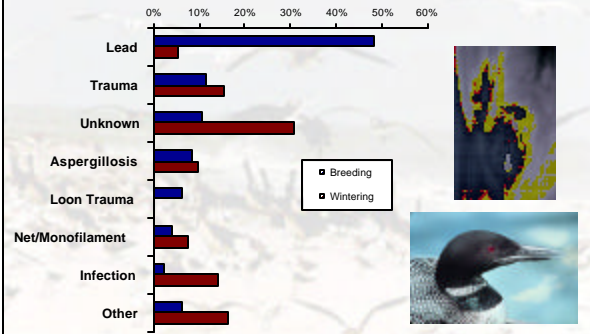


SEANET: A Citizen Science Initiative for Coastal and Marine Ecosystem Health



Becky Harris, PhD, Mark Pokras, DVM, Flo Tseng, DVM, Beth Suedmeyer, MS
 Tufts Wildlife Clinic and Tufts Center for Conservation Medicine
 Tufts Cummings School of Veterinary Medicine

Causes of mortality in breeding and wintering adult loons (~1000)



SEANET Overview

- Network of researchers & citizen scientists
 - 60+ collaborating organizations
 - 300 volunteers
- Database & GIS maps of seabird information and internet mapping/reporting system
 - With NWHC <http://wildlifedisease.nh.gov/seanet>
 - member of Gulf of Maine Marine Data Partnership
 - Census of Marine Life Gulf of Maine working group



Some SEANET Collaborators

Non-profit Organizations

- MA Audubon Society
- The Lloyd Center
- Wildlife Trust
- Manomet Center for Conservation Science
- Bird Studies Canada
- Maine Audubon
- CT Audubon
- NYC Audubon
- The Nature Conservancy
- The Wetlands Institute
- QLF / Atlantic Center for the Marine Environment

State Agencies

- MA Division of Fisheries & Wildlife
- MA Dept of Coastal Zone Management
- NH Dept. of Fish and Game
- NY State Parks Department

Partnerships

- Census of Marine Life / Gulf of Maine Marine Data Partnership
- North American Waterbird Conservation Plan

Universities

- Stockton State College
- Antioch New England
- University of Connecticut
- University of South Florida
- University of New Hampshire

Wildlife Rehabilitators

- TriState Bird Research & Rescue
- Wildlife Rescue Center of the Hamptons
- Volunteers for Wildlife
- Riverhead Foundation
- Cape Wildlife Center
- Wild Care
- ReMaine Wild

Federal Agencies

- US Fish & Wildlife Service
- National Park Service
- US Environmental Protection Agency
- NOAA Fisheries
- National Biological Information Infrastructure, USGS, National Wildlife Health Center

Beached Bird Surveys

- Baseline mortality data
- Extension of other efforts (Canada)
- Detection of threats:
 - Harmful algal blooms
 - Contaminant patterns
 - Oil and chemical spills
 - Disease outbreaks
 - Fisheries bycatch
 - Wind farms?
 - Climatic change?
- Involvement of volunteers, school science classes



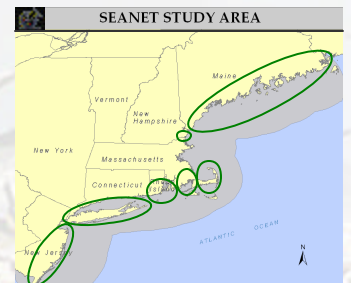
Network of Volunteer Monitors

Currently 300+ volunteers!

Atlantic Canada

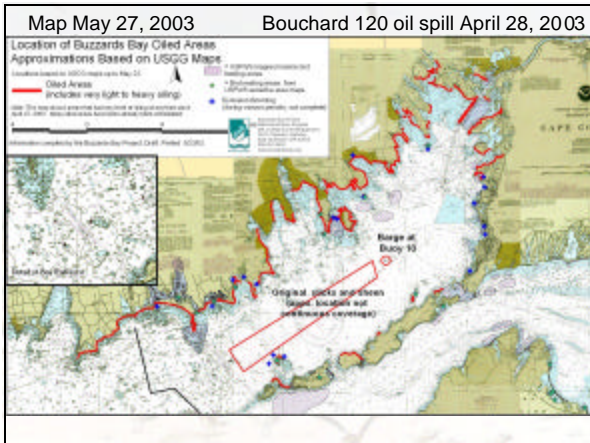
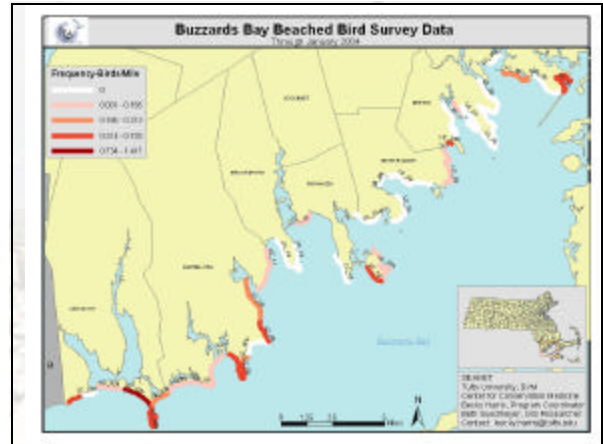
- QLF
- CWS
- Bird Studies Canada

→ Atlantic Coast field guide



SEANET Overview: Education and Outreach

- Over 70 public presentations given
scientific meetings, volunteer groups, high schools
- Student involvement
over 30 veterinary students, undergraduates, and graduate students involved
- At least 20 stories in various media outlets
- Symposium at PSG/Waterbirds Annual meeting:
"Beached bird surveys: lessons to learn – past, present, and future" 15 presenters from 6 countries
- Distributed internet mapping
public access to internal and external data in progress



SEANET Applications: oil spill damage assessment

Bouchard oil spill birds

- necropsies in collaboration with US EPA
- tissues saved for analysis



SEANET Applications: oil spill damage assessment

Chronic, sublethal effects of oil on terns

Baseline Demographic Variation

- tern populations have been studied in Buzzards Bay since 1970
- demographic parameters used in natural resource damage assessments

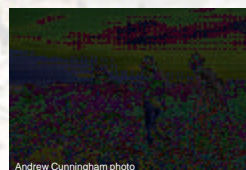
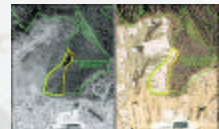
Physiological Parameters

- Hematological parameters can indicate:
- natural variation in environmental quality
 - pathological changes induced by hydrocarbon exposure
 - may co-vary with demographic parameters



SEANET Applications: oil spill restoration

- Volunteers' live bird observations used for prioritization of wetlands acquired in settlement



Andrew Cunningham photo

SEANET Applications: contaminants

Baselines

- birds caught as fisheries bycatch

Biotoxins

- marine biotoxin levels in tissues during HAB events / reference baselines



Heavy Metals

- freshwater / marine, different species groups
- archived tissues, feathers, eggs...

Persistent Organics

- cholinesterase assays, pesticide residues (Maine Avian Health Surveillance Project, Manomet)
- archived tissues, feathers, eggs...

SEANET Applications: mortality events

- 2002- 2004: multiple tern hatchling and fledgling die-offs in the Gulf of Maine

- 2004: gull chicks dying on Appledore Island, Isles of Shoals

- 2004: ~2,025+ common tern fledglings dying on South Monomoy Island, Chatham, MA – neurologic signs, salmonellosis, undescribed infectious agent?



pathogens/contaminants/food - interactions??



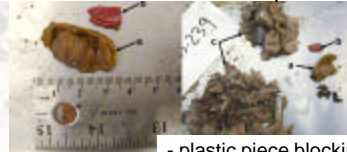
SEANET Applications: marine debris

- Northern gannet on Cape Cod



- plastic bottle cap, lesions in gizzard

- Greater shearwater on Cape Cod

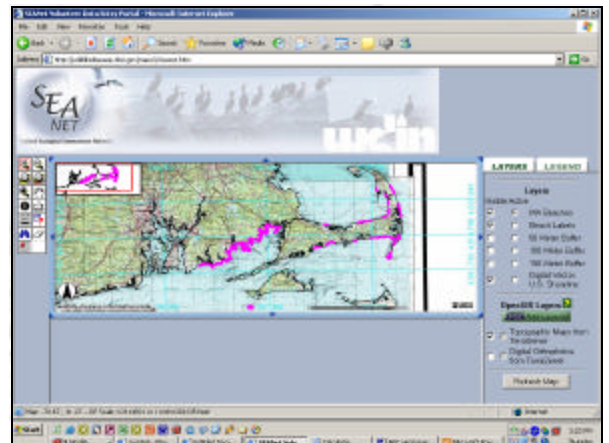


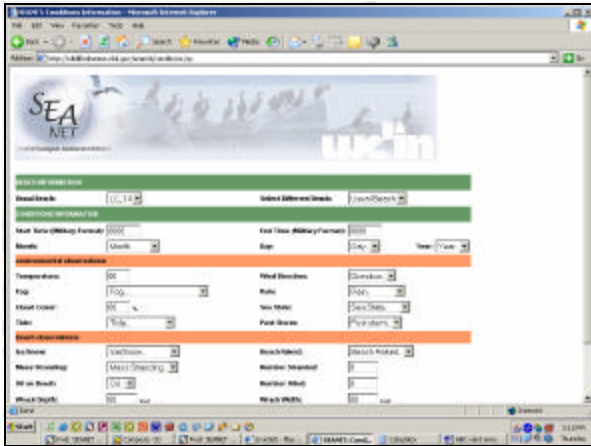
- plastic piece blocking the gizzard

SEANET Applications: broader implications for marine ecological health monitoring

• marine mammals and sea turtles

- stranding networks – mortality events across taxa
- shared pathogens and parasites – acanthocephalans
- marine biotoxins





SEANET Summary



- Valuable collaborations
 - community
 - research community
 - management agencies
 - wildlife rehabilitators
 - sample archives



- Outreach
- Public policy
- Educational opportunities

SEANET funding sources

- Geraldine R. Dodge Foundation
- Lynn Trayser Mitchell Memorial Bird Fund
- Massachusetts Environmental Trust
- Gulf of Maine Council
- National Fish and Wildlife Foundation
- The Fuller Foundation
- International Fund for Animal Welfare
- NOAA Coastal Services Center
- Davis Conservation Foundation

And many thanks to all volunteers and collaborators!