



**Undergraduate Program**

Ecological Technology Design  
Ecosystem Health  
Soil and Watershed Science  
Natural Resources Management

**Graduate Program**

Soil and Watershed Sciences  
Ecological Technology Design  
Wetland Science  
Ecosystem Health & Natural Resource Management



# Using Wildlife to Monitor the Health of the Environment

*Professor William Bowerman has been working with bald eagles and other birds of prey, for over 27 years. He brings his experience with water quality monitoring and effects of climate change on wildlife from the Great Lakes to the Chesapeake Bay.*

## Wildlife as Sentinels

Bald eagles and other sea eagles, are the top-level predator of aquatic food webs. For environmental pollutants, they accumulate great amounts of these substances in their bodies and many times, show the greatest effects from these chemicals. Sea eagle monitoring programs have been initiated in the U.S., Canada, Sweden, Russia, Uganda, and South Africa. Well over 300 scientists have been trained in our methods. Samples are taken from adults, nestlings, and unhatched eggs are collected. Both spatial and temporal trends tell us about the success of remediation activities, and identify both areas of concern and new and emerging chemicals.

## Indicators of Global Climate Change

Dr. Bowerman has recently been using the long-term bald eagle population in the Great Lakes to look at effects of global climate change. Eagles nesting along the Great Lakes shorelines have shown a significant trend of nesting earlier each year. This is one of the greatest changes observed in nesting chronology in the world for a bird. In addition, he is examining size changes in nestlings as another possible indicator of impacts of a warming climate.

## Research Benefits

- A sentinel of the impacts of human activities on the aquatic environment
- A sentinel of the impacts of global climate change
- An understandable illustration of both chemical effects and global climate change
- Humans relate to eagles and have a common knowledge that man's impacts do affect the environment, and that positive changes in our activities can show improvement in the environment

## Water Quality and Endangered Species

Dr. Bowerman has extensive expertise in multi-jurisdictional water quality issues, and currently serves as the U.S. Co-chair of the Great Lakes Science Advisory Board of the International Joint Commission. He has worked on indicators of Great Lakes water quality, Lakewide Management Plans, and remediation of Areas of Concern. He has worked on the effects of environmental contaminants on individuals, populations, and ecosystems, including the effects of endocrine disruptors on wildlife health. He has also served on the Northern States Bald Eagle Recovery Team of the U.S. Fish and Wildlife Service.