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Glossary

alien species:	a species, subspecies, or lower taxon occurring outside of its natural range (past or present) and dispersal potential (i.e., outside the range it occupies naturally or could not occupy without direct or indirect introduction or care by humans) and includes any part, gametes, or propagule of such species that might survive and subsequently reproduce (IUCN 2000). Also referred to as non-native, non-indigenous, foreign, or exotic species.
allochthonous:	found in a place other than where they and their constituents were formed; derived from outside a system.
aquaculture:	the propagation and rearing of aquatic organisms in controlled or selected aquatic environments for any commercial, recreational, or public purpose.
atoll:	a horseshoe or circular array of reef islets, capping a coral reef system that encloses a lagoon, and perched around an oceanic volcanic seamount.
azooxanthellae:	corals without symbiotic photosynthesizing algae.
biodiversity:	the variability among living organisms from all sources including terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species, and of ecosystems (IUCN 2000).
bycatch:	fish which are harvested in a fishery, but which are not sold or kept for personal use, and includes economic discards and regulatory discards.
carrying capacity:	the maximum population size that can be regularly sustained by an environment; the point where the population's size levels off in the logistic growth model.
commercial fishing:	fishing in which the fish harvested, either in whole or in part, are intended to enter commerce or enter commerce through sale, barter, or trade.
coral:	species of the phylum Cnidaria, including: (A) all species of the orders Antipatharia (black corals), Scleractinia (stony corals), Gorgonacea (horny corals), Stolonifera (organpipe corals and others), Alcyonacea (soft corals), and Coenothecalia (blue coral), of the class Anthozoa; and (B) all species of the order Hydrocorallina (fire corals and hydrocorals) of the class Hydrozoa (16 U.S.C. 6409).
coral bleaching:	the process in which a coral polyp, under environmental stress, expels its symbiotic zooxanthellae from its body. The affected coral colony appears whitened.
coral reef:	any reefs or shoals composed primarily of corals (16 U.S.C. 6409).
coral reef ecosystem:	coral and other species of reef organisms (including reef plants) associated with coral reefs and the non-living environmental factors that directly affect coral reefs, that together function as an ecological unit in nature (16 U.S.C. 6409). The tropical and sub-tropical coral reef ecosystems include mangroves, seagrasses, and hard bottom communities, and warm water, light-dependent, hermatypic deep water shelf and slope corals that are typically found between 50 to 100 meters (m).
deep-sea coral:	azooxanthellate reef-like structures and/or thickets that occur deeper than 50 m, and comprise species of the phylum Cnidaria in the orders Antipatharia (black corals), Scleractinia (stony corals), Gorgonacea (horny corals), and Alcyonacea (soft corals), of the class Anthozoa, and in the order Hydrocorallina (hydrocorals). Also referred to as cold-water corals.
deep-sea coral ecosystem:	coral habitats that occur deeper than 50 m; are azooxanthellate (i.e., do not contain symbiotic algae); often consist of both reef-like structures and/or thickets, and other species of organisms associated with these deep-sea coral habitats, and the non-living environmental factors that directly affect deep-sea corals, that together function as an ecological unit in nature. Also referred to as cold-water coral ecosystems.

deep water coral:	any reefs composed primarily of light-dependent and hermatypic (or reef-building) corals that occur in deep water shoals and slopes between approximately 50 to 100 m. Deep water corals differ from “true” deep-sea corals, which are not light-dependent and occur at greater depths. Found in a depth range known as the “twilight zone.”
deep water coral ecosystem:	deep water coral and other species of reef organisms associated with light-dependent deep water coral reefs and the non-living environmental factors that directly affect coral reefs, that together function as an ecological unit in nature. Occur typically between 50 to 100 m in a depth range known as the “twilight zone.”
economic discards:	are targeted fish that aren’t retained because the harvester doesn’t want them (undesirable size, sex, quality, etc.).
ecosystem:	a geographically specified system of organisms, the environment, and the processes that control its dynamics. Humans are an integral part of an ecosystem.
ecosystem approach:	approach aimed at protecting, rebuilding, and conserving the structure and function of marine ecosystems.
ecosystem approach to management:	management approach that is adaptive, specified geographically, takes into account ecosystem knowledge and uncertainties, considers multiple external influences, and strives to balance diverse social objectives.
ecosystem restoration:	return of an ecosystem to a close approximation of its condition prior to disturbance; the reestablishment of predisturbance aquatic functions and related physical, chemical, and biological characteristics.
environment:	the biological, chemical, physical, and social conditions that surround organisms.
epizootic:	an outbreak of disease affecting many animals of one kind at the same time.
essential fish habitat:	those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.
exclusive economic zone:	the zone established by Presidential Proclamation 5030, dated March 10, 1983. The inner boundary of the zone is a line coterminous with the seaward boundary of each of the coastal states.
extramural partnership:	partnership carried on outside the bounds of NOAA.
fish:	finfish, mollusks, crustaceans, and all other forms of marine animal and plant life other than marine mammals and birds.
fishery:	one or more stocks of fish which can be treated as a unit for purposes of conservation and management and which are identified on the basis of geographical, scientific, technical, recreational, and economic characteristics. Also includes any fishing for such stocks.
fishery resource:	any fishery, any stock of fish, any species of fish, and any habitat of fish.
formal education:	learning that takes place in a structured educational system.
ghost fishing:	lost or derelict fishing gear that continues to catch fish and other species.
herbivore:	an animal that feeds on plants.
hermatypic:	reef-building.
informal education:	learning that takes place outside the established formal system but which meets clearly defined objectives through organized educational activities. Informal education may be voluntary and self-directed (e.g., a museum of aquarium exhibit), or systematic and guided (e.g., field trips).
intentional species introduction:	an introduction made deliberately by humans, involving the purposeful movement of a species outside of its natural range and dispersal potential. Such introductions may be authorized or unauthorized.

invasive species:	an alien species which becomes established in natural or semi-natural ecosystems or habitats, is an agent of change, and threatens native biological diversity.
marine biotechnology:	biological techniques used in applied research and product development of marine living organisms. In particular, the use by industry of recombinant DNA, cell fusion, and new bioprocessing techniques; any technology that is applied to marine living organisms to make them more valuable to humans.
marine debris:	something broken or destroyed, located in the sea, which refuses to go away (i.e., trash not readily biodegradable, including fishing nets, metals, plastics, and rubber products).
marine protected area:	any area of the marine environment that has been reserved by Federal, state, territorial, commonwealth, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein.
marine reserve:	an area protected from extractive uses (i.e., no-take area).
native species:	a species, subspecies, or lower taxon occurring within its natural range (past or present) and dispersal potential (i.e. within the range it occupies naturally or could occupy without direct or indirect introduction or care by humans). Also referred to as indigenous species.
overfishing:	a rate or level of fishing mortality that jeopardizes the capacity of a fishery to produce the maximum sustainable yield on a continuing basis.
photosynthetically active radiation:	those wavelengths of light (i.e., 400 to 700 nm) that can be absorbed by chlorophyll or other light harvesting pigments as part of the photosynthetic process. It is commonly known by its acronym, PAR.
recreational fishing:	fishing for sport or pleasure.
regulatory discards:	fish (targeted or not) required by regulation to be discarded, or to be retained, but not sold.
resiliency:	the return of a coral reef ecosystem to a state in which living, reef-building corals play a prominent functional role, after this role has been disrupted by a stress or perturbation (UNEP 1999).
species introduction:	the movement, by human actions, of a species, subspecies, or lower taxon (including any part, gametes, or propagule that might survive and subsequently reproduce) outside its natural range (past or present). This movement can be either within a country or between countries.
stakeholder:	an individual or a group with a particular interest, or stake, in the management and functioning of a given resource. Coral reef stakeholders include fishers, recreational users, those whose livelihoods depend on coral reefs (related to tourism, fishing, and coastal development), researchers, and students. Also referred to as "constituent" or "user."
stressor:	a physical, chemical, or biological factor that adversely affects organisms; an agent, condition, or similar stimulus that causes stress to an organism.
twilight zone:	zone between 60 to 150 m for coral reef habitats. The corals that subsist in this environment are adapted to low light conditions and colder water, and are referred to as deep water corals.
unintentional introduction:	an unintended introduction made as a result of a species utilizing humans or human delivery systems as vectors for dispersal outside its natural range (IUCN 2000).
U.S. Pacific Remote Insular Areas:	islands and reefs appurtenant to such island, reef or atoll, as applicable: Baker Island, Howland Island, Jarvis Island, Johnston Atoll, Kingman Reef, Wake Island, Rose Atoll and Palmyra Atoll.
zooxanthellae:	a group of dinoflagellates living endosymbiotically in association with one of a variety of invertebrate groups (e.g., corals, sponges). In corals, they provide carbohydrates through photosynthesis, as a source of energy for the coral polyps. They also provide coloration for corals.

Appendix A: Additional Supporting Documents

- Australian Institute of Marine Science. 2003. AIMS Research Plan: 2003-2006.
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Appendix B: Developing The Research Plan

In an effort to provide coastal and ocean managers with the most up-to-date scientific information, the NOAA Coral Reef Conservation Program developed the *NOAA Coral Reef Ecosystem Research Plan* to identify priority research needs and guide NOAA-funded coral reef ecosystem research for FY 2007 through FY 2011, including research conducted through extramural partners, grants, and contracts. The Plan draws mostly from information found in workshop reports, technical reports, and peer-reviewed articles, with extensive input from regional scientists both directly and indirectly (through reviews of the Plan).

The Process

As a first step, a steering committee was created to guide the development of the Plan. The Steering Committee consisted of representatives from the four line offices in NOAA with coral reef interests, i.e., the National Environmental, Satellite, and Data Information Service, the National Marine Fisheries Service, the National Ocean Service, and the Office of Oceanic and Atmospheric Research, with the latter two serving as co-chairs. Through the Steering Committee, a process was designed and agreed upon to be comprised of three major drafts (Drafts #1-3) with three levels of review (Reviews #1-3). Review 1 would be an internal NOAA review of Draft #1; Review 2 would be a review of Draft #2 conducted by NOAA and its external partners, including other Federal, state, territorial, commonwealth, and local agencies, USCRF members, and fisheries management councils; and Review 3 would be a formal request for comments on Draft #3 announced in the Federal Register.

Drafting the Document

Draft #1 of the Plan was drafted internally using the sources mentioned above. It was distributed for review to NOAA programs with an interest in coral reef ecosystems. Based on comments received on Draft #1, we found the Plan had well-developed national research priorities, but

poorly-defined regional research priorities. Because the national and regional priorities were in different stages of maturity, we split the Plan into: Part I: National Research Priorities and Part II: Regional Priorities. This allowed both parts to continue development in parallel, but on different timelines. Part I was written at a general level and consequently was less complicated. Because of this Part I proceeded at a faster pace. Part II was written at a much finer level of detail and was targeted for use by regional scientists and managers, thus its development was significantly more complex. As a result, Part II was developed by working through the USCRF points of contact.

For Draft #2 of Part II, the USCRF point of contact in each jurisdiction, in coordination with NOAA, determined the most expeditious and transparent way to develop their region's research priorities. Because each jurisdiction is unique; the process used to develop the regional sections was modified to suit the jurisdiction. For example: in the Hawaiian Islands, it was decided that the most inclusive way to plan their section was by organizing a group meeting of regional scientists, resource managers, and stakeholders. At this meeting, they decided to create separate working groups for the Northwestern and Main Hawaiian Islands to develop research priorities targeting the information needs of resource managers. Whereas, the management objectives and research needs in the Flower Garden Banks section were identified by the Flower Garden Banks National Marine Sanctuary staff.

Drafts #3 for Parts I and II were announced in the Federal Register for public comment on June 9, 2005 (NOAA 2005d) and April 8, 2006 (NOAA 2006b), respectively.

The final published version of the Plan will be printed as a single volume with two sections: Part I: National Research Priorities and Part II: Regional Research Priorities.

Appendix C: Requirement Drivers

Coastal Zone Management Act (16 U.S.C. 1451 et seq.)

The Coastal Zone Management Act encourages states to develop land and water use programs for the purpose of controlling coastal water pollution from land use activities. Section 303 calls for “the protection of natural resources, including wetlands, floodplains, estuaries, beaches, dunes, barrier islands, coral reefs, and fish and wildlife and their habitat within the coastal zone.”

Coral Reef Conservation Act of 2000 (16 U.S.C. 6401 et seq.)

The Coral Reef Conservation Act charges the Administrator of NOAA to preserve, sustain, and restore the condition of coral reef ecosystems; promote the wise management and sustainable use of coral reefs; develop sound scientific information on the condition and threats to coral reefs; support conservation programs; and provide financial resources for coral reef conservation and management projects. The Act requires the development of a National Coral Reef Action Strategy; a coral reef conservation grants program; a partnership with a nonprofit organization to collect and allocate monetary donations from the private sector for coral reef conservation projects; an emergency assistance program; a national program conducting conservation activities that may include mapping, assessment, monitoring, and scientific research for sustainable use and long-term conservation of coral reef ecosystems that is consistent with other Federal regulations; and effectiveness reports for the grants program and national program.

Endangered Species Act (16 U.S.C. 460 et seq.)

The Endangered Species Act requires that the Secretary of Commerce list any species that is threatened with extinction in all or a significant portion of its range and designate critical habitat for that species.

Executive Order 13089: Coral Reef Protection (1998)

E.O. 13089 directs all Federal agencies whose actions may affect U.S. coral reef ecosystems to “(1) identify their actions that may affect coral reef ecosystems; (2) utilize their programs and authorities to protect and enhance the conditions of such ecosystems; and (3) to the extent permitted by law, ensure that any actions they authorize, fund, or carry out will not degrade the conditions of coral reef ecosystems.” This E.O. gives specific direction to Federal agencies to implement measures to research, monitor, manage, and restore affected ecosystems, including efforts to reduce impacts of pollution, sedimentation, and fishing. It also established the USCRTF, which includes the Federal agencies with primary responsibility for coral reef resources and the affected U.S. states, territories, and commonwealths.

Executive Order 13112: Invasive Species (1999)

E.O. 13112 requires Federal agencies, to the extent practicable and permitted by law, to prevent the introduction and spread of invasive species. E.O. 13112 creates the Invasive Species Council and states that it shall be chaired jointly by the Secretaries of Commerce, Interior, and Agriculture. The Invasive Species Council is required to provide national leadership on invasive species and prepare and issue a National Invasive Species Management Plan.

Executive Order 13158: Marine Protected Areas (2000)

E.O. 13158 establishes a program in NOAA to identify and coordinate national marine protected areas for natural and cultural resources. The order calls for Federal agencies to use science-based identification and prioritization of natural and cultural resource protection.

Executive Order 13178: Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve (2000)

E.O. 13178 establishes the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve to ensure the comprehensive, strong, and lasting protection of the coral reef ecosystem and related marine resources and species of the Northwestern Hawaiian Islands. The order established Reserve Preservation Areas, where extractive uses are prohibited.

Government Performance and Results Act of 1993 (31 U.S.C. 1115 et seq.)

GPRA holds Federal agencies accountable for using resources wisely and achieving program results. GPRA requires agencies to develop plans for what they intend to accomplish, measure how well they are doing, make appropriate decisions based on the information they have gathered, and communicate information about their performance to Congress and the public.

Magnuson-Stevens Fisheries Conservation and Management Act (16 U.S.C. 1801 et seq.)

The Magnuson-Stevens Fisheries Conservation and Management Act establishes exclusive Federal management authority over fishery resources of the Exclusive Economic Zone. It is the principal law governing fishery resources of the United States. Section 2(a) states “this program is necessary to prevent overfishing, to rebuild overfished stocks, to ensure conservation, to facilitate long-term protection of essential fish habitats, and to realize the full potential of the Nation’s fishery resources.”

**Marine Turtle Conservation Act of 2004
(16 U.S.C. 6601 et seq.)**

The Marine Turtle Conservation Act assists in the conservation of marine turtles and the nesting habitats of marine turtles in foreign countries by supporting and providing financial resources for projects to conserve the nesting habitats, conserve marine turtles in those habitats, and address other threats to the survival of marine turtles.

Marine Mammal Protection Act (16 U.S.C. 1361 et seq.)

The Marine Mammal Protection Act generally prohibits taking and importation of all marine mammals, except under limited exceptions. The Marine Mammal Protection Act of 1972 was reauthorized in 1994, and found that certain species and population stocks of marine mammals are, or may be in danger of extinction or depletion as a result of human activities, and that such species and population stocks should not be permitted to diminish beyond the point at which they cease to be a significant functioning element; measures should be taken immediately to replenish any species or population stock which has diminished below its optimum sustainable level; and there is inadequate knowledge of the ecology and population dynamics of such marine mammals and of the factors which bear upon their ability to reproduce themselves successfully.

National Action Plan to Conserve Coral Reefs (2000)

The National Action Plan presents a cohesive national strategy to reverse the worldwide decline and loss of coral reefs. Conservation actions focus on understanding coral reef ecosystems and the natural and anthropogenic processes determining their health and viability and reducing the adverse impacts of human activities.

National Coral Reef Action Strategy (2002)

The National Action Strategy was developed in accordance with the requirements of the Coral Reef Conservation Act to provide information on major threats and needs in each region; identify priority actions needed to achieve the goals outlined in the National Action Plan and the Coral Reef Conservation Act; and track progress in achieving these goals and objectives. The National Action Strategy directs NOAA and its partner agencies to map, monitor, and research coral reef ecosystem resources, including increasing the understanding of the social and economic factors of conserving coral reefs.

National Marine Sanctuaries Act (16 U.S.C. 1431 et seq.)

The National Marine Sanctuaries Act established a Federal program that recognizes areas of the marine environment with special conservation, recreational, ecological, historical, cultural, archaeological, scientific, educational, or aesthetic qualities as National Marine Sanctuaries to improve conservation, understanding, management, and wise and sustainable use of marine resources.

Presidential Proclamation: Establishment of the Northwestern Hawaiian Islands Marine National Monument (2006)

The Northwestern Hawaiian Islands Marine National Monument has been set aside as a national monument by Presidential Proclamation. The area includes the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve, the Midway NWR, the Hawaiian Islands NWR, and the Battle of Midway National Memorial. The proclamation protects a dynamic reef ecosystem that is home to many species of coral, fish, birds, marine mammals, and other flora and fauna including the endangered Hawaiian monk seal, the threatened green sea turtle, and the endangered leatherback and hawksbill sea turtles. Additionally, this area has great cultural significance to Native Hawaiians and a connection to early Polynesian culture. The proclamation establishes the first national monument in which the Department of Commerce has the primary responsibility regarding management of the marine areas, in consultation with the Department of the Interior. The Department of the Interior will have sole responsibility for Midway Atoll NWR, the Battle of Midway National Memorial, and the Hawaiian Islands NWR (Bush 2006).

The State of Coral Reef Ecosystems of the United States and Pacific Freely Associated States (2002, 2005)

National assessments of the condition of U.S. coral reefs identifying the pressures that pose increasing risks to reefs, particularly in certain "hot spots" located near population centers. The report also assesses the health of reef resources, ranks threats in 13 geographic areas, and details mitigation efforts. The report is produced biennially to document the health of U.S. coral reef ecosystems.

U.S. Coral Reef Task Force Initiative: Local Action Strategies (2005-2007)

In 2002, the USCRTF adopted the "Puerto Rico Resolution" which calls for the development of three-year local action strategies by each of the seven member U.S. states, territories and commonwealths. These local action strategies are locally-driven roadmaps for collaborative and cooperative action among Federal, state, territory, and non-governmental partners which identify and implement priority actions needed to reduce key threats to valuable coral reef resources. The goals and objectives of the local action strategies are linked to those found in the National Action Plan to Conserve Coral Reefs, adopted by the USCRTF in 2000. Florida, Hawaii, Guam, the U.S. Virgin Islands, American Samoa, Puerto Rico, and the Commonwealth of the Northern Mariana Islands created specific local action strategies for select locally relevant threats, using the six priority focus areas (i.e., overfishing, land-based sources of pollution, recreational overuse and misuse, lack of public awareness, climate change and coral bleaching, and disease) as a guide.

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