

An analysis of environmental monitoring programs in the Gulf of Mexico

Project Summary

Building on previous efforts by USGS and others, Ocean Conservancy is cataloging environmental, biological and oceanographic monitoring programs in the Gulf of Mexico. The aim is twofold: 1) to identify and characterize existing programs that might be integrated into a comprehensive, long-term (>20 years) Deepwater Horizon (DWH) oil spill monitoring program that would track the status and recovery of injured natural resources and services, and changes in marine ecosystem drivers affecting recovery; and 2) to identify important gaps in existing Gulfwide surveys that would need to be filled to comprehensively monitor the status and recovery of injured natural resources. The primary users of this assessment are the DWH Oil Spill Natural Resource Trustees, but others who might find this useful for prioritizing oil spill impacts research or restoration planning are GoMRI, NAS, NFWF, and the RESTORE Act restoration programs.

Background

Existing Gulf of Mexico monitoring programs should lay the foundation for an integrated Gulfwide DWH oil spill monitoring program and will likely provide essential data needed to gauge the recovery of injured resources. In order to understand the existing extent of monitoring in the Gulf we are compiling information on the characteristics of Gulf monitoring programs such as spatial and temporal coverage, species monitored, sampling frequency and funding status. We recognize that our inventory will not be exhaustive but we want to ensure we have captured the most significant programs for this assessment. Our analysis will identify the relevant ecosystem components injured by the DWH oil spill that could be monitored through existing programs or that would need an expanded or new survey to track status and recovery. We will produce a geographic synthesis and gap analysis illustrating the spatial or taxonomic scope of Gulf ecosystem monitoring programs from the coast to the offshore environment and from Texas to Florida. We will also identify key monitoring elements necessary for an integrated, Gulfwide DWH oil spill monitoring program built on a foundation of both existing and new survey programs.

Consultations with Experts

We are at a point in this project where we are continuing to meet with experts to share initial results, determine whether anyone else is doing similar inventory, identify potential collaborators, and discuss ideas for communicating the information to make it most useful for potential users.

Draft Summary

Below is a draft summary of the long-term monitoring inventory database for discussions and contributions to planning. Please note this inventory is not complete. A few categories are not included here. A small subset of the database fields are included. The full list of fields in the database are provided on page 29.

Bird Long-term Monitoring Programs (In Progress)

<u>Program</u>	<u>Ecosystem Metrics</u>	<u>Start</u>
Coastal Bird Conservation Program	locate breeding pairs, certain species of beach nesting birds including Wilson's and snowy plovers, American oyster catchers, and least terns.	2005
Research project	northern gannets	2004
Audubon coastal bird survey	Citizen science coastal surveys during key migratory and winter periods.	2010

Draft Summary June 4, 2014

Deepwater Community Long-term Monitoring Programs

<u>Program</u>	<u>Ecosystem Metrics</u>	<u>Start</u>
National Institute for Undersea Science and Technology (NIUST) seafloor hydrates research observatory	<i>dynamics and impacts of gas hydrate deposits through experiments, hydrocarbon reservoir monitoring, migration of subbottom fluids, fluid venting to the water column, and associated microbial and/or chemosynthetic community structures</i>	2003

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Human Use Long-term Monitoring Programs

<u>Program</u>	<u>Ecosystem Metrics</u>	<u>Start</u>
Vessel Operating Units	number of >5 net ton commercially fishing vessels and the characteristics of them	1979
Menhaden Product Reports	##	##
Menhaden Logbooks	time and duration of every purse-seine set, the location, weather conditions and the estimated number of fish caught in each set	1983
Fish and Wildlife Research Institute catch-and-effort Status and Trends	catch-and-effort data	1992
Coastal Logbooks	effort by trip, location and dealer where landed, date trip was landed, type/quantity of gear, statistical block fished, depth fished, total species weight, number of discards by species	1990 (various dates for different fisheries, see notes)
SEFSC Trip Interview Program	size, age, cpue, species composition of catch, area fished, gear, quantity of gear, fishing time	1983
GulfFin Biological Sampling	16 recreationally important species. species composition, length, age.	2002
Gulf Shrimp System	shrimp amount, value, trip location, trip effort	1956
Menhaden	Captains Daily Fishing Report (CDFR) - time, duration, location, weather, estimated number of fish of each set. Dockside - vessels selected randomly, then 10 fish randomly - length, weight, ageing. Landings	Port samples and landings 1964, CDFR early 1980's
Shrimp Observer Program	bycatch composition by trawl gear type. Includes measures of length, species composition, weight, tags. (ageing, reproductive state and genetics as requested)	1992-2007 voluntary, >2007 mandatory
Bottom Long Line Observer Program	catch, bycatch, discards and gear used in the shark bottom longline fishery, effort	1994

Gillnet Observer Program	shark and mackerel catch and bycatch of gillnet fishery. Species composition, length, weight, Tag ID, gear detail, presence of seabirds, marine mammals and sea turtles	1993
Gulf of Mexico Vertical Line Observer Program	species composition, tagging ID, weight, length, bycatch, effort	2006
Menhaden Observer Program	species composition, tagging ID	2011
Vessel Monitoring System Pelagic Longline	effort location, target species, fishing gear, return port, and estimated time of landing	2002
Vessel Monitoring System Pelagic Longline	effort location, target species, fishing gear, return port, and estimated time of landing	2002
Large Pelagic Logbooks	effort by set, species composition, bycatch, gear, protected species interactions, landing and offload dates, number of discards by species, total species weight	1986
Dealer Historical Landings Report	##	##
Dealer Commercial Landings	##	##
Dealer Trip Ticket Reports, Florida	species composition, amount of catch (landings) and effort	1986 officially; data collection began late 1984
Dealer Trip Ticket Reports, Alabama	species composition and amount of catch landings	2001
Dealer Trip Ticket Reports, Mississippi	species composition and amount of catch landings	2003
Dealer Trip Ticket Reports, Louisiana	species composition and amount of catch landings	1999
Dealer Trip Ticket Reports, Texas	species composition and amount of catch landings	1986
GulfFIN/Marine Rec. Information Program (MRIP)	16 recreationally important species	2002
SEFSC Headboat Survey	Estimated landings and angler effort annually (March of following year), biological data (mean size, age, sex)	1986
TX Parks & Wildlife Department Marine Sport Harvest Program (CREEL Surveys)	all landed species length, landings and effort	1974 (with current design since 1983)
SEFSC Headboat Logbooks	logbook data including trip information, catch and discards; fish length, age, weight and sex.	1972
National Listing of Fish Advisories	chemical contamination screening where sport,	1993

	subsistence, and/or commercial fishing is conducted. Two-phase intensive studies of problem areas identified in screening studies to determine the magnitude of contamination in edible portions of commonly cons	

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Marine Fish Long-term Monitoring Programs

<u>Program</u>	<u>Ecosystem Metrics</u>	<u>Start</u>
Gillnet Observer Program	shark and mackerel catch and bycatch of gillnet fishery. Species composition, length, weight, Tag ID, gear detail, presence of seabirds, marine mammals and sea turtles	1993
Dealer Trip Ticket Reports, Florida	species composition, amount of catch (landings) and effort	1986 officially; data collection began late 1984
Dealer Commercial Landings	##	##
Dealer Historical Landings Report	##	##
Menhaden Logbooks	time and duration of every purse-seine set, the location, weather conditions and the estimated number of fish caught in each set	1983
Large Pelagic Logbooks	effort by set, species composition, bycatch, gear, protected species interactions, landing and offload dates, number of discards by species, total species weight	1986
Mississippi Department of Marine Resources and Gulf Coast Research Laboratory Fishery Independent Sampling	composition, from subsample - length, min & max length, weight by species. Temp, salinity and Do at each location	varies by method - Trawl (1974) Seine (1974), Beam plankton net (1974) Gillnet (2005)
Gulf of Mexico States Shark Pupping and Nursery Area (GULFSPAN)	identify which shark species use which coastal ecosystems, gauge the relative importance of these areas, and determine migration and distribution patterns of neonate and juvenile sharks.	2003
Fishery-Independent Surveys	determine distribution patterns and map food webs in Alabama's coastal marine ecosystem	
Gulf of Mexico Vertical Line Observer Program	species composition, tagging ID, weight, length, bycatch, effort	2006
SEFSC Trip Interview Program	size, age, cpue, species composition of catch, area fished, gear, quantity of gear, fishing time	1983
Bottom Long Line Observer Program	catch, bycatch, discards and gear used in the shark bottom longline fishery, effort	1994

Shrimp Observer Program	bycatch composition by trawl gear type. Includes measures of length, species composition, weight, tags. (ageing, reproductive state and genetics as requested)	1992-2007 voluntary, >2007 mandatory
Dealer Trip Ticket Reports, Alabama	species composition and amount of catch landings	2001
Coastal Logbooks	effort by trip, location and dealer where landed, date trip was landed, type/quantity of gear, statistical block fished, depth fished, total species weight, number of discards by species	1990 (various dates for different fisheries, see notes)
DISL & UWF Monitoring PAHs in coastal sharks	Monitoring PAHs in coastal sharks in northern Gulf of Mexico. Archived liver tissue samples from sharks	2006
Menhaden	Captains Daily Fishing Report (CDFR) - time, duration, location, weather, estimated number of fish of each set. Dockside - vessels selected randomly, then 10 fish randomly - length, weight, ageing. Landings	Port samples and landings 1964, CDFR early 1980's
Apalachicola National Estuarine Research Reserve juvenile fish and benthic macroinvertebrates monitoring	of juvenile fish and benthic macroinvertebrates	
GulfFin Biological Sampling	16 recreationally important species. species composition, length, age.	2002
Menhaden Observer Program	species composition, tagging ID	2011
Southeast Area Monitoring and Assessment Program - Gulf of Mexico Inshore Longline Survey	sharks and finfish, environmental data	2008
FOCAL (Fisheries Oceanography of Coastal Alabama)	ichthyoplankton and zooplankton seasonality, abundances, cross-shelf distributions and vertical distributions	2004
Dealer Trip Ticket Reports, Mississippi	species composition and amount of catch landings	2003
Fish and Wildlife Research Institute catch-and-effort Status and Trends	catch-and-effort data	1992
Florida Fish and Wildlife Conservation Commission Fishery Independent Monitoring	Temp, DO, salinity, pH, conductivity, habitat descriptors, species composition, all fish and select macroinvertebrates, species subset randomly measured and all counted. Type, amount, and ratio of bycatch. Latitude, longitude, weather, tide, secchi disk.	Trawls(1989), 21.3-m Seines (1989), 183-m Seines (1996)
Alabama Marine Resources Division Fishery Independent Sampling	adult length & weight, length (subsample), weight of entire subsample by species. Temp, salinity, DO at each location. Gillnet - species of interest - ovary weight, sex, otolith extraction	1981, gillnet (2001)

Louisiana Department of Wildlife and Fisheries Fishery Independent Sampling	relative abundance, and seasonal and long term trends in marine organisms. size distribution from subsample	varies by method - Trawl (1967) Seine (1986) Gillnet (1986)
Southeast Area Monitoring and Assessment Program - Gulf of Mexico Vertical Longline Survey	reef fish	2010
Southeast Area Monitoring and Assessment Program - Gulf of Mexico Reef Fish Survey	relative abundance and population estimates of reef fish	1992
Southeast Area Monitoring and Assessment Program - Gulf of Mexico Fall, Winter & Spring Plankton Survey	occurrence, abundance, geographical and vertical distribution - early life stages of winter spawning fishes and Atlantic bluefin tuna larvae	1981
SEFSC Headboat Logbooks	logbook data including trip information, catch and discards; fish length, age, weight and sex.	1972
National Listing of Fish Advisories	chemical contamination screening where sport, subsistence, and/or commercial fishing is conducted. Two-phase intensive studies of problem areas identified in screening studies to determine the magnitude of contamination in edible portions of commonly cons	1993
TX Parks & Wildlife Department Marine Sport Harvest Program (CREEL Surveys)	all landed species length, landings and effort	1974 (with current design since 1983)
SEFSC Headboat Survey	Estimated landings and angler effort annually (March of following year), biological data (mean size, age, sex)	1986
GulfFIN/Marine Rec. Information Program (MRIP)	16 recreationally important species	2002
Menhaden Product Reports	##	##
Southeast Area Monitoring and Assessment Program - Gulf of Mexico Fall & Summer Shrimp/Groundfish Survey and environmental sampling	demersal organism and eggs/larvae of commercially and recreationally important species abundance & distribution, major finfish and shrimp species length-frequency measurements, and environmental data	1981
Dealer Trip Ticket Reports, Louisiana	species composition and amount of catch landings	1999
TX Parks & Wildlife Department Fishery Independent Sampling	relative abundance, size (subsample), species composition (>5 mm Total Length), and temporal and spatial distribution of various life history stages of fish and invertebrates. Surface salinity, temp, DO and turbidity. (Bottom included with trawls) start/e	1975
Dealer Trip Ticket Reports, Texas	species composition and amount of landings	1986

Marine Mammal Long-term Monitoring Programs

<u>Program</u>	<u>Ecosystem Metrics</u>	<u>Start</u>
Sperm Whale Acoustic Monitoring Program (SWAMP) and Sperm Whale Seismic Study	documenting a baseline on "usual" behavior of sperm whales in the Gulf of Mexico related to understanding the effects of seismic exploration, genetic analyses, photo identification/surface behavior and to characterize habitat use. Also CTD, ADCP, expend	2000
FWC Manatee Salvage and Rescue Program	verify injured or dead manatees; aid in rescue and carcass salvage, determine cause of death	1974
Institute for Marine Mammal Studies (IMMS) Bottlenose dolphin surveys	Bottlenose dolphin movement, site fidelity, population size, behavior, water quality conditions, habitat suitability	2004
Institute for Marine Mammal Studies (IMMS) Bottlenose dolphin health assessments	Hematology, microbiology, endocrinology, morphometrics	1978
SEFSC Aerial Surveys	Multi-year aerial surveys of nearshore waters of SE Florida coast, including Florida Keys and all of Florida Bay are being conducted, which provide opportunistic sightings of bottlenose dolphins that can be used as rough estimates of their relative abundance	1992
Institute for Marine Mammal Studies (IMMS) Bottlenose dolphin strandings	Spatial, temporal, and demographic patterns in strandings, level A data collection	1984
Sirenia Project Manatee Health Assessments	long-term, detailed studies on the life history, population dynamics, and ecological requirements of the West Indian manatee	2006
Seismic Survey Mitigation Measures and Marine Mammal Observer Reports	visual accounts of marine mammals and sea turtles by species and distance from operations	2002
Florida Fish and Wildlife Conservation Commission Winter Synoptic Surveys	Statewide aerial surveys and ground counts occur to count wintering manatees. They identify number of animals observed in wintering sites at time of count, and so suggest that there is at least this number of manatees in population. Additionally, photo-ID	1991
Marine Mammal Health and Stranding Response Program	stranding network responses/investigations of mortality events, ingestion and entanglement rates	1992
SEAMAP (Southeast Area)	3 ship-based surveys conducted yearly	1982

Monitoring and Assessment Program) Spring Plankton Surveys	(winter, spring, and fall); data on marine mammals are also collected during spring surveys	
Population ecology of West Indian manatees in Alabama waters	DISL's Manatees Sighting Network, photo-identification, aerial and ground surveys, tagging and tracking manatee movements, habitat and food resource characterization, analysis of population data and comparison to habitat and food supply data	1985
Manatee Individual Photo-Identification System (MIPS)	process images, identify manatees, and manage an integrated sightings database	1978
Sperm whale satellite tagging project to examine range of movement.	Satellite tagging sperm whales in Gulf of Mexico.	2002
SEFSC Ship Surveys	Ship surveys used to assess abundance and distribution of cetaceans in oceanic northern GOM. Visual line-transect surveys are conducted in combination with acoustics surveys (day and night using towed hydrophone arrays and sonobuoys), biopsy samples (for	1991
Sarasota Dolphin Research Program Dolphin	Bottlenose dolphin photoidentification surveys, mark-recapture abundance estimates, and radio tracking in Sarasota Bay (and during some years in St. Joseph Bay). Also comparing dolphins at oiled sites (Barataria Bay and Mississippi Sound)) to non-oiled s	Behaviour - 1970, population vital rates - 1980, sex age, morphometrics, life history - 1984, body conditions - 1986, blood chemistry and hematology 1987, contaminants analyses - 1988, microbiology, diagnostic ultrasound - 1990, urinalysis - 1993

**Nearshore Sediment and Resources Long-term Monitoring Programs
(In Progress)**

<u>Program</u>	<u>Ecosystem Metrics</u>	<u>Start</u>
Gulf Shrimp System	shrimp amount, value, trip location, trip effort	1956
Menhaden	Captains Daily Fishing Report (CDFR) - time, duration, location, weather, estimated number of fish of each set. Dockside - vessels selected randomly, then 10 fish randomly - length, weight, ageing. Landings	Port samples and landngs 1964, CDFR early 1980's
Bottom Long Line Observer Program	catch, bycatch, discards and gear used in the shark bottom longline fishery, effort	1994
Gillnet Observer Program	shark and mackerel catch and bycatch of gillnet fishery. Species composition, length, weight, Tag ID, gear detail, presence of seabirds, marine mammals and sea turtles	1993
Gulf of Mexico Vertical Line Observer Program	species composition, tagging ID, weight, length, bycatch, effort	2006
Southeast Area Monitoring and Assessment Program - Gulf of Mexico Inshore Longline Survey	sharks and finfish, environmental data	2008
Menhaden Logbooks	time and duration of every purse-seine set, the location, weather conditions and the estimated number of fish caught in each set	1983
Shrimp Observer Program	bycatch composition by trawl gear type. Includes measures of length, species ocmposition, weight, tags. (ageing, reproductive state and genetics as requested)	1992-2007 voluntary, >2007 mandatory
Menhaden Observer Program	species composition, tagging ID	2011
Vessel Monitoring System Pelagic Longline	effort location, target species, fishing gear, return port, and estimated time of landing	2002
Vessel Monitoring System Pelagic Longline	effort location, target species, fishing gear, return port, and estimated time of landing	2002
Dealer Trip Ticket Reports, Florida	species composition, amount of catch (landings) and effort	1986 officially; data collection began late 1984
Dealer Trip Ticket Reports, Alabama	species composition and amount of catch landings	2001
Dealer Trip Ticket Reports, Mississippi	species composition and amount of catch landings	2003
Dealer Trip Ticket Reports, Louisiana	species composition and amount of catch	1999

	landings	
Dealer Trip Ticket Reports, Texas	species composition and amount of catch landings	1986
GulfFIN/Marine Rec. Information Program (MRIP)	16 recreationally important species	2002
SEFSC Headboat Survey	Estimated landings and angler effort annually (March of following year), biological data (mean size, age, sex)	1986
TX Parks & Wildlife Department Marine Sport Harvest Program (CREEL Surveys)	all landed species length, landings and effort	1974 (with current design since 1983)
SEFSC Headboat Logbooks	logbook data including trip information, catch and discards; fish length, age, weight and sex.	1972
Southeast Area Monitoring and Assessment Program - Gulf of Mexico Fall & Summer Shrimp/Groundfish Survey and environmental sampling	demersal organism and eggs/larvae of commercially and recreationally important species abundance & distribution, major finfish and shrimp species length-frequency measurements, and environmental data	1981
Southeast Area Monitoring and Assessment Program - Gulf of Mexico Fall, Winter & Spring Plankton Survey	occurrence, abundance, geographical and vertical distribution - early life stages of winter spawning fishes and Atlantic bluefin tuna larvae	1981
Southeast Area Monitoring and Assessment Program - Gulf of Mexico Reef Fish Survey	relative abundance and population estimates of reeffish	1992
Southeast Area Monitoring and Assessment Program - Gulf of Mexico Vertical Longline Survey	reef fish	2010
TX Parks & Wildlife Department Fishery Independent Sampling	relative abundance, size (subsample), species composition (>5 mm Total Length), and temporal and spatial distribution of various life history stages of fish and invertebrates. Surface salinity, temp, DO and turbidity. (Bottom included with trawls) start/e	1975
Louisiana Department of Wildlife and Fisheries Fishery Independent Sampling	relative abundance, and seasonal and long term trends in marine organisms. size distribution from subsample	varies by method - Trawl (1967) Seine (1986) Gillnet (1986)
Mississippi Department of Marine Resources and Gulf Coast Research Laboratory Fishery Independent Sampling	composition, from subsample - length, min & max length, weight by species. Temp, salinity and Do at each location	varies by method - Trawl (1974) Seine (1974), Beam plankton net (1974)

		Gillnet (2005)
Alabama Marine Resources Division Fishery Independent Sampling	adult length & weight, length (subsample), weight of entire subsample by species. Temp, salinity, DO at each location. Gillnet - species of interest - ovary weight, sex, otolith extraction	1981, gillnet (2001)
Florida Fish and Wildlife Conservation Commission Fishery Independent Monitoring	Temp, DO, salinity, pH, conductivity, habitat descriptors, species composition, all fish and select macroinvertebrates, species subset randomly measured and all counted. Type, amount, and ratio of bycatch. Latitude, longitude, weather, tide, secchi disk.	Trawls(1989), 21.3-m Seines (1989), 183-m Seines (1996)
FOCAL (Fisheries Oceanography of Coastal Alabama)	ichthyoplankton and zooplankton seasonality, abundances, cross-shelf distributions and vertical distributions	2004
Environmental Monitoring & Assessment Program	monitor and assess the status and trends of national ecological resources and ecological status of surface waters. physical habitat, nutrients and other commonly measured field parameters, and biological communities (algae, benthic invertebrates, and fish	1990
NOAA's Bioeffects program	distribution and concentration of over 100 chemical contaminants in sediments, measure sediment toxicity, and assess the condition of bottom-dwelling biological communities	1986
Fishery-Independent Surveys	determine distribution patterns and map food webs in Alabama's coastal marine ecosystem	
DISL & UWF Monitoring PAHs in coastal sharks	Monitoring PAHs in coastal sharks in northern Gulf of Mexico. Archived liver tissue samples from sharks	2006
Apalachicola National Estuarine Research Reserve juvenile fish and benthic macroinvertebrates monitoring	of juvenile fish and benthic macroinvertebrates	
Apalachicola National Estuarine Research Reserve juvenile fish and benthic macroinvertebrates monitoring	oyster growth	
Apalachicola National Estuarine Research Reserve juvenile fish and benthic macroinvertebrates monitoring	of juvenile fish and benthic macroinvertebrates	

Apalachicola National Estuarine Research Reserve juvenile fish and benthic macroinvertebrates monitoring	oyster growth	
Florida Department of Environmental Protection CAMA Aquatic Preserve Monitoring	Coral Monitoring - determine the distribution and abundance of the species	2006
Florida Keys National Marine Sanctuary Coral Reef Evaluation and Monitoring Project	current population status of elkhorn coral, live coral cover and species richness, basic population statistics (coral recruitment and mortality)	1996
Florida Keys National Marine Sanctuary Seagrass Monitoring Project		
NOAA's Southeast Fisheries Science Center population status of elkhorn coral	population status of elkhorn coral and to better understand the primary threats or stressors affecting its recovery (coral recruitment and mortality). Subset - sources and severity of coral tissue loss, which includes prevalence and impact of disease, phy	2004
Dauphin Island Sea Lab Oyster Habitat Assessment	Reef location, Sampling Date (day, month, year), Site water temperature (oC), Site salinity (psu), Gear type used (quadrats, seines, gillnets, RTK), Fish ID (species), Fish TL (mm), Species biomass (g), Oyster and associated infauna counts (spat, seed, sa	2003
GCRL Oyster Assessment and Monitoring	assess total number and size per reef, Mapping of oyster resources in Mississippi	
Coastwide Reference Monitoring System	monitor and evaluate the effectiveness of CWPPRA projects at the project, region, and coastwide levels	2007

Oyster Long-term Monitoring Programs (*In Progress*)

<u>Program</u>	<u>Ecosystem Metrics</u>	<u>Start</u>
Mussel Watch	sediment and bivalve tissue chemistry for 140 organic and inorganic contaminants, bivalve histology, Clostridium perfringens (pathogen) concentrations	1986
Apalachicola National Estuarine Research Reserve juvenile fish and benthic macroinvertebrates monitoring	of juvenile fish and benthic macroinvertebrates	##
Apalachicola National Estuarine Research Reserve juvenile fish and benthic macroinvertebrates monitoring	oyster growth	##
Dauphin Island Sea Lab Oyster Habitat Assessment	Reef location, Sampling Date (day, month, year), Site water temperature (oC), Site salinity (psu), Gear type used (quadrats, seines, gillnets, RTK), Fish ID (species), Fish TL (mm), Species biomass (g), Oyster and associated infauna counts (spat, seed, sa	2003
GCRL Oyster Assessment and Moitoring	assess total number and size per reef, Mapping of oyster resources in Mississippi	##

Sea Turtle Long-term Monitoring Programs (*In Progress*)

<u>Program</u>	<u>Ecosystem Metrics</u>	<u>Start</u>
Alabama Sea Turtles		
Alligator Point Sea Turtle Patrol	Number of sea turtle nests and false crawls	
Anna Maria Turtle Watch and Shorebird Monitoring	Number of sea turtle nests and false crawls and hatchling productivity	
Bi-National Kemp's Ridley Recovery Program		##
Boca Grande Sea Turtle Conservancy	Number of sea turtle nests and false crawls and hatchling productivity	
Boca Grande Sea Turtle Conservancy / Gasparilla Island sea Turtle Patrol	Number of sea turtle nests and false crawls and hatchling productivity	
Clearwater Marine Aquarium	Number of sea turtle nests and false crawls and hatchling productivity	
Coastal Wildlife Club	Number of sea turtle nests and false crawls	
Coastwise Consulting	To capture live sea turtles using shrimp trawlers in association with hopper dredge activities along the southeastern U.S. coast and the Gulf of Mexico. Trawling may be conducted prior to dredging to assess the abundance of sea turtles in an area and/or d	2002
Collier County	Number of sea turtle nests and false crawls and hatchling productivity	Marco 1989, the others 1994
Conservancy of Southwest Florida	Number of sea turtle nests and false crawls	1985
Conservancy of Southwest Florida	The applicant proposes to take turtles from coastal waters of the Ten Thousand Islands, in southwest Florida. The purpose of this project is to characterize the essential habitat associations of subadult Kemp's ridley turtles in the nearshore waters of th	2001
Conservancy of Southwest Florida	Characterize aggregations of sea turtles in nearshore waters of Southwest Florida; The purpose of the proposed research activities is to characterize the aggregations of marine turtles in the nearshore waters of Lee County in southwest Florida. These are	(1997)2009
Conservancy of SW Florida		2009
Crystal River energy complex? Bruzek		1999
Dog Island Turtle Patrol	Number of sea turtle nests and false crawls	
Don Pedro Turtle Patrol	Number of sea turtle nests and false crawls and	

	hatchling productivity	
Dry Tortugas Sea Turtles		
East Coast Observers	Relocation trawling of sea turtles in conjunction with the US Army Corps of Engineers. Along the southeast US coast.	2006
FFWCC - Florida Marine Research Institute	The purpose of this project is to locate and describe areas of the Atlantic Ocean and Gulf of Mexico near Florida that serve as developmental habitat for pelagic-stage juvenile and neonate sea turtles, to quantify threats to pelagic sea turtles, and to ga	2005 (2009)
Florida Coastal Conservancy	Number of sea turtle nests and false crawls	
Florida Department of Environmental Protection - Apalachicola National Estuarine Research Reserve	Number of sea turtle nests and false crawls and hatchling productivity	
Florida Department of Environmental Protection - Florida Park Service - Ft Zachary Taylor State Park	Number of sea turtle nests and false crawls	Some started in mid-late 70's, but consistent 1989
Florida Department of Environmental Protection - Florida Park Service - Long Key State Park (Long Key Pt)	Number of sea turtle nests and false crawls	Some started in mid-late 70's, but consistent 1989
Florida Department of Environmental Protection - Florida Park Service - Anclote Key State Park	Number of sea turtle nests and false crawls	Some started in mid-late 70's, but consistent 1989
Florida Department of Environmental Protection - Florida Park Service - Bahia Honda State Park	Number of sea turtle nests and false crawls	Some started in mid-late 70's, but consistent 1989
Florida Department of Environmental Protection - Florida Park Service - Bald Point State Park	Number of sea turtle nests and false crawls	Some started in mid-late 70's, but consistent



		1989
Florida Department of Environmental Protection - Florida Park Service - Caladesi Island State Park	Number of sea turtle nests and false crawls	Some started in mid-late 70's, but consistent 1989
Florida Department of Environmental Protection - Florida Park Service - Cayo Costa State Park	Number of sea turtle nests and false crawls	Some started in mid-late 70's, but consistent 1989
Florida Department of Environmental Protection - Florida Park Service - Deer Lake State Park	Number of sea turtle nests and false crawls	Some started in mid-late 70's, but consistent 1989
Florida Department of Environmental Protection - Florida Park Service - Don Pedro State Park	Number of sea turtle nests and false crawls and hatchling productivity	Some started in mid-late 70's, but consistent 1989
Florida Department of Environmental Protection - Florida Park Service - Gasparilla Island State Park	Number of sea turtle nests and false crawls	Some started in mid-late 70's, but consistent 1989
Florida Department of Environmental Protection - Florida Park Service - Grayton Beach State Park	Number of sea turtle nests and false crawls	Some started in mid-late 70's, but consistent 1989
Florida Department of Environmental Protection - Florida Park Service - Henderson Beach State Park	Number of sea turtle nests and false crawls	Some started in mid-late 70's, but consistent



		1989
Florida Department of Environmental Protection - Florida Park Service - Honeymoon Island State Park	Number of sea turtle nests and false crawls	Some started in mid-late 70's, but consistent 1989
Florida Department of Environmental Protection - Florida Park Service - Long Key State Park	Number of sea turtle nests and false crawls	Some started in mid-late 70's, but consistent 1989
Florida Department of Environmental Protection - Florida Park Service - Lovers Key State Park	Number of sea turtle nests and false crawls	Some started in mid-late 70's, but consistent 1989
Florida Department of Environmental Protection - Florida Park Service - Perido Key State Park	Number of sea turtle nests and false crawls	Some started in mid-late 70's, but consistent 1989
Florida Department of Environmental Protection - Florida Park Service - St Andrews State Park	Number of sea turtle nests and false crawls	Some started in mid-late 70's, but consistent 1989
Florida Department of Environmental Protection - Florida Park Service - St George Island State Park	Number of sea turtle nests and false crawls	Some started in mid-late 70's, but consistent 1989
Florida Department of Environmental Protection - Florida Park Service - St Joe Peninsula State Park	Number of sea turtle nests and false crawls and hatchling productivity	Some started in mid-late 70's, but consistent



		1989
Florida Department of Environmental Protection - Florida Park Service - Topsail Hill State Park	Number of sea turtle nests and false crawls	Some started in mid-late 70's, but consistent 1989
Florida Department of Environmental Protection - Florida Park Service - Wiggins Pass State Park	Number of sea turtle nests and false crawls	Some started in mid-late 70's, but consistent 1989
Florida Fish and Wildlife Conservation Commission	The purpose of our research in SW Florida Bay is to monitor the abundance of loggerhead and green turtles; characterize the aggregations of loggerheads, Kemp's ridleys, and hawksbills; and determine the movements, behaviors, habitat-use, and reproductive	1990* Schroeder 2005 (2011)
Florida Index Nesting Beach Survey	measure seasonal productivity, allowing comparisons between beaches and between years	1996
Florida Index Nesting Beach Survey	measure seasonal productivity, allowing comparisons between beaches and between years	1996
Florida Statewide Nesting Beach Survey	total distribution, seasonality and abundance of sea turtle nesting in Florida	1979
Florida Statewide Nesting Beach Survey	total distribution, seasonality and abundance of sea turtle nesting in Florida	1979
Friends of the ARK	Number of sea turtle nests and false crawls	
Frinds of the matagordoa and aranzas refuges	Number of sea turtle nests and false crawls	
Frinds of the matagordoa and aranzas refuges	Number of sea turtle nests and false crawls	
Gulf specimen Marine Lab		1984
Incidental Take during ACOE dredgin operations		##
Incidental Take during ACOE dredgin operations		##
Institute of Marine Mammal Studies	Number of sea turtle nests and false crawls	2000
Institute of Maine Mammal Studies		2010



IMMS		
Inwater Research Group, Inc.	The applicant proposes to investigate the demographic composition and genetic origin of turtles within the Key West National Wildlife Refuge. This will be done by the capturing of green, loggerhead, Kemp's ridley, and hawksbill turtles with nets and by ha	2002 (2007) (2012)
Kemp's Ridley Sea Turtle Recovery Project	1978 - 1988 hatchling headstart program, 1986 nesting surveys to determine abundance of nests, nest productivity	1978
Kemp's Ridley Sea Turtle Recovery Project	1978 - 1988 hatchling headstart program, 1986 nesting surveys to determine abundance of nests, nest productivity	1978
Mote Marine Laboratory	Number of sea turtle nests and false crawls and hatchling productivity	1982
Mote Marine Laboratory	To conduct a five year population assessment of the juvenile sea turtles inhabiting Charlotte Harbor on the west coast of Florida. The researcher plans to capture green, Kemp's ridley, loggerhead and hawksbill sea turtles employing tangle net, encircling	2002
Mote Sea Turtle Monitoring	https://dspace.mote.org/dspace/	1982
Mote Sea Turtle Monitoring	https://dspace.mote.org/dspace/	1982
National Park Service	Number of sea turtle nests and false crawls	1994
National Park Service	Number of sea turtle nests and false crawls	1996
National Park Service	Number of sea turtle nests and false crawls	
National Park service	Number of sea turtle nests and false crawls	
National Park Service	Number of sea turtle nests and false crawls	
National Park Service	Number of sea turtle nests and false crawls	1994
Navarre Beach Sea Turtle Patrol	Number of sea turtle nests and false crawls	1993
NMFS Southeast Fisheries Center (SEFSC)	The applicant has requested a four year permit to take listed sea turtles in the coastal waters of the Atlantic Ocean and Gulf of Mexico. The research conducted in these areas support the National Marine Fisheries Service sea turtle recovery program.	2001 (2006)
NMFS Southeast Fisheries Center (SEFSC)		2008
Okaloosa Turtle Watch	Number of sea turtle nests and false crawls	
Padre Island National Seashore		1997
Panama City Beach Turtle Watch	Number of sea turtle nests and false crawls and hatchling productivity	1991/1997 Index Nesting

REMSA, Inc	The applicant has requested a five-year permit to take leatherback, green ,loggerhead, Kemp's ridley and green turtles from the Atlantic Ocean and Gulf of Mexico in conjunction with US Army Corps of Engineer Dredging projects for scientific research and e	2001
Rookery Bay NERR (Cocount doesn't exist anymore)	Number of sea turtle nests and false crawls	
Sanibel-Captiva Conservation Foundation	Number of sea turtle nests and false crawls and hatchling productivity	
Save a Turtle	Number of sea turtle nests and false crawls	
Sea Turtle and Fisheries Ecology Research Laboratory	Conducting studies on population status and recovery potential, habitat preference, movement and migration, foraging patterns, and impact of man's activities such as commercial and recreational fishing, dredging and habitat alteration/pollution. The Permi	1998
Sea Turtle Inc.	Number of sea turtle nests and false crawls	
Sea Turtle Stranding and Salvage Network	documentation of stranded sea turtles	1980
Sea Turtle Stranding and Salvage Network	documentation of stranded sea turtles	1980
Share the beach	Number of sea turtle nests and false crawls	2001
South Walton Turtle Watch	Number of sea turtle nests and false crawls	1995
Study of Loggerheads in Florida Bay		
Texas A&M Galveston	Number of sea turtle nests and false crawls	
The Gulf/East Bay Sea Turtle Patrol	Number of sea turtle nests and false crawls	
TNC Franklin Phipps Preserve	Number of sea turtle nests and false crawls	
Turtle Time Inc.	Number of sea turtle nests and false crawls	
U. S. Army Research and Development Center		2002
United States Air Force Patio Beach	Number of sea turtle nests and false crawls	
United States Air Force Residential Beach	Number of sea turtle nests and false crawls	
United States Fish and Wildlife Service	Number of sea turtle nests and false crawls and hatchling productivity	
United States Fish and Wildlife Service	Number of sea turtle nests and false crawls	
United States Geological Survey	Despite knowledge of general sea turtle nesting trends in the Dry Tortugas National Park (DRTO) (i.e., on Loggerhead Key, 65 miles due west of Key West), little information is available about in-water sea turtle use of natural resources.	2005 (2008) (2013)



University of Florida, Florida Cooperative Fish and Wildlife Research Unit	The applicant requests a three year permit to take juvenile and adult turtles along the St. Joseph Peninsula, in St. Joseph Bay, Florida. The applicant proposes to examine the inter-nesting movements and habitat usage of adult loggerhead turtles along the	2001
University of Alabama at Birmingham	The purpose of the research is to evaluate the abundance, movements, and location of juvenile sea turtles in the estuaries of Alabama, to potentially identify specific foraging areas. The presence of juvenile sea turtles in estuaries represents a potential	1999
University of Florida, Florida Cooperative Fish and Wildlife Research Unit	Assessment of sea turtle populations and habitat use in northwest Florida coastal embayments	2001
US Air Force	Number of sea turtle nests and false crawls	
US Air Force	Number of sea turtle nests and false crawls	
US Air Force	Number of sea turtle nests and false crawls	
US Fish and Wildlife Service	Number of sea turtle nests and false crawls	
USGS	Researchers will capture up to 106 green, 1 Kemp's ridley, 1 loggerhead, and 1 hawksbill sea turtles by tended pound-net or dip-net over the course of the three year permit. All turtles will be measured, weighed, blood sampled, flipper tagged, Passive Int	2005
USGS	Neritic sea turtles in the northern Gulf of Mexico: Ecology, genetic origin, and habitat use patterns	2013

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Ocean Conservancy

Shallow Water Coral Long-term Monitoring Programs

<u>Program</u>	<u>Ecosystem Metrics</u>	<u>Start</u>
Florida Keys National Marine Sanctuary Coral Reef Evaluation and Monitoring Project	<i>current population status of elkhorn coral, live coral cover and species richness, basic population statistics (coral recruitment and mortality)</i>	1996
Long-term Monitoring of the Flower Garden Banks	monitored the Flower Garden Banks coral reefs to detect any changes that may be caused by oil and gas activities. Coverage estimated. annual growth rates. <i>Diploria strigosa</i> lateral growth margins. reef community structure. temperature, salinity, dissolve...	1988
NOAA's Southeast Fisheries Science Center population status of elkhorn coral	population status of elkhorn coral and to better understand the primary threats or stressors affecting its recovery (coral recruitment and mortality). Subset - sources and severity of coral tissue loss, which includes prevalence and impact of disease, phy...	2004
FDEP CAMA St Joe Bay Aquatic Preserve Coral Monitoring	determine the distribution and abundance of the species	2006
Abundance, Distribution, and Condition of Acropora Corals, Other Benthic Coral Reef Organisms, and Marine Debris	surveyed the density, size, and condition of Acropora corals, other benthic coral reef organisms, including urchins, anemones, corallimorpharians, and mollusks, as well as marine debris abundance and impacts	1998



Shorelines Long-term Monitoring Programs (*In Progress*)

<u>Program</u>	<u>Ecosystem Metrics</u>	<u>Start</u>
National Wetland Inventory	map wetlands, project and report trends using probabilistic sampling	1974
Dauphin Island Sea Lab Evaluating Success and Function of Marsh (<i>Juncus roemerianus</i>) Restoration	<i>Juncus roemerianus</i> , black needlerush, marsh restoration, ecosystem services, morphology, physiology, colonization, salt marsh, vegetation, full density restoration, half density restoration, nitrogen, groundwater, nutrient filtration, NO ₃ ⁻ , top-down	2006

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Remaining Categories not shown here.

Submerged Aquatic Vegetation (*In Progress*)

Terrestrial Species (*In Progress*)

Water Column and Invertebrates (*In Progress*)

Water Quality (*In Progress*)

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Database Fields Collected for each Program

Category	General classification of monitoring program. The intent is to aide in sorting and searching spreadsheet for related monitoring programs.
Name	Name of monitoring program or effort
Program Website	URL of website describing the monitoring program
What	What is monitored (species, parameters, etc.)
Method	Sampling methods. Are different variables sampled using different methods? Include descriptions of all
Where	Where does sampling occur (geographic extent, ports, area represented)
Start	Program start date
Frequency	Sampling frequency and schedule. Are different variables sampled on different schedules? Include descriptions of all
End	Program end date
Discontinuities	Any significant discontinuities (e.g. missing years) in the data
Duration	Expected program duration (Is a program planned to last for a finite time period)
Funding	Funding source (agency, office or entity that provides funding to the monitoring program)
Funding Future	How long is program expected to be funded, if known
Who	Who conducts monitoring and has data
Spatial Data	Does this program have geospatial data (sampling locations, transects, survey tracks, etc)
Data Location	Where are data (i.e. where do data live -online, server, reports or office)
Data Available	Are geospatial data publically available
Data Format	What is the format of the datasets
Database	What, if any, database (e.g. NODC) are the data in
Data Acquired	Do we have geospatial data?
Contact	Program contact interviewed or available for further questions
Email	Contact's email address
Notes	Any additional notes about the monitoring program