing and Whale Watching
- Economic Status of Stellwagen Bank
- Entanglements
- Gill nets and harbor porpoise

**Methods of species and individual identification.**

- Whales, seals, and Birds

**Other skills include:**

- Navigation methods
- Data collection methods
- Photographic techniques
- Current research methods
- Intro to Water analysis techniques

**For Information and registration materials contact:**

**Instructors:**

<p><b>J. Michael Williamson,</b></p> <p>Associate Professor, Director WhaleNet          Email: <a href="mailto:mwilliamson@wheelock.edu">mwilliamson@wheelock.edu</a>          Phone: 978-468-4699          Fax: 978.468.0073          Address: 20 Moynihan Rd.,          South Hamilton, MA 01982</p>	<p><b>Scott Mercer</b></p> <p>Naturalist, Author and Instructor UNH          Email: <a href="mailto:whalesealstudy@aol.com">whalesealstudy@aol.com</a>          Phone: 207-361-1605</p>
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## **The Instructors:**

### **Scott Mercer**

Studied marine mammals since the 1970s. Studied marine mammals in the Pacific Ocean, Canadian Maritimes, Gulf of Maine, and the Western North Atlantic.

Scott has taught at the middle school, high school, adult education, and college levels.

Author of three books: *The Great Whale Book*, *Whalehead Nation: Creating and Keeping An Environmental Ethic In Children*, and *Tribes, A Collection Of Poems*. He also wrote several magazine articles and has presented at scientific conferences. He is Co-founder of the Brier Island (Nova Scotia) Research Station and Brier Island Ocean Study, served on the board of directors of several nonprofit organizations. He is Founder of New England Whale Watch, Inc. Major Contributor to the Finback, Humpback, and North Atlantic Right Whale Catalogs of Identified Individuals. Online scientist in WhaleNet's ASK the Scientist program. He was also the editor of the Newsletter of The North Atlantic Marine Mammal Association.

### **Michael Williamson**

Michael founded WhaleNet in 1993 to excite students about math, science, the environment and technology ([articles](#)). His extensive involvement in marine science and education helped inspire this project. Williamson is an Associate Professor of Science at Wheelock College in Boston, Massachusetts, where he has taught marine biology, oceanography, physical science, ecology, and mathematics courses since 1988.

Williamson's memberships have included the Stellwagen Bank National Marine Sanctuary Advisory Council, the Education Advisory Committee for the *Sustainable Seas Expedition* (NOAA & National Geographic Society), the Society of Marine Mammology, the Marine Technology Society, the Massachusetts Marine Educators, and the National Science Teachers Association, and is the Associate Director of the [Mingan Island Cetacean Study](#). He was also a pioneer in Massachusetts whale research as the former director of the Pelagic Systems Research/Massachusetts Whale Watch, which began studying cetaceans in Massachusetts Bay in 1976.

[Michael Williamson](#) is a member of Sigma Xi, The Scientific Research Society, a non-profit membership society of more than 60,000 scientists and engineers who were elected to the Society because of their research achievements or potential.