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## **A Comparative Review of Marine Protected Areas in the U.S.A. and Italy**

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# A Comparative Review of Marine Protected Areas in the U.S.A. and Italy

by

**Clare Edens Crenshaw**

An Honors Capstone

submitted in partial fulfillment of the requirements

for the Honors Diploma

to

The Honors College

of

The University of Alabama in Huntsville

May 8, 2020

Honors Capstone Director: Dr. Bruce Stallsmith

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Clare Crenshaw

Student Name (printed)



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5/8/2020

Date

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### **Dedication**

I would like to dedicate this thesis to my family and friends who supported and motivated me to complete my Honors Diploma. I would also like to acknowledge Dr. Bruce Stallsmith and Domenico “Mimi” Sgambati, who helped me explore my academic and professional interests in the field of marine science both domestically and abroad. Without this support system, my experiences and accomplishments would not have been possible. Also, I would like to thank the Dauphin Island Sea Lab, Sant’Anna Institute, and the Punta Campanella Marine Protected Area for providing me with the most beautiful classrooms: our world’s oceans.

## **Abstract**

Coastal resource management (CRM) can be defined as actions that accomplish sustainable use and management of both economically and ecologically valuable resources in coastal areas which also take into account the complex interactions among and within resource systems, as well as with humans. It is an inherently participatory and interdisciplinary field, encompassing various fields such as ecology, economics, and social science. One main aspect of CRM is the implementation of marine protected areas (MPAs), which has been widely accepted across the globe as a great tool for conservation of marine resources and an important component of a comprehensive management approach. Through a review of MPA history, development, and status in the U.S. and Italy, I seek to understand and explain similarities and differences through connections to the characteristics of each country, like ecological structure, social support, and governmental regulations.

## **Introduction: What are Marine Protected Areas?**

### **Broadly Defined**

Marine protected areas are increasingly recognized by the U.S. and other nations around the globe as important tools for conserving and using marine resources in a sustainable way. Despite their widespread application and use, marine protected areas are widely defined and misunderstood. The International Union for Conservation of Nature (IUCN) defines a protected area as “a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values” (9). Therefore, MPAs are protected areas that include the marine environment and biodiversity.

Countries such as the U.S. and other nations consider the IUCN classifications to be the global standard for defining protected areas (6). However, many countries, including the U.S. and Italy, have their own definitions, classifications, and processes for MPAs. There are countless reasons for conserving marine resources, from protecting economically valuable resources, conserving biodiversity, and protecting species. MPAs can refer to marine reserves, no-take zones, marine sanctuaries, wildlife refuges, fishery closures, to name a few (10). Each type of MPA varies in characteristics such as level of protection and the types of permitted or non-permitted activities within their boundaries.

### **How Can MPAs Help?**

The wellbeing of our oceans is being threatened by a variety of factors, such as pollution and marine litter, overfishing, and offshore drilling. These threats destabilize the marine ecosystems, making them less resilient to climate change. MPAs provide protection and areas of

reduced stress for countless species, which increases species survival and improves species' ability to adapt to climate change (10). MPAs are also a valuable tool against carbon emissions, as they can protect carbon sequestration habitats such as mangroves, salt marshes, and seagrass meadows from degradation and destruction. This not only prevents carbon emission into the atmosphere, but they stimulate new carbon sequestration by restoring degraded coastal environments.

MPAs not only protect the marine environment, but they also help protect coastal communities. For instance, MPAs that protect coastal habitats such as barrier islands, coral reefs, mangroves and wetlands reduce human vulnerability in the face of climate change and provide the natural storm protection on which people rely (10). Also, MPAs help maintain local cultures, economies, and livelihoods which are intricately linked to the marine environment. By providing species a safe place to reproduce and grow, there is an increase in size and quantity of fish catches in surrounding fishing grounds. Humans rely on the marine and coastal environment for a variety of resources and activities and maintaining the health and natural heritage of our oceans ensures the continuation of these benefits.

### **Effective MPAs**

The IUCN protected area definition is intended to make it difficult for regions prone to resource exploitation to become MPAs, which helps ensure that MPAs are effective (9). Factors such as illegal harvesting, lax regulations that allow detrimental activities, and ill-considered geographic boundaries often cause MPAs to fail to reach their full potential. When planning an MPA, it is essential to have in-depth knowledge of the area to define its ecological boundaries and protection objectives. However, during the planning, implementing, and managing stated of

MPA development, it is important to pay attention to all aspects that influence MPA performance, including both biological and human dimensions. Social, economic, and institutional factors can dramatically affect the outcome of MPA implementation, so public support and compliance is essential to an effective MPA, as even the strictest regulations are ineffective if the public does not adhere to them. Organizations such as the World Wide Fund and the IUCN are dedicated to increasing public and political support of MPAs (8). According to the IUCN, most existing MPAs do not have enough human and financial resources to properly implement conservation and management measures (10).

### **MPAs Across the Globe**

MPAs that are connected to one another either ecologically or socially are called a network, which is intended to promote education and cooperation between administrations. The IUCN reports that the global MPA network currently protects 6.35% of the ocean, but only just over 1.89% is covered by exclusively no-take MPAs. No-take MPAs are regions that prohibit all extractive activities, such as fishing, mining, and drilling. The current status of the global MPA network is far from the commitments made to the Convention on Biological Diversity's (CBD) Aichi Target 11 of 10% MPA coverage by 2020, and even further from the recommendations made at the IUCN World Parks Congress 2014 that at least 30% no-take MPA coverage worldwide is needed. The fact that seven countries account for 80% of the surface area of MPAs further demonstrates the divide in marine protection in the global network (10).

## **Chapter 1: MPAs in the U.S.A.**

### **American Coastal Life**

The United States has the world's largest Exclusive Economic Zone, which supports an enormous biodiversity and wealth of life in coastal, marine, and Great Lakes waters (6). According to NOAA, over 127 million people live in the coastal counties of the U.S., which is almost 40 percent of the nation's total population, yet the coast accounts for less than 10 percent of the nation's land mass (excluding Alaska). Coastal areas are significantly more crowded than the U.S. overall, and the population density of coastal shoreline counties is over six times greater than the corresponding inland counties. Annually, coastal counties produce more than \$8.6 trillion in goods and services, employ 56.8 million people, and pay \$3.5 trillion in wages (5). Many of these jobs and services are dependent on the support of a healthy marine ecosystem, so these stakeholders are often involved in the planning and management of MPAs.

### **History**

In 1903, President Theodore Roosevelt established the first MPA in the USA at the Pelican Island National Wildlife Refuge. MPAs expanded across the country, with the National Marine Sanctuary Act passed in 1972, which outlined the process for creating Sanctuaries. The Coastal Zone Management Act was also passed in 1972, which established the National Estuarine Research Reserve System, a network of MPAs for research, education, and stewardship. By the 1980s, states such as Florida and Michigan began creating their own systems for preserving their aquatic habitats. At this point, MPAs were being managed at various levels of the government, which remains true to this day.

In 2000, President Clinton issued Executive Order 13158, which defines MPA as, "Any area of the marine environment that has been reserved by Federal, State, territorial, tribal or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein" (1). The Order also called for the establishment of a National System of Marine Protected Areas, which was officially established in 2009 (3). The purpose of the national system is to "strengthen and connect the nation's diverse marine protected area programs in order to more effectively protect the nation's natural and cultural marine heritage and living marine resources for current and future generations" (6)

### **MPA Regulation and Management**

The National Marine Protected Areas Center developed a Classification System which allows agencies and stakeholders to describe MPAs using five objective characteristics common to most MPAs: Conservation Focus, Level of Protection, Permanence of Protection, Constancy of Protection, Scale of Protection (5). Conservation Focus refers to the specific characteristics of the area that the MPA was established to protect, such as natural or cultural heritage or sustainable production. The Level of Protection is the type of legal protections that are afforded to the site's resources and ecological processes by determining which activities are permitted within its boundaries. This ranges from Uniform Multiple-Use or Zoned Multiple-Use to areas of No Access. Permanence of Protection refers to if the protections are permanent, conditional, or short-term, like a fishery closure. Similarly, Constancy of Protection is if the protections are year-round, seasonal, or rotating. Finally, Scale of Protection can range from an entire ecosystem or process to a single focal species. These five functional characteristics can be used to provide a

clear image of why the site was established, what it is intended to protect, how it achieves that protection, and how it may impact local ecosystems and human uses (5).

U.S. MPAs have been established by over 100 legal authorities, with some federal and state agencies managing more than one MPA program, each with its own legal purpose (6). The variety of types of MPAs can make studying and comparing U.S. MPAs rather complex and confusing, which could cause missed opportunities for broader conservation through coordinated planning and management. According to the MPA Inventory in 2012, approximately 75% of the nation's MPAs are managed by coastal states and territories, while 22% are under federal jurisdiction. Although most U.S. MPAs are managed by states and territories, these areas are relatively quite small. In contrast, federally managed areas such as Federal fishery closures and National Monuments tend to be very large. For this reason, approximately 98% of the total U.S. MPA area is managed by federal agencies (3).

### **Current Status**

The 2012 Analysis of MPAs reported that the U.S. currently has more than 1700 MPAs which cover over 41% of U.S. marine waters, and vary widely in purpose, legal authorities, managing agencies, management approaches, level of protection, and restrictions on human uses (see Figure 1). The majority (86%) of our nation's MPAs are multiple-use sites that allow a variety of human activities, including fishing and other extractive uses. In contrast, only 14% of all U.S. MPAs are no take areas that prohibit the extraction or significant destruction of natural or cultural resources (3). These no-take reserves are relatively rare, and they only account for 3% of U.S. waters (1). The West Coast (specifically California, Oregon, and Washington) has the most MPAs, but the region with the largest total area of MPAs is the Pacific Islands (13). This is

due to the Papahānaumokuākea Marine National Monument, which was established in 2006 and is the largest MPA and no-take area in the world (3).

MPAs created and managed by different authorities tend to protect different types of resources. Many state MPAs were created to protect specific coastal habitats and resources, such as beaches and nesting bird habitats, while most of the federally managed MPAs primarily include sites such as national marine sanctuaries and parks, seashores and wildlife refuges, and federal fishery closures (13). Sixty-eight percent of U.S. MPAs were created, at least in part, to conserve natural heritage values such as biodiversity, ecosystems, or protected species, which represents about half of the total MPA area in the U.S. On the other hand, roughly 23% of U.S. MPAs focus on sustainable production, which constitutes the other half of total U.S. MPA area. Around 9% of U.S. MPAs and less than 1% of the total U.S. MPA area focus primarily on conserving the cultural heritage of our nation (3).

## **Chapter 2: MPAs in Italy**

### **Italian Coastal Life**

Italy is roughly the size of California, but with a slightly longer coastline and a population of about 56 million, of which about half live within 30 miles of the coast (7). Marine life is deeply engrained into Italian culture, as it has been a vital resource to civilizations on the Italian peninsula for thousands of years. Due to this long history, it is no wonder that the Mediterranean is one of the priority eco-regions in the world. It contains only 0.82% of the ocean surface, but with nearly 17,000 known marine species today it is home to 4-18% of the global marine biodiversity with similarly high endemism (12). The Mediterranean contains important reproduction regions for many pelagic species, such as the Atlantic bluefin tuna, the great white shark, and the green and loggerhead sea turtles. Many of these species are rare and are classified by IUCN as threatened or endangered.

### **History**

Italian Law 979, passed in 1982, authorized the designation of no more than 50 MPAs in Italian coastal waters. This authority was originally given to the Ministry of Marine and Mercantile Affairs but was passed on to the Ministry of Environment and Territorial Protection after its creation in 1986. Many sites were initially evaluated as potential MPA sites, with the first 2 being established in 1986 and another 5 in 1991. In addition to their own MPA system, Italy is involved in the Barcelona Convention of 1978, which expanded its scope in 1995 to protect the coastal and marine environment of the Mediterranean. This protocol established Specially Protected Areas of Mediterranean Importance (SPAMI), which are protected areas located partially or entirely on the high seas and are important due to a high degree of

biodiversity, the uniqueness of the habitat, the presence of rare, endangered or endemic species, or are of special interest from a scientific, aesthetic, cultural or educational point of view.

### **MPA Regulation and Management**

Potential MPAs in Italy must first be designated as “marine retrieval areas” worthy of protection, at which point they will be evaluated by the Ministry of Environment and an administrative process begins for the creation of the institution. This process involves studying both the natural environment and the socio-economic activities in the region, which allows them to create a management plan that respects its natural and socio-economic characteristics. Important protected sites include scientific, ecological, cultural, educational and economic characteristics, such as an endangered species or archeological site. The decree of the Minister of the Environment must delineate the protected area and have specific conservation objectives for the protection. All Italian MPAs are divided into three zones with varying levels of protection. Zone A is the true heart of the reserve and represents an area with no human impact. All human activity is prohibited in this zone, other than authorized scientific research and service activities. Zone B is the general reserve area, where many harmful activities are prohibited or regulated while granting sustainable use of the resources at a lower impact level. Zone C is a partial reserve which acts as a buffer between the protected and non-protected areas, and these are typically the largest areas of the MPAs (4).

The management of marine protected areas is entrusted by the Minister of Environment to public bodies, scientific institutions or recognized environmental associations. Sometimes, a city will be in charge of managing the MPA, while other MPAs may be managed by a consortium of invested entities, such as provincial governments or universities. The funds for

managing the MPAs are provided by the government in Rome, although supplementary funds and services may be provided locally. Due to local management, there is a high level of local involvement in MPA day-to-day responsibilities. However, due to the governmental structure of Italian cities, the management and fate of MPAs can be in the hands of ever-changing mayors with ever-changing ideas for the direction of the protected area. Local management also causes issues with conflicting national and local interests, which creates barriers to creating a national system of MPAs (4).

### **Current Status**

As of 2013, the Ministry of Environment reported that 48 marine retrieval sites have been identified, 5 of which have been indicated as worthy of protection but no official process has begun (see Figure 2). Of the 48 sites, preliminary investigations have begun for 17 of the sites to be established as MPAs and are in some stage of the process (see Figure 3). The remaining 27 areas (see Figure 4) have been successfully established as MPAs, in addition to 2 submerged parks, which together protect around 880 square miles of sea and over 400 miles of coastline. Italy is also involved in the International Marine Mammal Sanctuary, located in the Ligurian Sea on Italy's northwest coast, which covers a vast area of coastline and around 10,000 square miles of sea. The SPAMI List consists of 32 sites, as of 2013, 10 of which are Italian MPAs. In order to achieve this status, MPAs must promote study initiatives that allow to monitor the health of the seabed annually, in order to verify the maintenance of a high degree of biodiversity (4).

## Conclusion

Coastal life and the economy it supports are both vital parts of both American and Italian governments, so it is clear to see why their governments would support protecting their marine resources. While both countries have a long history of protecting terrestrial life, protecting marine resources is still a relatively new process with many unexplored potentials. Due to the factors such as culture, biogeography, and politics, MPAs in the U.S. and Italy are planned and managed much differently. For example, the U.S. controls the largest exclusive economic zone in the world, and that gives the U.S. access to a vast amount of marine resources across several biomes. With this amount of sea area, it is possible to protect a large area or number of areas without crippling industries such as the fishing industry. On the other hand, Italians must share the Mediterranean with their neighbors, so their approach to MPAs is more limited and cooperational.

Another key difference in MPAs of the U.S. and Italy is the effective planning and management of those areas. In the U.S., the establishment of new MPAs is largely decentralized, with states and corporations being able to plan and manage new MPAs. This can cause the creation of token MPAs, which are ineffective sites that give the illusion of protection. The decentralization also causes issues with cooperation between MPAs, and it makes creating a national MPA network relatively difficult. The National System of MPAs was created to fix this issue, but it is a voluntary program to join and MPAs must meet certain criteria to be eligible. The National System of MPAs also gives a framework for effective MPA management, which aids in connectivity and cooperation across the MPA network. In Italy, the cap of 50 MPAs ensures that all new MPAs are thoroughly researched and planned prior to being established, and the central government has the power to establish the MPAs. Then, the continued management of

the MPAs is done at a local level, by city governments or a consortium of invested parties. Although this helps MPAs get off on the right foot, the cyclical nature of political power can cause irregularity in MPA management and direction. The Italian government has recognized this issue and is working towards creating their own national system of MPAs.

With Italy nearing its maximum limit of MPAs, their focus is on increasing effective management, cooperation, and connectivity not only with their own MPAs, but also with the MPAs of other nations in the Mediterranean. The U.S. is also involved in international marine protection programs and agreements, but it has so far failed to reach its agreed upon levels of protection. In some cases, the current administration has rolled back environmental protections to the detriment of our natural resources. Many organizations, such as the IUCN, have plans and suggestions to support a global increase in marine protection.

Figures

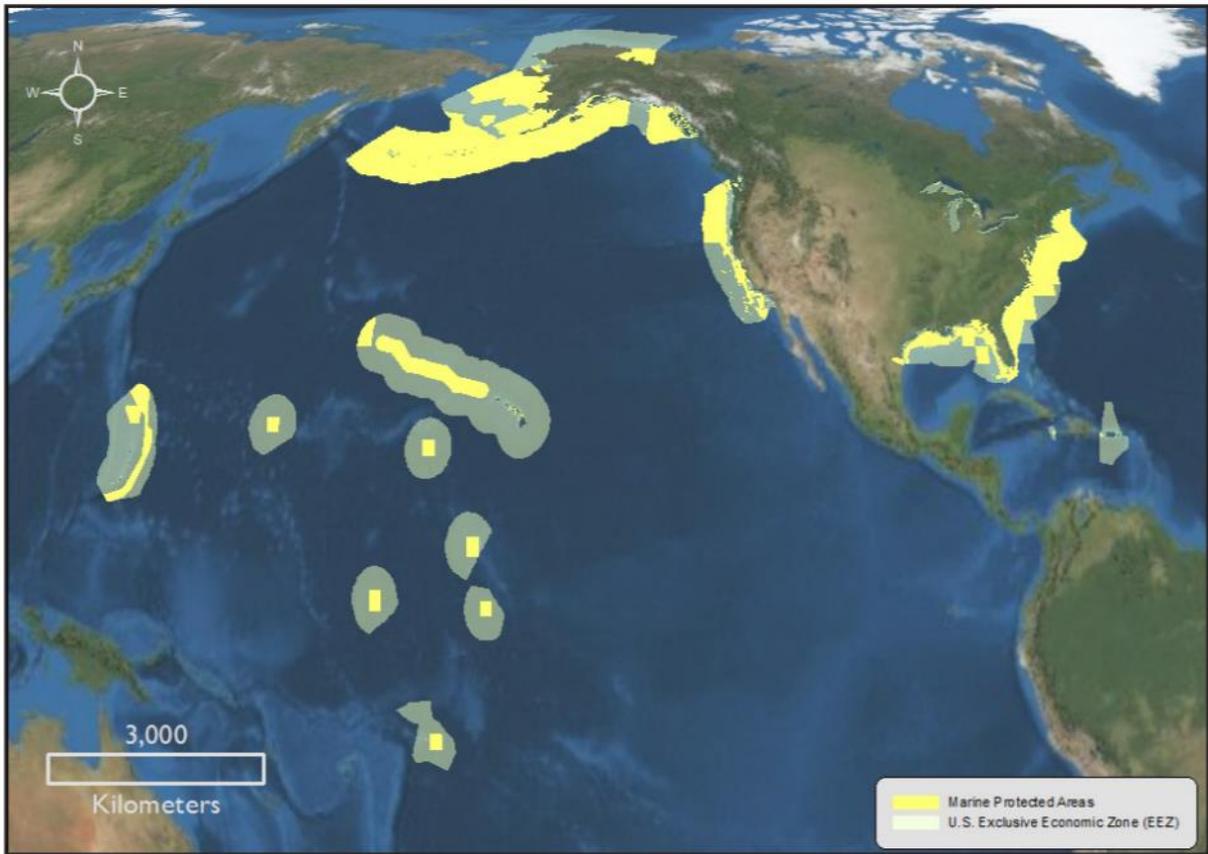


Figure 1: U.S. Exclusive Economic Zone and MPAs (NOAA)



Figure 2: Italian Marine Retrieval Areas (Italian Ministry of Environment)



Figure 3: Italian MPAs – to be established (Italian Ministry of Environment)



Figure 4: Italian Marine Protected Areas (Italian Ministry of Environment)

## Works Cited

1. "About Marine Protected Areas." *Marine Protected Areas*, National Marine Protected Areas Center, [marineprotectedareas.noaa.gov/aboutmpas/](http://marineprotectedareas.noaa.gov/aboutmpas/).
2. "America's Coasts." *Economics and Demographics*, NOAA, [coast.noaa.gov/states/fast-facts/economics-and-demographics.html](http://coast.noaa.gov/states/fast-facts/economics-and-demographics.html).
3. *Analysis of United States MPAs*. Marine Protected Areas Inventory, Mar. 2012, [nmsmarineprotectedareas.blob.core.windows.net/marineprotectedareas-prod/media/archive/pdf/helpful-resources/mpa\\_analysis\\_2012\\_0320.pdf](http://nmsmarineprotectedareas.blob.core.windows.net/marineprotectedareas-prod/media/archive/pdf/helpful-resources/mpa_analysis_2012_0320.pdf).
4. "Aree Marine Protette." *Ministero Dell'Ambiente e Della Tutela Del Territorio e Del Mare*, [www.minambiente.it/pagina/aree-marine-protette](http://www.minambiente.it/pagina/aree-marine-protette).
5. *Definition & Classification System for U.S. Marine Protected Areas*. National Marine Protected Areas Center, Mar. 2011, [nmsmarineprotectedareas.blob.core.windows.net/marineprotectedareas-prod/media/archive/pdf/helpful-resources/factsheets/mpa\\_classification\\_may2011.pdf](http://nmsmarineprotectedareas.blob.core.windows.net/marineprotectedareas-prod/media/archive/pdf/helpful-resources/factsheets/mpa_classification_may2011.pdf).
6. *Framework for the National System of Marine Protected Areas of the United States of America*. National Marine Protected Areas Center, Mar. 2015, [nmsmarineprotectedareas.blob.core.windows.net/marineprotectedareas-prod/media/archive/nationalsystem/framework/final-mpa-framework-0315.pdf](http://nmsmarineprotectedareas.blob.core.windows.net/marineprotectedareas-prod/media/archive/nationalsystem/framework/final-mpa-framework-0315.pdf).

7. "Italy's 'Sanctuaries.'" *Monterey Bay National Marine Sanctuary*,  
[montereybay.noaa.gov/international/italia/mpa.html](http://montereybay.noaa.gov/international/italia/mpa.html).
8. "Marine Protected Areas." *WWF*,  
[wwf.panda.org/our\\_work/oceans/solutions/protection/protected\\_areas/](http://wwf.panda.org/our_work/oceans/solutions/protection/protected_areas/).
9. "Marine Protected Areas." *IUCN*, 23 Jan. 2020, [www.iucn.org/theme/marine-and-polar/our-work/marine-protected-areas](http://www.iucn.org/theme/marine-and-polar/our-work/marine-protected-areas).
10. "Marine Protected Areas and Climate Change." *IUCN*, 5 Dec. 2018,  
[www.iucn.org/resources/issues-briefs/marine-protected-areas-and-climate-change](http://www.iucn.org/resources/issues-briefs/marine-protected-areas-and-climate-change).
11. "What Is a Marine Protected Area?" *NOAA's National Ocean Service*, NOAA, 1 June 2013,  
[oceanservice.noaa.gov/facts/mpa.html](http://oceanservice.noaa.gov/facts/mpa.html).
12. *The Status of Marine Protected Areas in the Mediterranean Sea*. MedPan, 2012.  
[http://www.racspa.org/sites/default/files/doc\\_medmpanet/final\\_docs\\_regional/5\\_status\\_of\\_marine\\_protected\\_areas\\_in\\_the\\_mediterranean\\_2012.pdf](http://www.racspa.org/sites/default/files/doc_medmpanet/final_docs_regional/5_status_of_marine_protected_areas_in_the_mediterranean_2012.pdf)
13. "Where Are Marine Protected Areas Located?" *NOAA's National Ocean Service*, NOAA, 1 June 2013, [oceanservice.noaa.gov/facts/mpaloc.html](http://oceanservice.noaa.gov/facts/mpaloc.html).

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## Re: Completed Honors Capstone

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Clare Crenshaw <cec0018@uah.edu>

Fri, May 8, 2020 at 3:09 PM

To: Bruce Stallsmith <stallsb@uah.edu>

Cc: David Cook <dac0010@uah.edu>, William Wilkerson <wilkerw@uah.edu>, Paul.Wolf@uah.edu

Thank you Dr. Stallsmith!

On Fri, May 8, 2020 at 3:04 PM Bruce Stallsmith <stallsb@uah.edu> wrote:

OK, it looks good, my signature is affixed. You were lucky to be able to go to Italy when you did.

On Fri, May 8, 2020 at 2:42 PM Clare Crenshaw <cec0018@uah.edu> wrote:

Hello Dr. Stallsmith,

I've attached my completed Honors Capstone for your approval, with the signed Title Page and Copyright Permission form. I made my topic more specific, as you suggested, so there have been quite a few changes to the original proposal. If you approve, please email back approval according to the updated submission instructions and I will turn it in as instructed. Thank you!

--

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