Fish Production Calculator for Salt Marsh and Seagrass Habitats

**Presenters & Institutions:**
Emily Farr, NOAA Fisheries Office of Habitat Conservation, emily.farr@noaa.gov  
Bryan DeAngelis, The Nature Conservancy  
Kara Meckley, NOAA Fisheries Office of Habitat Conservation

**Web address:** [https://oceanwealth.org/applications/seagrass-saltmarsh-calculator/](https://oceanwealth.org/applications/seagrass-saltmarsh-calculator/)

**INTENDED AUDIENCE**
Habitat conservation and restoration practitioners and funders; fisheries and natural resource managers and scientists

**MAIN USE**
The number of fish and invertebrates that are born and survive each year depends a lot on habitat. This interactive tool allows the user to estimate how many juvenile fish, crabs, and shrimp are produced within salt marsh and seagrass habitats in the northern Gulf of Mexico. The fish production estimates in the tool are derived from recently published habitat valuation research. The tool draws on thousands of fish and invertebrate records across the Gulf of Mexico, and provides an understanding of which fish, shrimp, and crabs are enhanced by these habitats in the initial stage of their life.

The main interface of the tool includes a “calculator” section next to a map of comprehensive spatial data for seagrass and salt marsh edge in the Gulf of Mexico. The tool allows users to select an area of seagrass or salt marsh edge by drawing a polygon on the map. Once an area is selected, the total acreage (or hectares) of seagrass and saltmarsh edge in the polygon is displayed. Alternatively, users can enter an area of habitat directly. The user then selects from a list of fish and mobile invertebrates that are known to be enhanced by salt marsh or seagrass habitat in the Gulf of Mexico, based on recently published habitat valuation research. The tool then displays fish production estimates in (1) total number of juvenile fish and invertebrates produced and (2) yearly production in pounds, meaning the biomass that cohort of fish contributes to the system over the course of their lifetime. Finally, there is an option to download the data.

By placing a value on an area of salt marsh or seagrass habitat—measured by the number and type of fish, crabs, and shrimp produced—natural resource managers can make informed decisions about protecting or restoring coastal habitats. This tool helps answer questions like,
“how much habitat do we need to increase the production of a particular species?” or “how many fish would we lose every year if this area of coastal habitat is lost?” We hope it will be especially valuable for fishery managers wanting to understand the importance of nursery habitats for fish production, and for habitat funders and practitioners to evaluate the potential benefits of investing in a given area of coastal ecosystem protection or restoration.

**GEOGRAPHY & SCALE**
The tool covers salt marsh and seagrass habitats across the northern Gulf of Mexico. Fish production can be estimated at a 1 acre to 5km scale.

**ACCESSIBILITY**
The tool is available online, and can be accessed at this [link](https://mappingoceanwealth.com). It is housed on the [Mapping Ocean Wealth](https://mappingoceanwealth.com) website.

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**SmartOysters Data Management Platform**

**Presenter:** Josh Neese

**Affiliation:** SmartOysters – US Representative

**Email:** josh@smartoysters.com

**Web address:** [www.smartoysters.com](http://www.smartoysters.com)

**INTENDED AUDIENCE**
The intended audience is diverse, primarily focusing on aquaculture operations but with restorative, research, and monitoring applications as well. This includes academic researchers, federal, state, and municipal agencies, not-for-profit organizations, and private environmental firms in addition to oyster, mussel, seaweed, and finfish aquaculturists. SmartOysters can assist with any environmental data and monitoring needs while providing traceability and transparency to any project.

**MAIN USE**
SmartOysters is a cloud-based data management platform which allows users to collect data in the form of inventory on a farm or monitoring of a restoration site, while quantifying ecosystem services based on quantity and size of data collected for use in marketing, outreach, or education of the human benefits derived from an estuary’s natural functions. The user-friendly interface and customizable reporting features are also applicable in ecological research including but not limited to habitat, wildlife and fisheries, and water quality monitoring. SmartOysters task management function allows for remote project oversight and reporting. Furthermore, the mapping functionality has been applied in assisting farms and surrounding communities in locating and retrieving lost gear, mitigating marine debris by engaging community stakeholders. This was developed to help farmers recover gear and crops after an extremely active 2020 hurricane season that affected most of the Gulf Coast. Regardless of what capacity the platform is utilized, it offers a peace of mind to the users by...
managing any necessary data and tasks without relying on memory or “back of the envelope” type data recording.

**GEOGRAPHY & SCALE**
SmartOysters was developed in Australia by an oyster farmer and is currently in use globally. Oyster farmers in all Gulf states also subscribe to the platform to manage their aquaculture operations with interest in applying the tool to the high priority oyster habitat restoration market. Scale of the operation is insignificant as sites are individually charted using a GPS-based mapping system. Current users range from quarter acres up to TEN(?) acres with no minimum or maximum thresholds, perfect for both large- and small-scale projects.

**ACCESSIBILITY**
SmartOysters is a subscription service accessed via a free app on an iPhone or Android operating system using a phone or tablet. The cloud-based platform is efficient in securely recording data in seconds while mitigating the potential for misplaced or indecipherable records and eliminating errors and the need for recording information more than once – saving time and money.