

ANNUAL REPORT

TO THE

TECHNICAL COORDINATING COMMITTEE

GULF STATES MARINE FISHERIES COMMISSION

OCTOBER 1, 2020 TO SEPTEMBER 30, 2021

SEAMAP Subcommittee

Ted Switzer, Chairman

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SEAMAP Coordinator

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TABLE OF CONTENTS

INTRODUCTION	1
FY2021 SEAMAP RESOURCE SURVEYS	1
Fall Shrimp/Groundfish Survey	1
Spring Plankton Survey	2
Bottom Longline Survey.....	3
Vertical Line Survey	3
Reef Fish Survey.....	4
Summer Shrimp/Groundfish Survey.....	4
Fall Plankton Survey	4
INFORMATION SERVICES.....	5
SEAMAP Information System	5
Real-time Data	6
PROGRAM MANAGEMENT	6
Planning	6
Information Dissemination	6
Proposed 2022 Activities	7
FY2021 Financial Report.....	7
TABLE 1. SEAMAP REPRESENTATIVES FOR FY2021	8
TABLE 2. SEAMAP WORK GROUP MEMBERS FOR FY2021	9
TABLE 3. PRELIMINARY 2022 PROGRAMMATIC BUDGET	12
TABLE 4. PROPOSED SEAMAP-GULF ACTIVITIES, 2022	12

INTRODUCTION

The Southeast Area Monitoring and Assessment Program (SEAMAP) is a State/Federal/University program for the collection, management, and dissemination of fishery-independent data and information in the southeastern United States. The program presently consists of three operational components: SEAMAP-Gulf of Mexico, which began in 1981; SEAMAP-South Atlantic, implemented in 1983; and SEAMAP-Caribbean, formed in 1988.

Each SEAMAP component operates independently, planning and conducting surveys and information dissemination in accordance with administrative policies and guidelines of NOAA Fisheries' Southeast Regional Office (SERO).

Federal programmatic funding for SEAMAP activities and administration was appropriated in Federal Fiscal Years 1985-2021 (October 1 through September 30). State and Gulf States Marine Fisheries Commission (GSMFC) funding allocations for FY1985-FY2021 were handled through State/Federal cooperative agreements, administered by SERO and the Southeast Fisheries Science Center (SEFSC), NOAA Fisheries.

In FY2021, SEAMAP operations continued for the thirty-ninth consecutive year. SEAMAP resource surveys included the Fall Shrimp/Groundfish Survey, Spring Plankton Survey, Summer Shrimp/Groundfish Survey, Reef Fish Survey, Bottom Longline Survey, Vertical Line Survey, Fall Plankton Survey, and plankton and environmental data surveys. Other FY2021 activities included SEAMAP information services and program management.

This report is the thirty-eighth in a series of annual SEAMAP Subcommittee reports to the Technical Coordinating Committee (TCC) of the Gulf States Marine Fisheries Commission. It is intended to inform the TCC of SEAMAP-Gulf of Mexico activities and accomplishments during FY2021 and proposed SEAMAP activities for FY2022.

Appreciation is gratefully extended to the staff of the Gulf States Marine Fisheries Commission for their considerable assistance in the preparation of this document.

FY2021 SEAMAP RESOURCE SURVEYS

The surveys conducted during the year address distinct regional needs and priorities and provide information concerning the marine resources in the Gulf of Mexico. Other activities included SEAMAP information services and program management.

Fall Shrimp/Groundfish Survey

The Fall Shrimp/Groundfish Survey was conducted from October 1 to December 11, 2020 from off southwest Florida to the U.S.-Mexican border. NOAA Fisheries, Florida, Alabama,

Mississippi, and Louisiana sampled two hundred fifty trawl stations during the survey. The Fall Shrimp/Groundfish Survey effort was impacted by numerous tropical systems last fall. Vessels sampled waters out to 60 fm with trawls in addition to environmental sampling. The objectives of the survey were to:

- (1) sample the northern Gulf of Mexico to determine abundance and distribution of demersal organisms from inshore waters to 60 fm;
- (2) obtain length-frequency measurements for major finfish and shrimp species to determine population size structures; and
- (3) collect environmental data to investigate potential relationships between abundance and distribution of organisms and environmental parameters.

Spring Plankton Survey

The SEAMAP Spring Plankton Survey was conducted by NOAA Fisheries from April 28 - May 26, 2021. Ninety-seven stations were sampled during the survey. The objectives of the survey were to assess, using neuston and bongo nets, the occurrence, abundance and geographical distribution of the early life stages of spring spawning fish, especially Atlantic Bluefin Tuna, from mid-continental shelf to offshore Gulf of Mexico waters in support of annual stock assessments and collect environmental data at all ichthyoplankton stations.

Plankton samples were taken with standard SEAMAP bongo and neuston samplers. The bongo sampler consisted of two conical 61-cm nets with 333-micron mesh. Tows were oblique, surface to near bottom (or 200 m) and back to surface. A mechanical flowmeter is mounted off-center in the mouth of each bongo net to record the volume of water filtered. Volume filtered ranges from approximately 20 to 600 m³ but is typically 30 to 40 m³ at the shallowest stations and 300 to 400 m³ at the deepest stations. A single or double 2x1 m pipe frame neuston net fitted with 0.947 mm mesh netting is towed at the surface with the frame half-submerged for 10 minutes. Samples are taken upon arrival on station, regardless of time of day. At each station, either a bongo and/or neuston tow are made depending on the specific survey. Preservation protocol called for the right bongo samples to be preserved in 10% formalin and then transferred to fresh 95% ethanol after 36 hours. The original standard SEAMAP method of initial preservation in 10% formalin for 48 hours was changed to 36 hours in order to improve long term storage for genetic analysis. The left bongo and neuston samples are initially preserved in 95% ethanol and then transferred to fresh 95% ethanol after 24 hours. In addition, hydrographic data (surface chlorophylls, salinity, temperature and dissolved oxygen from surface, midwater and near bottom, and Forel-ule color) were collected at all stations.

Right bongo and neuston samples collected from SEAMAP stations were transshipped to the Polish Sorting and Identification Center. Left bongo samples were archived at the SEAMAP Invertebrate Plankton Archiving Center (SIPAC).

Bottom Longline Survey

The SEAMAP Bottom Longline Survey is a nearshore survey that complements an existing long-term fisheries independent longline survey being conducted by NOAA Fisheries, by targeting shark and finfish species within the shallow waters of the Gulf of Mexico. The objectives of the survey are to collect information on shark and finfish abundances and distribution with a 1-mile longline and to collect environmental data.

The Bottom Longline Survey samples during three seasons Spring (April-May), Summer (June-July), and Fall (August-September). Sampling is conducted in waters defined by the 3-10m depth contour. NMFS Statistical Zones are used as guides to ensure effective distribution of sampling effort. Stations are proportionally allocated and randomly distributed within the 3-10m depth contour in each statistical zone based on the proportion of those depths present. Since the 3-10m depth strata is smaller in some statistical zones relative to other statistical zones, each statistical zone is allocated at least two stations during each season in order to ensure adequate sampling coverage.

Vertical Line Survey

The SEAMAP Vertical Line Survey is currently being conducted off Alabama, Louisiana, and Texas. Two hundred twenty stations are scheduled to be sampled in 2021. The Vertical Line Survey uses three bandit reels that are outfitted with ten circle hooks (8/0, 11/0 or 15/0). Each has only one hook size. The bandit reels deploy the gear simultaneously on or near a reef structure and, once locked in at depth, are allowed to fish for 5 minutes. All bandit reels then retrieve the lines simultaneously. Catch data are collected once the lines are onboard. Environmental data is collected upon completion of fishing at each station.

The Vertical Line Survey design divides the Gulf offshore waters between 10 and 150m into 150x150m grid blocks. Unknown habitat, known natural reef (hard bottom), presumed reef either natural or artificial, oil/gas platforms, and artificial reefs were the five habitat classifications developed by the SEAMAP Subcommittee. Each 150x150m grid block is assigned a habitat classification based upon several different datasets used to develop the sampling universe. A grid block can be classified as more than one habitat type if it has more than one habitat located within it.

For the station selection process, the total amount of habitat within the three depth zones (10-20m, 20-40m, and 40-150m) is computed. The percentage of area covered by each depth zone determines the percentage of the total stations that will be sampled within each depth zone (i.e. if a depth zone contains 40% of the total area, 40% of the total stations will be assigned to that depth zone). The total area of each habitat classification is calculated within each depth stratum. The total of each habitat classification, excluding unknown habitat, is then used to calculate the percentage of habitats within the depth zone. This percentage is used to determine how many stations are assigned to each habitat type within the depth zone. Stations are randomly selected based upon the habitat classification percentages within each depth zone.

Reef Fish Survey

The primary purpose of this survey was to assess relative abundance and compute population estimates of reef fish found on natural reef fish habitats in the Gulf of Mexico. Video stereo cameras were used during the survey since they enabled the measurement of length frequencies. Each stereo camera contained paired black-and-white Videre stereo cameras along with a color mpeg camera in a cylindrical pressure housing. Four of these were mounted in a camera array and were positioned orthogonally with the center of the camera mounted 51 cm above the bottom of the array. The camera array was baited with squid. The camera array was allowed to soak on the bottom for 30 minutes, and the fish trap soaked for one hour. NOAA Fisheries sampled 464 camera stations from March - June during the 2021 SEAMAP Reef Fish Survey, while Florida sampled 807 camera stations. In addition, the state of Florida conducted 69 habitat mapping surveys.

Summer Shrimp/Groundfish Survey

The SEAMAP Summer Shrimp/Groundfish Survey was conducted from June 1 to July 19, 2021. NOAA Fisheries, Florida, Alabama, Mississippi, and Louisiana sampled two hundred twenty-three trawl stations in this year's survey. Survey effort was impacted by vessel related COVID protocols. This was the thirty-ninth year for the survey.

Objectives of the Summer Shrimp/Groundfish Survey were to:

- (1) monitor size and distribution of penaeid shrimp during or prior to migration of brown shrimp from bays to the open Gulf;
- (2) aid in evaluating the "Texas Closure" management measure of the Gulf Council's Shrimp Fishery Management Plan; and
- (3) provide information on shrimp and groundfish stocks across the northern Gulf of Mexico from inshore waters to 60 fm.

Fall Plankton Survey

The Fall Plankton cruise took place from September 9 through October 4, 2021. NOAA Fisheries completed ninety-seven stations during the survey. The objective of this survey was to collect ichthyoplankton samples with bongo and neuston gear for the purpose of estimating abundance and defining the distribution of eggs, larvae, and small juveniles of Gulf of Mexico fish, particularly king and Spanish mackerel, lutjanids and sciaenids.

Plankton samples were taken with standard SEAMAP bongo and neuston samplers. The bongo sampler consisted of two conical 61-cm nets with 333-micron mesh. Tows were oblique, surface to near bottom (or 200 m) and back to surface. A mechanical flowmeter is mounted off-center in

the mouth of each bongo net to record the volume of water filtered. Volume filtered ranges from approximately 20 to 600 m³ but is typically 30 to 40 m³ at the shallowest stations and 300 to 400 m³ at the deepest stations. A single or double 2x1 m pipe frame neuston net fitted with 0.947 mm mesh netting is towed at the surface with the frame half-submerged for 10 minutes. Samples are taken upon arrival on station regardless of time of day. At each station either a bongo and/or neuston tow are made depending on the specific survey. Samples are routinely preserved in 5 to 10% formalin and later transferred after 36 hours to 95% ethanol for long-term storage. During some surveys, selected samples are preserved initially in 95% ethanol and later transferred to fresh ethanol. In addition, hydrographic data (surface chlorophylls, salinity, temperature, and dissolved oxygen from surface, midwater and near bottom, and Forel-ule color) were collected at all stations.

Right bongo and neuston samples collected from SEAMAP stations will be transhipped to the Polish Sorting and Identification Center. Left bongo samples will be archived at the SEAMAP Invertebrate Plankton Archiving Center (SIPAC).

INFORMATION SERVICES

Information from the SEAMAP activities is provided to user groups through the program administration and three complementary systems: the SEAMAP Information System, SEAMAP Archiving Center, and SIPAC. Products resulting from SEAMAP activities can be grouped into two major categories: data sets (including broadly, digital data and collected specimens) managed by the SEAMAP Information System, SEAMAP Archiving Center and SIPAC; and program information. Program information is discussed in the *PROGRAM MANAGEMENT* Section of this report.

SEAMAP Information System

Biological and environmental data from all SEAMAP-Gulf surveys are included in the SEAMAP Information System, managed in conjunction with NOAA Fisheries-SEFSC. Raw data are edited by the collecting agency and verified by the SEAMAP Data Manager prior to entry into the system. Data from all SEAMAP-Gulf surveys during 1982-2020 have been entered into the system and data from the 2021 surveys are in the process of being verified, edited, and entered for storage and retrieval. Verified, non-confidential SEAMAP data are available conditionally to all requesters, although the highest priority is assigned to SEAMAP participants.

Requested SEAMAP data were used for a multitude of purposes in 2021:

- Evaluating the abundance and size distribution of penaeid shrimp in federal and state waters to assist in determining opening and closing dates for commercial fisheries;
- Evaluating and plotting the size of the hypoxic (Dead Zone) area off of Louisiana;

- Assessing shrimp and groundfish abundance and distribution and their relationship to such environmental parameters as temperature, salinity, and dissolved oxygen;
- Identifying environmental parameters associated with concentrations of larval finfish;
- Assessing the potential impact the Deepwater Horizon oil spill on marine fish stocks; and
- Compiling the 2021 SEAMAP Environmental and Biological Atlas.

PROGRAM MANAGEMENT

The SEAMAP program is administered by the SEAMAP Subcommittee of the TCC through the SEAMAP Coordinator, who is under the technical direction of the Subcommittee Chairman and administrative supervision of the GSMFC Executive Director.

Personnel associated with SEAMAP program management include the Coordinator, Data Manager, SEAMAP Archiving Center Curator, SIPAC Curator and the Program Monitor from NOAA Fisheries-Pascagoula Laboratory.

Planning

Major SEAMAP-Gulf Subcommittee meetings were held in October 2020 and March 2021 in conjunction with the Annual Meeting of the GSMFC. All meetings included participation by various work group leaders, the Coordinator, the Program Monitor, and other GSMFC staff. Representatives from the Gulf program also met with the South Atlantic and Caribbean representatives in July 2021 to discuss respective program needs and priorities for FY2022.

Coordination of program surveys and distribution of quick-report summaries of a Gulf-wide survey to management agencies and industry were major functions of SEAMAP management in 2021. Other important management activities included coordinating data provision and specimen loans, preparing publications and documents and assisting in the preparation of State/Federal cooperative agreements, including amendments to permit extension of activities previously not detailed in the agreements.

Information Dissemination

The following documents were published and distributed during this reporting period:

- *SEAMAP Subcommittee Report to the GSMFC Technical Coordinating Committee - October 1, 2019 to September 30, 2020.* A detailed summary of program accomplishments, emphasizing survey design, material collected data dissemination, budget information, and future survey activities.

- *Joint Annual Report of the SEAMAP Program - October 1, 2019 to September 30, 2020.* A summary of FY2020 activities and proposed FY2021 events for the SEAMAP-Gulf, South Atlantic, and Caribbean Programs.

Proposed 2022 Activities

Preliminary 2022 SEAMAP-Gulf budget allocations are shown in Table 3. Last year, total program allocations for all three SEAMAP components, Gulf, South Atlantic and Caribbean, were approximately \$4.73 million. At the July meeting, the SEAMAP components based their allocations for 2022 on level funding. At this level, the share to be allocated for SEAMAP-Gulf activities (including GSMFC) will be \$1,953,625. Proposed FY2022 activities for all Gulf participants are shown in Table 4.

FY2021 Financial Report

Total allocations for FY2021 program administration were \$320,625. The GSMFC has arranged and paid for all expenses associated with personnel, meetings, travel, and operating expenses to date. The remaining balance will be used to provide administration of the SEAMAP-Gulf program through December 31, 2021.

TABLE 1.

SEAMAP REPRESENTATIVES FOR FY2021

Ted Switzer, Chairman
Florida Fish and Wildlife Conservation Commission
Florida Fish and Wildlife Research Institute

John Mareska
Alabama Department of Conservation and Natural Resources

Erik Lang
Louisiana Department of Wildlife and Fisheries

Jill Hendon
University of Southern Mississippi
Gulf Coast Research Laboratory

Fernando Martinez-Andrade
Texas Parks and Wildlife Department

Adam Pollack
NOAA Fisheries
Pascagoula Laboratory

John Froeschke (non-voting)
Gulf of Mexico Fishery Management Council

TABLE 2.

SEAMAP WORK GROUP MEMBERS FOR FY2021

DATA COORDINATING WORK GROUP

Lloyd Kirk, Leader
SEAMAP Data Manager
Gulf States Marine Fisheries Commission

Mike Murphy
Florida Fish and Wildlife Conservation
Commission

David Hanisko
NOAA Fisheries
Pascagoula Laboratory

John Anderson
University of Southern Mississippi
Gulf Coast Research Laboratory

Charles Weber
NOAA Fisheries
Pascagoula Laboratory

Michael Harden
LA Department of Wildlife and Fisheries

ENVIRONMENTAL DATA WORK GROUP

Chloé Dean
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Fisheries

Ryan Moyer
Florida Fish and Wildlife Conservation
Commission

Jason Herrmann
Alabama Department of Conservation and
Natural Resources

John Anderson
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Mike Stahl
Texas Parks and Wildlife Department

PLANKTON WORK GROUP

Chloé Dean
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Joan Herrera
Florida Fish and Wildlife Conservation
Commission

Paul Larson
Florida Fish and Wildlife Conservation
Commission

Janessa Fletcher
Florida Fish and Wildlife Conservation
Commission

Jason Tilley
University of Southern Mississippi
Gulf Coast Research Laboratory

Jason Herrmann
Alabama Department of Conservation
and Natural Resources

Sara LeCroy, Curator
SEAMAP Invertebrate Plankton
Archiving Center
University of Southern Mississippi/Gulf
Coast Research Laboratory

Mark Benfield
Louisiana State University

Glenn Zapfe
NOAA Fisheries
Pascagoula Laboratory

SHRIMP/GROUNDFISH WORK GROUP

Adam Pollock
National Marine Fisheries Service
Pascagoula Laboratory

Fernando Martinez-Andrade
Texas Parks and Wildlife Department

Chloé Dean
Louisiana Department of Wildlife and
Fisheries

John Anderson
University of Southern Mississippi
Gulf Coast Research Laboratory

Craig Newton
Alabama Department of Conservation and
Natural Resources

André DeBose
NOAA Fisheries
Pascagoula Laboratory

Scott Stahl
FWC/Florida Fish and Wildlife
Research Institute

LOGLINE WORK GROUP

John Mareska
Alabama Department of Conservation and
Natural Resources

Jill Hendon
University of Southern Mississippi
Gulf Coast Research Laboratory

Trey Driggers
NOAA Fisheries
Pascagoula Laboratory

Christine Jensen
Texas Parks and Wildlife Department

Christine Seither
Louisiana Department of Wildlife and
Fisheries

Ted Switzer
FWC/Florida Fish and Wildlife
Research Institute

VERTICAL LINE WORK GROUP

Ted Switzer
FWC/Florida Fish and Wildlife
Research Institute

Jill Hendon
University of Southern Mississippi
Gulf Coast Research Laboratory

Chloé Dean
Louisiana Department of Wildlife and
Fisheries

Fernando Martinez-Andrade
Texas Parks and Wildlife Department

Craig Newton
ADCNR/Marine Resources Division

Matthew Campbell
NOAA Fisheries
Pascagoula Laboratory

HABITAT MAPPING WORK GROUP

Sean Kennan
FWC/Florida Fish and Wildlife
Research Institute

Jason Tilley
University of Southern Mississippi
Gulf Coast Research Laboratory

Chloe Dean
Louisiana Department of Wildlife and
Fisheries

Lindsey George
Texas Parks and Wildlife Department

Russell Rigby
ADCNR/Marine Resources Division

Brandi Noble
NOAA Fisheries
Pascagoula

TABLE 3.
PRELIMINARY 2022 PROGRAMMATIC BUDGET

	FY2021 Funding
GSMFC	\$320,625
Alabama	\$170,000
Florida	\$416,000
Louisiana	\$410,000
Mississippi	\$442,000
Texas	\$195,000
Total	\$1,953,625

TABLE 4.
PROPOSED SEAMAP-GULF ACTIVITIES, 2022

	Fall	Winter	Spring	Summer
Resource Surveys:				
Spring Plankton Survey			X	
Shrimp/Groundfish Surveys	X			X
Fall Plankton Survey	X			
Plankton & Environmental Data Surveys	X	X	X	X
Bottom Longline Surveys	X		X	X
Vertical Longline Surveys			X	X
Information Operations:				
Biological and Environmental Atlas				X
Joint Annual Report		X		
Data Input and Request Processing	X	X	X	X
Specimen Archiving and Loan	X	X	X	X
Real-time Data Summaries				X
Program Administration:	X	X	X	X