

# Submission form for Ocean-Shot Concepts-Round 2

Response ID:5 Data

## 1. (untitled)

**1. Ocean-Shot Contact Information: \*Note - This information will be shared with the National Committee for the Ocean Decade in order to receive feedback. It will also be made publicly available if the Ocean-Shot concept is accepted into the Ocean-Shot Directory.**

Primary Contact Name (First & Last) : Chad Wong  
Organization : Florida Fish and Wildlife Conservation Commission  
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## 2. Ocean-Shot Title

The Endless Dive: Marine Species 3D response to climate change in oceans.

**3. Author(s): \*Please list contributors to the submitted Ocean-Shot concept with first and last names in the order you wish them to be referenced for *potential* use in the Ocean-Shot Directory. Examples can be found [here](#):**

Chad Wong

**4. Ocean-Shot Directory Summary (Please provide a short introduction/description of the Ocean-Shot concept for *potential* use in the Ocean-Shot Directory, 100 word limit. Examples can be found [here](#).):**

It is well known throughout different ecological systems that with a warming climate, plant and animal species have moved northward to combat the changing climate. This has also been seen in regards to elevation, from reptilian microhabitats to large-scale mountain ranges. Could marine life follow this pattern? With such a unique, 3D landscape, species can move both deeper and northward in response to climate change. This could lead to impacts on fisheries as well as food chains and communities.

**5. Abstract (describe hypothesis, scientific and/or technological objective, 200 word limit):**

Would there be a correlation to marine species' 3D movement with climate change as seen in terrestrial systems? If so, how large of a scale does it encompass and how does it affect the communities the species is a part of?

The objective would be to coordinate a large-scale project of different migrational and non-migrational species to see if there is a change in movement patterns related to thermal tolerance and at what size scale (movement to different microhabitat, to different layers of water, to different bodies of water, etc.)

**6. Please select the challenges (no more than 3) that are most relevant to your concept (Expanded reference [below](#)):**

Challenge 2: Understand the effects of multiple stressors on ocean ecosystems, and develop solutions to monitor, protect, manage and restore ecosystems and their biodiversity under changing environmental, social and climate conditions.

Challenge 3: Generate knowledge, support innovation, and develop solutions to optimize the role of the ocean in sustainably feeding the world's population under changing environmental, social and climate conditions.

Challenge 5: Enhance understanding of the ocean-climate nexus and generate knowledge and solutions to mitigate, adapt and build resilience to the effects of climate change across all geographies and at all scales, and to improve services including predictions for the ocean, climate and weather.

**7. Describe how your Ocean-Shot addresses the selected challenges (150 word limit).**

My Ocean-Shot addresses the selected challenges as it uses climate change as a determining factor in ecological change, that could not only affect local communities of species, but international specie's movement/migration. The initial aspects of the project would allow us to build a database on movement of a selected few species that represent different thermal tolerances and migrational habitats. From this data, we could categorize what general species, such as that of order or class, are being dramatically changed due to climate change. Once this correlation is established, it can then be compared against current fisheries data and effort surveys to see if either a) their data also correlates with a movement of species more

northward or deeper b) whether if effort and depth fished stayed the same over time, if there was a change in harvest rates that could be correlated to climate change. All systems are interconnected in this project.

#### **8. Vision and potential transformative impact (200 word limit):**

The vision of this project is one of proactive conservation. This is an area that is lacking first-hand data in marine systems, while well documented in multiple taxa of terrestrial species from plants, to animals and insects. It would allow for governments to reconsider their current conservation strategies and possibly change the way fisheries are run. But the main impact that it will have is being a large-scale study that will hopefully create the foundation to a multi-organizational database to track the 3D movement of marine species throughout the world. This would allow for better conservation efforts in regards to climate change, as well as international efforts on marine conservation through multi-governmental MPAs and international collaboration for conservation.

#### **9. Realizable, with connections to existing U.S. scientific infrastructure, technology development, and public-private partnerships (150 word limit):**

While the technology has been available and continues to increase in efficiency daily, the true challenge is scale and implementation. This project would involve at the minimum national cooperation along U.S. coasts and organizations such as NOAA and FWS in order to evaluate a somewhat representative sample of marine species in different ocean systems. If possible, the ideal would be to have public and private organizations (fisheries included) be part of this tagging effort, in order to increase data size and bring awareness to the public. It would also be important to involve other international governments through the IUCN or similar bodies so that large-scale migrational species could be observed and studied.

#### **10. Scientific/technological sectors engaged outside of traditional ocean sciences (100 word limit):**

One of the largest sectors that would be engaged outside of traditional ocean sciences is international partners. Throughout the past few decades, there has been a clear distinction between the "study area/species" and what is considered "externalities". But as we know, climate change affects all aspects of life and every system. To not include other countries, government bodies, and NGOs would be a disservice to the mass amounts of data we have gained recently about the interconnectedness of marine systems.

#### **11. Opportunities for international participation and collaboration (100 word limit):**

International participation and collaboration are what this project is all about. No ecosystem, community, population, or species has been unaffected by climate change in some way. The more marine bodies are recognized as one large interacting body, the more apparent relationships become that were disregarded prior. Especially in relation to migration and fisheries, this is an area of concern for not only the U.S. but all countries involved in ocean systems. Through working together we can not only investigate more species, but we can also realize connections that have been right under our noses the entire time.

#### **12. Develops global capacity and encourages the development of the next generation of ocean scientists (100 word limit):**

Just as important as spatial scale is temporal scale, and with climate change, time is extremely important. While unfortunately, we are seeing drastic changes due to climate change currently, this project would need to involve multi-generational studies. This is because that when we look at studies on too small of a time scale, we make inferences that appear to be true short-term but do not hold up long-term. Climate change is not going anywhere and based on the current IUCN predictions, we will need to study its effects for at least the next few generations at a minimum .

## **2. Thank You!**

### **Thank You Email**

Apr 27, 2021 20:23:13 Success: Email Sent to: chadcwong@gmail.com