**Student Name**

**Student ID Number**

**English 302**

**ICW Part 1 Discipline Specific Resources (Weeks 4-5)**

**1**. Visit <http://infoguides.gmu.edu/><http://library.gmu.edu/tutorials>

Professional association

* American Public Health Association (APHA)
* Centers for Disease Control and Prevention (CDC)
* Health Resources and Services Administration (HRSA)
* National Center for Biotechnology Information (NCBI)
* National Institutes of Health (NIH)
* National Oceanic and Atmospheric Administration (NOAA)
* National Occupational Health Services (NOHS)

Discipline specific database

* *Agriculture Science Database*
* *Biological Science Database*
* *Cambridge University Press Journals*
* *Environmental Science Collection*
* *PubMed Central*
* *Materials Science Collection*
* *Medline Database*
* *Ocean Health Index*
* *PubMed Central*
* *Social Science Database*

Academic journal (peer-reviewed)

* *American Fisheries Society (AFS)*
* *Environmental Health Perspectives*
* *Environmental Practice*
* *Marine Pollution Bulletin*
* *Microbial Ecology*
* *PLoS One*

Trade publications

* *Aquatic Conservation: Marine and Freshwater Ecosystems*
* *Biogeosciences (BG)*
* *Biological Conservation*
* *The Biological Bulletin*
* *Journal of the International Coral Reef Societ*
* *Deep-Sea Research Pat I: Oceanographic Research Paper*
* *Deep-Sea Part II: Topical Studies in Oceanography*
* *Earth and Planetary Science Letters*
* *Environmental Pollution*
* *The Biological Bulletin*

Gray literature (by and for professionals) (annual report, policy report, internal documents)

* American Fisheries Society
* National Institutes of Health
* Centers for Disease Control and Prevention
* National Institutes of Health
* Smithsonian Ocean

**2.** Visit the website of a professional association you have identified.

National Oceanic and Atmospheric Administration:

* Mission statement:

1. To understand and predict changes in climate, weather, oceans and coasts;
   * Science at NOAA is the systematic study of the structure and behavior of the ocean, atmosphere, and related ecosystems; integration of research and analysis; observations and monitoring; and environmental modeling. NOAA science includes discoveries and ever new understanding of the oceans and atmosphere, and the application of this understanding to such issues as the causes and consequences of climate change, the physical dynamics of high-impact weather events, the dynamics of complex ecosystems and biodiversity, and the ability to model and predict the future states of these systems. Science provides the foundation and future promise of the service and stewardship elements of NOAA’s mission.
2. To share that knowledge and information with others;
   * Service is the communication of NOAA’s research, data, information, and knowledge for use by the Nation’s businesses, communities, and people’s daily lives. NOAA services include climate predictions and projections; weather and water reports, forecasts and warnings; nautical charts and navigational information; and the continuous delivery of a range of Earth observations and scientific data sets for use by public, private, and academic sectors.
3. To conserve and manage coastal and marine ecosystems and resources.
   * Stewardship is NOAA’s direct use of its knowledge to protect people and the environment, as the Agency exercises its direct authority to regulate and sustain marine fisheries and their ecosystems, protect endangered marine and anadromous species, protect and restore habitats and ecosystems, conserve marine sanctuaries and other protected places, respond to environmental emergencies, and aid in disaster recovery. The foundation of NOAA’s long-standing record of scientific, technical, and organizational excellence is its people. NOAA’s diverse functions require an equally diverse set of skills and constantly evolving abilities in its workforce.

Also underlying NOAA’s continued success is its unique infrastructure. NOAA’s core mission functions require satellite systems, ships, buoys, aircraft, research facilities, high-performance computing, and information management and distribution systems. The agency provides research-to-application capabilities that can recognize and apply significant new understanding to questions, develop research products and methods, and apply emerging science and technology to user needs. NOAA invests in and depends heavily on the science, management, and engagement capabilities of its partners. Collectively, NOAA’s organizational enterprise-wide capabilities — its people, infrastructure, research, and partnerships — are essential for NOAA to achieve its vision, mission, and long-term goals.

* Publications:
  + NOAA Technical memorandum NWS CR
  + Southeast Fisheries Science Center (SEFSC)
  + Northeast Fisheries Science Center (NEFSC)
  + Office of Sustainable Fisheries (OSF)
* Topics of recent articles and conferences:
  + Featured topics include earth’s climate change
  + Preparing and anticipating Arctic changes
  + Preserving corals
  + Battling wildfires
  + National Ocean Service Annual Report
  + Fisheries Stories
* Values and current concerns of this discourse community:
  + Build on a foundation of science
  + Use of knowledge to protect people and the environment
  + Understanding the Ocean and the environment
  + Climate predictions and projections
  + Integration of research and analysis
  + Protect endangered marine and anadromous species
  + Lead by example
* Recent research:
  + Heat-stressed corals
  + Meteorologists helping battle Australia’s wildfires
  + Can we clean up, stop or end harmful algal bloom?
  + The invasive turkeyfish: To beat it, try eating it
  + NOAA steps up effort to move new ideas from lab to marketplace
  + From hurricanes to seal pups: 4 ways drones are helping NOAA scientists conduct research

**3.** Write out your research question and identify potential search terms.

* Research questions
  + What is the relationship between the marine life and public health?
  + How does marine pollution effect public health?
  + Does marine life benefit the medical field?
* Search Terms
  + Public Health
  + Human Health
  + Community Health
  + Ocean Science
  + Marine Science
  + Improve
  + Evidence
  + Environmental
  + Chemical Pollution
  + Red Tides
  + Medical
  + Harmful Algal Bloom
  + Tilapia Skin
  + Blue Blood
  + Horse-Shoe Crabs

1. Begin your annotated bibliography.

(Down at the bottom of the page)

1. Use your notes to write a paragraph answering the following questions:

The oceans’ marine ecosystem has a strong link to public health. The ocean provides sources of food, nutrients, medicine, drinking water, pathogens and most importantly absorbs carbon dioxide from the atmosphere to reduce climate change impacts and regulate it. However, the relationship between marine ecosystems and humans can have both positive and negative impacts on one another. For instance, algal blooms are a rapid growth of microscopic algae or cyanobacteria in water and as more algal grows other plants die. Algal blooms are not always harmful but due to the toxins they produce or from using up oxygen in the water, they can lead to fish die-offs, an unpleasant odor and a bad taste which can affect drinking water and cause nutrient pollution. Also, some human activities such as pollution and overfishing, negatively impact the marine ecosystem. Overfishing results in a disruption to the entire food chain, thus negatively impacting human health. Water pollution with plastic, oils, chemicals and other toxic substances are harmful to not only marine life but also humanity. Plastic kills marine animals, destroys habitats and can even affects animals' mating rituals, which can result in the extinction of an entire species as well as alterations to the ecosystem that affect nutrients, and proteins that humans consume. In addition, marine ecosystems play a crucial part in providing medicine in contribution to human health, particularly in traditional Asian and Indian medicine. According to the NOAA; while most drugs derived from natural sources come from terrestrial organisms, research suggests that marine invertebrates produce more antibiotic, anti-cancer, and anti-inflammatory substances than any group of terrestrial organisms. Some chemicals produced by marine animals that may be useful in treating human diseases include; Ecteinascidi which is extracted from tunicates; being tested in humans for treatment of breast and ovarian cancers and other solid tumors. Discodermalide which is an anti-tumor agent. Bryostatin which is a potential treatment for leukemia and melanoma. Pseudopterosins which is an anti-inflammatory and analgesic agent that reduces swelling and skin irritation and accelerates wound healing. And a potent pain-killer is w-conotoxin MVIIA, extracted from the cone snail.

When choosing the articles for my annotated bibliography, I found an overwhelming amount of articles about the ocean, which I found surprising since scientists estimate that less than 5% of the ocean has been explored.I narrowed down my search by making the linkage between marine ecosystems and human health. It is a very broad topic to narrow, human health and ocean health is the main objective. Most of the articles are related to either marine life’s health, the affects of human activity of marine life, the benefits of marine life to human health and the connection between them. This simplified my research to obtain the information need and tie it together.

**References**

**Ackerman, D. (2018, October 17). This Chemical Turns Polluted Green Lakes Clear. Is it Safe? Retrieved from** [**https://www.nationalgeographic.com/environment/2018/10/aluminum-sulfate-clears-polluted-lakes-algae-blooms/**](https://www.nationalgeographic.com/environment/2018/10/aluminum-sulfate-clears-polluted-lakes-algae-blooms/)

**Berdalet, E., Fleming, L. E., Gowen, R., Davidson, K., Hess, P., Backer, L. C., Moore, S. K., Hoagland, P., & Enevoldsen, H. (2015). Marine harmful algal blooms, human health and wellbeing: challenges and opportunities in the 21st century. *Journal of the Marine Biological Association of the United Kingdom. Marine Biological Association of the United Kingdom*, *2015*, 10.1017/S0025315415001733.** [**https://doi.org/10.1017/S0025315415001733**](https://doi.org/10.1017/S0025315415001733)

This article has significance due to the direct reference it holds towards the tie between ocean and human health. The article explains what microalgal blooms are and their relevance benefits as well as addressing the negative impact of the harmful algal blooms (HABs). It also speaks on the impact of global warming and other changes that affect HAB occurances and toxicity which in turn affects human health. When compared to other references, it addresses a global challenge that includes more specific in-depth scientific research about harmful algal blooms. This article will be used to provide an overview of different aspects of the HABs natural phenomena, an important element of the intrinsic links between oceans and human health and wellbeing.

**Chemical Pollution. (n.d.). Retrieved from** [**http://www.oceanhealthindex.org/methodology/components/chemical-pollution**](http://www.oceanhealthindex.org/methodology/components/chemical-pollution)

**Do medicines come from the sea? (n.d.). Retrieved from https://oceanexplorer.noaa.gov/facts/medicinesfromsea.html**

**Hakim, Raymond M,M.D., PhD., Breillatt, J., PhD., Lazarus, J. M., & Port, Friedrich K,M.D., M.S. (1984). Complement activation and hypersensitivity reactions to dialysis membranes.*The New England Journal of Medicine, 311*(14), 878-882. doi:http://dx.doi.org.mutex.gmu.edu/10.1056/NEJM198410043111403**

**Hall, D. (2018, December 27). What Exactly Is a Red Tide? Retrieved from** [**https://ocean.si.edu/ocean-life/plants-algae/what-exactly-red-tide**](https://ocean.si.edu/ocean-life/plants-algae/what-exactly-red-tide)

**Halpern, B. S., Longo, C., Hardy, D., McLeod, K. L., Samhouri, J. F., Katona, S. K., . . . Zeller, D. (2012). An index to assess the health and benefits of the global ocean.*Nature, 488*(7413), 615-620. doi:http://dx.doi.org.mutex.gmu.edu/10.1038/nature11397**

This writing provides an overview on the role that the ocean plays in supporting human health and life. From the article, specific human activities such as overfishing, pollution and costal development are highlighted as they alter the marine ecosystemthus negatively impacting human health. This article offers insight into sustainable management aimed at maintaining human and ocean health through comprehensive and quantitative methods. This paper is critical since it provides evidence-based statistics and proposals on this topic. When compared to other articles, this piece delivers powerful data to raise public awareness, improve methods and prioritize the public’s health. This will be used to link marine ecosystem to community health and understand the relationship between the two.

**Harmful Algal Blooms & the Environment. (2017, December 12). Retrieved from https://www.cdc.gov/habs/environment.html**

**Howard, J. (2019, July 5). Red tides, explained. Retrieved from** [**https://www.nationalgeographic.com/environment/oceans/reference/red-tides/#close**](https://www.nationalgeographic.com/environment/oceans/reference/red-tides/#close)

**Hudnell, H. (2010). The state of U.S. freshwater harmful algal blooms assessments, policy and legislation. *Toxicon*, *55*(5), 1024–1034. https://doi.org/10.1016/j.toxicon.2009.07.021**

**Kite-Powell, H. L., Fleming, L. E., Backer, L. C., Faustman, E. M., Hoagland, P., Tsuchiya, A., Younglove, L. R., Wilcox, B. A., & Gast, R. J. (2008). Linking the oceans to public health: current efforts and future directions. *Environmental health : a global access science source*, *7 Suppl 2*(Suppl 2), S6.** [**https://doi.org/10.1186/1476-069X-7-S2-S6**](https://doi.org/10.1186/1476-069X-7-S2-S6)

We review the major linkages between the oceans and public health, focusing on exposures and potential health effects due to anthropogenic and natural factors including: harmful algal blooms, microbes, and chemical pollutants in the oceans; consumption of seafood; and flooding events. We summarize briefly the current state of knowledge about public health effects and their economic consequences; and we discuss priorities for future research.

We find that:

• There are numerous connections between the oceans, human activities, and human health that result in both positive and negative exposures and health effects (risks and benefits); and the study of these connections comprises a new interdisciplinary area, "oceans and human health."

• The state of present knowledge about the linkages between oceans and public health varies. Some risks, such as the acute health effects caused by toxins associated with shellfish poisoning and red tide, are relatively well understood. Other risks, such as those posed by chronic exposure to many anthropogenic chemicals, pathogens, and naturally occurring toxins in coastal waters, are less well quantified. Even where there is a good understanding of the mechanism for health effects, good epidemiological data are often lacking. Solid data on economic and social consequences of these linkages are also lacking in most cases.

• The design of management measures to address these risks must take into account the complexities of human response to warnings and other guidance, and the economic tradeoffs among different risks and benefits. Future research in oceans and human health to address public health risks associated with marine pathogens and toxins, and with marine dimensions of global change, should include epidemiological, behavioral, and economic components to ensure that resulting management measures incorporate effective economic and risk/benefit tradeoffs.

This article is centered around the oceans connection to public health on multiple levels. It explains how human health can be affected by the oceans conditions and phenomena in negative and positive ways. It makes it clear that human health and marine ecosystems depend on one another in several ways. This evidence-based paper significance includes the authors’ linkages between oceans and public health by highlights recent research on this topic, and suggesting possible priorities for future work in this area. This is similar to the article published by *Nature* as they both identify the importance of marine life in regards to community health as well as identify the problems arising from the negative impact of human activities. This resource is particularly useful with regard to establishing the necessary framework for minimizing the negative health impacts on human health as well as maximizing the benefits of marine ecosystems by raising awareness.

**Sindermann, C., &Sindermann, C. (2006). *Coastal pollution effects on living resources and humans*. Boca Raton, FL: CRC/Taylor & Francis. https://doi-org.mutex.gmu.edu/10.1201/9781420036411**

**Trevino-Garrison, I., Dement, J., Ahmed, F., Haines-Lieber, P., Langer, T., Menager, H., … Carney, E. (2015). Human Illnesses and Animal Deaths Associated with Freshwater Harmful Algal Blooms-Kansas. *Toxins*, *7*(2), 353–366. https://doi.org/10.3390/toxins7020353**

**US Department of Commerce, & National Oceanic and Atmospheric Administration. (2019, April 10). Harmful Algal Blooms (Red Tide). Retrieved from** [**https://oceanservice.noaa.gov/hazards/hab/**](https://oceanservice.noaa.gov/hazards/hab/)

**Walls, E., Berkson, J., & Walls, E. (2003). Effects of blood extraction on horseshoe crabs (Limulus polyphemus). *Fishery Bulletin*, *101*(2), 457–459. Retrieved from http://search.proquest.com/docview/18844549/**