

Oceans and Human Health Initiative

**Interdisciplinary Research & training Initiative on Coastal ecosystems
& Human Health (I-RICH)**

A Partnership Among:

University of Connecticut

Mystic Aquarium & Institute
for Exploration

NOAA/NMFS/NFSC
Milford Laboratory



Collaborating Principal Investigators:

1. University of Connecticut, Department of Marine Sciences
J. Evan Ward, Ph.D. (evan.ward@uconn.edu)
Hans Dam, Ph.D. (hans.dam@uconn.edu)
2. University of Connecticut, Department of Pathobiology
Sylvain DeGuise, D.M.V., Ph.D. (sylvain.Deguisse@uconn.edu)
Salvatore Frasca, V.M.D., Ph.D. (salvatore.frasca@uconn.edu)
3. Mystic Aquarium and Institute for Exploration
Tracy Romano, Ph.D. (tromano@MysticAquarium.org)
4. NOAA, National Marine Fisheries Service, Northeast Fisheries Science Center
Gary Wikfors, Ph.D. (gwikfors@clam.mi.nmfs.gov)

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Summary

Healthy coastal ecosystems are essential for the survival and prosperity of human populations. The organisms that reside in these ecosystems, i.e., living marine resources (LMR), provide employment, revenue, recreation and food to people worldwide. Unfortunately, human activities are having profound impact on many coastal systems. For example, anthropogenic perturbations have been implicated in increasing the spread of invasive species, stimulating the range and abundance of disease-causing agents, increasing the spread and frequency of occurrence of harmful-algal blooms, and directly contaminating habitats with various pollutants. These impacts cause a cascade of events leading to, for example, habitat degradation, reduction of ecosystem services, and loss of species diversity. In addition, as coastal ecosystems degrade, feedback consequences arise, such as decline in the abundance and safety of seafood, that negatively impact humans (Table 1, Fig. 1). We propose to develop an interdisciplinary graduate training and post-doctoral mentoring initiative that builds on our current academic and research strengths which focus on major problems impacting coastal ecosystems. Specifically, I-RICH will include a broad base in marine sciences, coupled with specific training in one of three focus areas which represent critical problems in the coastal zone that impact LMRs (e.g., fish, shellfish, marine mammals). These focus areas have been chosen based on current expertise of our faculty and collaborating scientists and include: 1) impacts/consequences of harmful algal blooms (HABs), 2) marine diseases and pathogens, and 3) emerging pollutants such as nanoparticles (Fig. 2). I-RICH will include education, research, and outreach components, and is based on two fundamental principles: 1) The land, sea, and atmosphere are inextricably connected and human perturbations of one Earth system will often affect another (Preliminary report, US COP 2004); and 2) In order to fully understand the manifold of effects that human activities have on coastal ecosystems and the cascade of consequences they initiate, interdisciplinary research and training programs must be developed. The goal of this initiative is to provide human resources and information that will address and shape responses to pressing coastal management problems related to LMR, seafood safety and human health. Our initiative will help train the next generation of scientists who will work in the important field of oceans and human health.

Table 1. Some impacts of human activities on coastal ecosystems and their concomitant consequences.

Human perturbations can lead to the following impacts:

1. Spread of infectious diseases of aquatic plants and animals
2. Spread of harmful algal blooms
3. Input of pollutants
4. Loss of habitat and species diversity

Feedback consequences of degraded ecosystems on humans include:

1. Health risks from eating contaminated aquatic foods
2. Health risks from exposure to contaminated waters
3. Economic losses from collapse of local fisheries (recreational and commercial)
4. Reduction in ecosystem services by ecologically important species

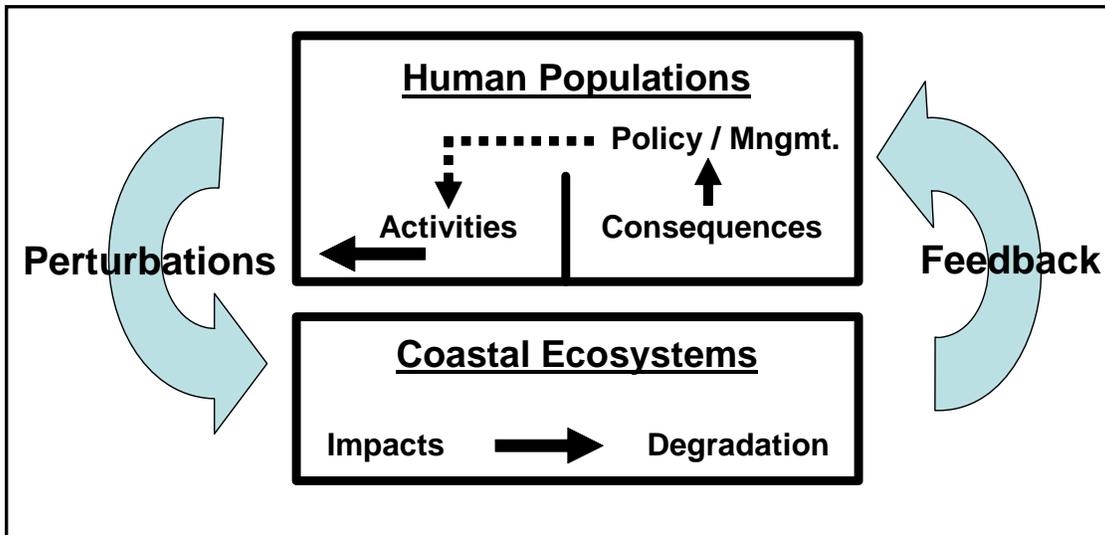


Figure 1. Linkages between human populations and coastal ecosystems. Research and training efforts will focus on perturbations, impacts, and feedback consequences.

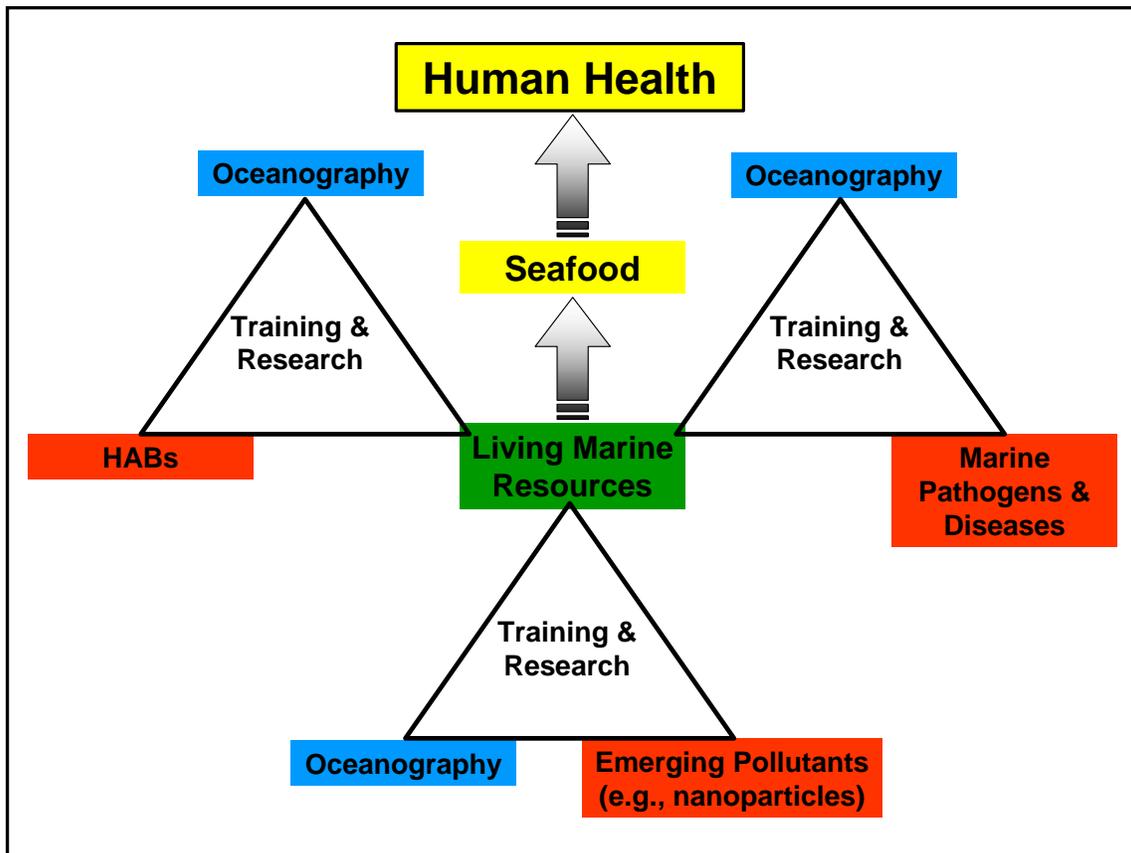


Figure 2. Graduate students & post-doctoral fellows within I-RICH will receive broad training in marine sciences (oceanography & marine biology) and specific training in one of several focus areas: HABS, Marine Pathogens/Diseases, Pollutants. Advisory committees will be formed from faculty in these departments and scientists from collaborating institutions. Interdisciplinary research and training components will be supported and facilitated by several Centers within UConn (see text for full details).