3.14 Resources Considered but Dismissed from Further Analysis

NEPA and the CEQ regulations direct agencies to prepare NEPA documents that are "concise, clear, and to the point" (40 CFR Part 1500.2(b)). NEPA reviews should focus on important environmental issues and avoid "amassing needless detail" (1500.1(b)). Environmental analysis should focus on significant issues (meaning pivotal issues, or issues of critical importance), discussing insignificant issues only briefly (1500.4(c)). Furthermore, agencies are directed to discuss impacts in proportion to their significance, and if the impacts are not deemed significant there should be only enough discussion to show why more study is not warranted (1502.2(b)).

In those cases where impacts from the Proposed Action are not anticipated or are expected to be imperceptible or nondetectable, resources are dismissed from detailed analysis. Four such resources were identified and the rationale for their dismissal is provided below.

3.14.1 Air and Water Quality

NOS considered two resources, air quality and water quality, with regard to discharges from equipment used in NOS projects. Analyzing air quality as a resource considers atmospheric conditions such as the concentration of criteria air pollutants and GHGs. Analyzing water quality as a resource considers aquatic conditions such as the concentration of dissolved solids and DO, acidity, and temperature. Vessels and aircraft would emit a variety of criteria air pollutants including nitrogen oxides (NOx), sulfur oxides (SOx), particulate matter, volatile organic compounds (VOCs), carbon monoxide (CO), and GHG emissions (e.g., CO_2). Vessels would also discharge treated sanitary and domestic wastes from USCG-approved Marine Sanitation Devices (MSDs) and could potentially spill oil, fuel, or chemicals into the water.

The potential impacts to air and water quality from air emissions, wastewater discharges, and accidental spills are minimized through compliance with comprehensive maritime protocols, namely the MARPOL 73/78 Annexes. **Table 3.14-1** summarizes each applicable MARPOL 73/78 annex by pollution source, its title, U.S. signatory status, and implementing legislation, law and/or regulations, or applicable Coast Guard guidance.

Table 3.14-1. MARPOL Annexes Applicable to Vessels

Annex	Pollution Source	Title	U.S. Signatory*	Implementation Legislation/ Regulations/Guidance
I	Oil	Regulations for the Prevention of Pollution by Oil	Yes	• Act to Prevent Pollution from Ships of 1980 (APPS) 33 U.S.C. § 1901 – 1912 • 33 CFR Parts 151,155, 156, 157 • Marine Safety Manual, Vol. II • Navigation and Vessel Inspection Circular (NVIC) No. 6-94 • CG-PCV Policy Letter No. 06-01 • CG-3PCV Policy Letter No. 06-09 • CG-MOC Policy Letter No. 04-11, Rev. 1

Annex	Pollution Source	Title	U.S. Signatory*	Implementation Legislation/ Regulations/Guidance
IV	Sewage	Regulations for the Prevention of Pollution by Sewage from Ships	No	• Clean Water Act (CWA) 33 U.S.C. § 1251 et seq. • Federal Water Pollution Control Act (FWPCA) (as amended by the CWA) • 33 CFR 159 • Marine Safety Manual, Vol. II • NVIC No. 01-09
V	Garbage	Regulations for the Prevention of Pollution by Garbage from Ships	Yes	• APPS 33 U.S.C. § 1901 – 1912 • 33 CFR 151 • Marine Safety Manual, Vol. II
VI	Air	Regulations for the Prevention of Air Pollution from Ships	Yes	• APPS 33 U.S.C. § 1901 – 1912 • 44 U.S.C. § 7401-7671 • 40 CFR 94 • CG-543 Policy Letter No. 09-01 • CG-CVC Policy Letter No. 12-04 • USCG & EPA Revised Protocols on Referrals under MARPOL Annex VI as implemented by APPS (effective 03/04/2015)

Source: USCG, No Date

*Indicates whether the U.S. has agreed to comply with this annex. In the case of sewage, the CWA applies to vessels even though the U.S. is not a signatory to the annex.

NOS adheres to NOAA's environmental procedures which comply with MARPOL 73/78 and relevant air and water quality implementing legislation, regulations, and guidance listed in the above table. For example, discharge restrictions for vessel waste and emissions management include handling all hazardous and regulated materials in accordance with applicable laws and appropriately training crew members in materials storage and usage. In addition, NOS projects are dispersed throughout the action area, which would minimize any impact from air emissions and wastewater discharges from a single vessel or aircraft. NOS vessels also represent only a negligible portion of total oceanic vessel traffic, and any resulting impacts produced would be indistinguishable from those produced by all other vessels within the action area. Therefore, potential impacts from emissions and wastewater discharges on air and water quality are generally expected to be imperceptible or nondetectable and is not analyzed further. However, where relevant, the effects from accidental leakage or spillage of oil, fuel, and chemicals, and air emissions from project vessel engines is briefly analyzed where the impacts may be detectable in the context of other resources. For example, the impact of accidental leaks on Sea Turtles is discussed in Section 3.6.2.2.4 and the impact of air emissions on Sea Turtles is discussed in Section 3.6.2.2.7.

3.14.2 Soils and Geology

Impacts to soils and geological resources occur primarily in terrestrial areas and tend to be from activities that come in direct contact with them. NOS projects are predominantly aquatic actions that infrequently come into contact with terrestrial areas. Smaller scale activities associated with installation, maintenance, and removal of land-based tide gauges and GPS stations do require access to terrestrial areas. However,

the disturbance resulting from these activities is minimal and impacts to soils and geology would be imperceptible or nondetectable. As such, potential impacts to soils and geology as a resource are not analyzed further.

3.14.3 Airborne Noise for Human Receptors

A noise is an undesirable sound, one that interferes with communication, is intense enough to damage hearing, or is otherwise intrusive. The main source of airborne noise associated with NOS projects is the operation of vessel engines. Noise could also be generated from airplanes occasionally used in survey activities, flying overhead as well as taking off and landing on landing strips, and floatplanes taking off and touching down on water surfaces.

Airborne noise from vessels used by NOS close to shore would generally be imperceptible or nondetectable to nearby human receptors given the ambient noise of other boat and ship traffic. The acoustic signature of vessels used by NOS would be indistinguishable from other sources of noise near docks, marinas, and ports. While at sea, the airborne noise of vessels used by NOS would be perceptible, but would not be a source of concern given the distance to the human environment. Sound produced by underwater acoustic equipment is outside of the range of human hearing and is not transmitted between water and air; therefore, these sounds are imperceptible to humans in water or air.

Noise from flyovers, take-offs, and landings of fixed-wing aircraft associated with NOS projects would be perceptible by human observers, but very infrequent, localized, and short in duration.

For the reasons presented above, the impact of airborne noise from NOS projects on human receptors is not expected to be perceptible or detectable or of concern. Therefore, potential impacts of airborne noise on human receptors are not analyzed further.

3.14.4 Select Freshwater Taxa

NOS projects may include activities within U.S. freshwater bodies, such as the U.S. portion of the Great Lakes and major lakes such as Tahoe, Mead, Champlain, Okeechobee, and parts of major rivers such as the Mississippi, Missouri, Hudson, and Columbia. Impacts to many freshwater species have been analyzed in the Fish, Birds, and Aquatic Macroinvertebrates resource sections. However, there may be a small number of NOS projects that occur in other freshwater bodies where select freshwater taxa such as amphibians, mammals, and reptiles occur. Analysis of impacts for these select freshwater taxa was not carried forward for the following reasons.

NOS projects within freshwater bodies would occur far less frequently than in marine environments. For example, from 2016 to 2021, less than 3 percent of NOS projects occurred in freshwater bodies.

Based on a preliminary analysis, some stressors are likely to cause adverse, negligible impacts, including vessel presence, vessel wake, and accidental spills. The nature of these impacts is very similar to those analyzed in the Fish, Birds, Marine Mammals, and Aquatic Macroinvertebrates resource sections. The remaining stressors analyzed in this Final PEIS are not likely to affect these select freshwater taxa or are expected to be de minimis. The resulting incremental impacts would not be any greater than those already experienced by other freshwater species.

Project specific reviews would be conducted to determine if any select freshwater ESA-listed species are present in a project area; if those ESA-listed species are identified, NOS would then consult with the

USFWS or NMFS, as applicable. Therefore, potential impacts to these freshwater species are not analyzed further in this Final PEIS.

3.15 Relationship Between Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity

Section 102(C)(iv) of NEPA and 40 CFR 1502.16 require an EIS to address the relationship between local short-term uses of the human environment and the maintenance and enhancement of long-term productivity. This involves the consideration of whether a proposed action is sacrificing environmental resources in the long term for some short-term value to the project proponent or the public.

Many of the proposed NOS surveying and mapping projects may cause short-term adverse impacts on resources including marine/aquatic wildlife and habitats. However, these impacts are generally predicted to be minor and temporary and thus would not lead to any lasting effects.

The Proposed Action would provide the public and private sectors with nautical charts, benthic habitat condition maps, current and tide charts, and other products necessary for safe navigation, economic security, and environmental sustainability. The data collected by NOS are used to conserve, preserve, and restore ecological resources, including marine/aquatic wildlife and habitat, coral reefs, and cultural and historic resources. The data allow federal, state, and local governments to make informed decisions about fishing areas and other natural resource management issues. Thus, the Proposed Action provides long-term, beneficial effects to environmental resources. None of the alternatives would entail short-term uses of the environment that would compromise, impair, or reduce long-term environmental productivity.

3.16 Irreversible and Irretrievable Commitments of Resources

Section 102(C)(v) of NEPA requires an EIS to address "any irreversible and irretrievable commitments of resources which would be involved in the Proposed Action should it be implemented." Irreversible and irretrievable commitments of resources refer to losses to or impacts on natural resources that cannot be recovered or reversed.

Irreversible commitments of resources are those that cannot be regained. "Irreversible" applies mainly to the effects from use or depletion of nonrenewable resources, such as fossil fuels or cultural resources, or to factors such as soil productivity that are renewable only over long periods of time. Under Alternatives A, B, and C, the use of non-renewable energy sources would be an irreversible commitment of resources. Non-renewable energy consumption would occur via the combustion of fossil fuels (diesel fuel) in vessels used by NOS. However, the amount of fossil energy consumed would represent a minute fraction of that consumed annually by the nation's governmental, commercial, and recreational boat and shipping fleet. It would be an even smaller fraction of the nation's aggregate annual fossil fuel consumption.

Irretrievable commitments of resources are those that are lost for a period of time, but not permanently. No irretrievable commitments of resources are expected from implementation of the Proposed Action.

3.17 Unavoidable Adverse Impacts

Section 102(2)(c)(ii) of NEPA requires that an EIS include information on "any adverse environmental effects which cannot be avoided should the proposed action be implemented." Unavoidable adverse impacts are the effects on the human environment that would remain after mitigation measures and best practices have been applied. They do not include temporary or permanent impacts that would be mitigated. While these impacts do not have to be avoided by the planning agency, they must be disclosed, considered, and mitigated where possible (40 CFR § 1500.2[e]). All three alternatives (A, B, and C) of the Proposed Action would have the same unavoidable adverse impacts but to different degrees because the level of effort differs. Alternative B would have slightly greater unavoidable adverse impacts than

Alternative A, and Alternative C would have slightly greater unavoidable adverse impacts than Alternatives B and A.

The Proposed Action would entail unavoidable adverse impacts on marine and aquatic habitats; marine mammals; sea turtles; fish; aquatic macroinvertebrates; EFH; and seabirds, shorebirds, coastal birds, and waterfowl. While unavoidable, these adverse impacts would mostly vary from negligible to minor; they would not be significant adverse impacts. For the marine and aquatic organisms in particular, the unavoidable adverse impacts would result mostly from underwater noise through the operation of vessel engines and use of underwater acoustic equipment. There would also be a low level of unavoidable adverse impacts from disturbance due to presence and associated sight, smell, and sound of humans and their equipment in remote locations where wildlife populations are unaccustomed to human intrusion and encroachment.

The Proposed Action would also entail unavoidable adverse impacts to cultural and historic resources and environmental justice. These unavoidable adverse impacts would range from negligible to moderate in overall magnitude but would still be insignificant. Cultural and historic resources subjected to unavoidable impacts would include submerged cultural or historic resources, coastal infrastructure, viewsheds of nearshore historic properties and designed cultural landscapes, and subsistence hunting and fishing areas including Traditional Cultural Properties. Unavoidable adverse environmental justice impacts would mostly be related to potential effects of the Proposed Action on subsistence hunting, fishing, and other traditional harvests.

In summary, while the Proposed Action would entail the potential for unavoidable adverse impacts on a variety of resources, none of these impacts would be significant.

3.18 Comparison of Impacts

Table 3.18-1 compares the environmental consequences for Alternatives A, B, and C. For each resource analyzed in Sections 3.4 through 3.13, the impacts are summarized by impact causing factor and by alternative overall.

Table 3.18-1. Summary Comparison of Impacts

Resource	Alternative A: No Action – Conduct Surveys and Mapping for Coastal and Marine Data Collection with Current Technology and Methods, at Current Funding Levels	Alternative B: Conduct Surveys and Mapping with Equipment Upgrades, Improved Hydroacoustic Devices, and New Tide Stations	Alternative C: Upgrades and Improvements with Greater Funding Support
Habitats	Impacts to habitats from water column disruptions under Alternative A would continue to be **adverse** and **negligible.** Impacts to habitats from activities involving physical disturbance to bottom substrate; sedimentation, turbidity, and chemical contaminants; increased ambient underwater sound levels; and onshore activities under Alternative A would continue to be **adverse** and **negligible** to **minor.** The impact on habitats from invasive species dispersal facilitated by activities under Alternative A would likely continue to be **adverse** and **minor.** Impacts to habitat areas resulting from Alternative A would not cause	Impacts of Alternative B on habitats throughout the action area would be the same or slightly, but not appreciably, larger than those that would occur under Alternative A for each impact causing factor. Impacts to habitat areas resulting from Alternative A would not cause long-term changes in the availability of space, shelter, cover, or nutrients necessary for dependent species and would not substantially increase in intensity with the increased level of effort of Alternative B. Overall, impacts to habitats under Alternative B would be **adverse**, **minor**, and **insignificant**.	Impacts of Alternative C on habitats throughout the action area would be the same or slightly, but not appreciably, larger than those under Alternatives A and B for each impact causing factor. Impacts to habitat areas resulting from Alternatives A and B would not cause long-term decreases in the availability of space, shelter, cover, or nutrients necessary for dependent species and would not substantially increase in intensity with the increased level of effort of Alternative C. Overall, impacts to habitats under Alternative C would be **adverse**, **minor**, and **insignificant**.

Resource	Alternative A: No Action – Conduct Surveys and Mapping for Coastal and Marine Data Collection with Current Technology and Methods, at Current Funding Levels	Alternative B: Conduct Surveys and Mapping with Equipment Upgrades, Improved Hydroacoustic Devices, and New Tide Stations	Alternative C: Upgrades and Improvements with Greater Funding Support
	long-term changes in the availability of space, shelter, cover, or nutrients necessary for dependent species. Overall, impacts to habitats under Alternative A would continue to be **adverse, minor**, and **insignificant.**		
Marine Mammals	Impacts on marine mammals (cetaceans, pinnipeds, sirenians, and fissipeds) from trash and debris and air emissions under Alternative A would continue to be **adverse** and **negligible.** Impacts from human activity under Alternative A would continue to be **adverse** and **negligible** on cetaceans and sirenians and **adverse** and **minor** on pinnipeds and fissipeds**.** Impacts on marine mammals (cetaceans, pinnipeds, sirenians, and fissipeds) from accidental oil, fuel, or chemical spills under Alternative A would continue to be **adverse** and **negligible** to **minor.** Impacts on marine mammals (cetaceans, pinnipeds, sirenians, and	Impacts of Alternative B on marine mammals would be the same or slightly, but not appreciably, larger than those that would occur under Alternative A for each impact causing factor. Impacts to marine mammals resulting from Alternative A would be temporary or short-term and would not be considered outside the natural range of variability of species' populations, their habitats, or the natural processes sustaining them. These impacts would not substantially increase in intensity with the increased survey effort of Alternative B. Overall, impacts of Alternative B on marine mammals, including ESA-listed species, and habitat, including	Impacts of Alternative C on marine mammals would be the same or slightly, but not appreciably, larger than those that would occur under Alternatives A and B for each impact causing factor. Impacts to marine mammals resulting from Alternatives A and B would be temporary or short-term and would not be considered outside the natural range of variability of species' populations, their habitats, or the natural processes sustaining them. These impacts would not substantially increase in intensity with the increased survey effort of Alternative C. Overall, impacts of Alternative C on marine mammals, including ESA-

Resource	Alternative A: No Action – Conduct Surveys and Mapping for Coastal and Marine Data Collection with Current Technology and Methods, at Current Funding Levels	Alternative B: Conduct Surveys and Mapping with Equipment Upgrades, Improved Hydroacoustic Devices, and New Tide Stations	Alternative C: Upgrades and Improvements with Greater Funding Support
	fissipeds) from active underwater acoustic sources, vessel and equipment sound, vessel presence and movement of equipment in the water under Alternative A would continue to be **adverse** and **minor.** Impacts on pinnipeds and fissipeds from air emissions under Alternative A would continue to be **adverse** and **negligible**. Although a vessel strike is very unlikely, debilitating injury or mortality of one or a few individuals could occur and impacts would be **adverse** and **moderate,** or greater if an ESA-listed species is affected. If a walrus stampede occurs due to vessel or aircraft disturbance, the impact could be **adverse** and **moderate** or greater. If polar bears are disturbed at denning sites or if polar bear-human interactions occur, the impact could be **adverse** and **moderate**. Potential impacts from underwater acoustic sources include injury exposures in the form of hearing loss	designated critical habitat, would be **adverse, minor,** and **insignificant.**	listed species, and habitat, including designated critical habitat, would be **adverse, minor,** and **insignificant.**

Resource	Alternative A: No Action – Conduct Surveys and Mapping for Coastal and Marine Data Collection with Current Technology and Methods, at Current Funding Levels	Alternative B: Conduct Surveys and Mapping with Equipment Upgrades, Improved Hydroacoustic Devices, and New Tide Stations	Alternative C: Upgrades and Improvements with Greater Funding Support
	(PTS) on cetaceans, but such injury would be rare and confined to a few individual high-frequency cetaceans. It would also include behavioral disruption exposures of cetaceans, pinnipeds, sirenians and fissipeds, but the amount of time individuals may exceed the behavioral exposure threshold would be on average less than a few minutes. Impacts to marine mammals resulting from Alternative A would be temporary or short-term and would not be considered outside the natural range of variability of species' populations, their habitats, or the natural processes sustaining them. Overall, impacts of Alternative A on marine mammals, including ESA-listed species, and habitat, including designated critical habitat, would continue to be **adverse, minor,** and **insignificant.**		
Sea Turtles	Impacts to sea turtles and their habitats from active underwater acoustic sources, vessel and equipment sound, and onshore	Impacts of Alternative B on sea turtles and their habitats would be the same or slightly, but not appreciably, larger than those that	Impacts of Alternative C on sea turtles and their habitats would be the same or slightly, but not appreciably, larger than those that

Resource	Alternative A: No Action – Conduct Surveys and Mapping for Coastal and Marine Data Collection with Current Technology and Methods, at Current Funding Levels	Alternative B: Conduct Surveys and Mapping with Equipment Upgrades, Improved Hydroacoustic Devices, and New Tide Stations	Alternative C: Upgrades and Improvements with Greater Funding Support
	activities under Alternative A would continue to be **adverse** and **negligible.** Impacts to sea turtles and their habitats from vessel presence and movement, underwater activities, and air emissions under Alternative A would continue to be **adverse** and **negligible** to **minor.** Impacts to sea turtles and their habitats from accidental oil, fuel, or chemical spills would continue to be **adverse** and **negligible** to **minor.** Although the effects of impact causing factors on sea turtles and their habitats range from **negligible** to **moderate**, moderate impacts could occur in the very unlikely event of an accidental spill of oil, fuel, or chemicals. Likewise, in the very unlikely event of a vessel strike, injury or death to sea turtles would also constitute a **moderate** or greater impact. Impacts to sea turtles resulting from Alternative A would not cause long-	would occur under Alternative A for each impact causing factor. Impacts to sea turtles resulting from Alternative A would not cause long-term changes in habitat availability and use, sea turtle behavior, or energy expenditures and would not substantially increase in intensity with the increased survey effort of Alternative B. Overall, impacts on sea turtles and their habitat, including designated critical habitat, would be **adverse, minor,** and **insignificant**.	would occur under Alternatives A and B for each impact causing factor. Impacts to sea turtles resulting from Alternatives A and B would not cause long-term changes in habitat availability and use, sea turtle behavior, or energy expenditures and would not substantially increase in intensity with the increased survey effort of Alternative C. Overall, impacts on sea turtles and their habitat, including designated critical habitat, would be **adverse, minor,** and **insignificant.**

Resource	Alternative A: No Action – Conduct Surveys and Mapping for Coastal and Marine Data Collection with Current Technology and Methods, at Current Funding Levels	Alternative B: Conduct Surveys and Mapping with Equipment Upgrades, Improved Hydroacoustic Devices, and New Tide Stations	Alternative C: Upgrades and Improvements with Greater Funding Support
	term changes in habitat availability and use, sea turtle behavior, or energy expenditures. Overall, impacts under Alternative A on sea turtles and their habitats, including designated critical habitat, would continue to be **adverse, minor,** and **insignificant.**		
Fish	Impacts to fish and their habitats from vessel wake and turbulence; vessel sound; accidental spill of oil, fuel, or chemicals; and disturbance of the ocean/lake/river bottom under Alternative A would continue to be **adverse** and **negligible** to **minor.** Impacts to fish and their habitats from active underwater acoustic sources and air emissions under Alternative A would continue to be **adverse** and **minor.** Impacts to fish resulting from Alternative A may include some stress responses without permanent physiological damage, and may disturb breeding, feeding, or other activities but without any impacts on	Under Alternative B, impacts on fish and fish habitat would be the same or slightly, but not appreciably, larger than those that would occur under Alternative A for each impact causing factor. Impacts to fish resulting from Alternative A may include some stress responses without permanent physiological damage, and may disturb breeding, feeding, or other activities but without any impacts on population levels; additionally, there would not be long-term changes in habitat availability and use or in fish behavior. These impacts would not substantially increase in intensity with the	Impacts of Alternative C on fish and fish habitat would be the same or slightly, but not appreciably, larger than those that would occur under Alternatives A and B for each impact causing factor. Impacts to fish resulting from Alternatives A and B may include some stress responses without permanent physiological damage, and may disturb breeding, feeding, or other activities but without any impacts on population levels; additionally, there would not be long-term changes in habitat availability and use or in fish behavior. These impacts would not substantially increase in intensity

Resource	Alternative A: No Action – Conduct Surveys and Mapping for Coastal and Marine Data Collection with Current Technology and Methods, at Current Funding Levels	Alternative B: Conduct Surveys and Mapping with Equipment Upgrades, Improved Hydroacoustic Devices, and New Tide Stations	Alternative C: Upgrades and Improvements with Greater Funding Support
	population levels; additionally, there would not be long-term changes in habitat availability and use or in fish behavior. Overall, impacts of Alternative A on fish, including ESA-listed species, and fish habitat, including designated critical habitat, would continue to be **adverse, minor,** and **insignificant.**	increased survey effort of Alternative B. Overall, impacts of Alternative B on fish, including ESA-listed species, and fish habitat, including designated critical habitat, would be **adverse, minor,** and **insignificant.**	with the increased survey effort of Alternative C. Overall, impacts of Alternative C on fish, including ESA-listed species, and fish habitat, including designated critical habitat, would be **adverse, minor,** and **insignificant.**
Aquatic Macroinvertebrates	Impacts to aquatic macroinvertebrates and their habitats from underwater acoustic sources, vessel sound, and air emissions under Alternative A would continue to be **adverse** and **negligible.** Impacts to aquatic macroinvertebrates and their habitats from vessel wake and underwater turbulence; accidental spill of oil, fuel, or chemicals; and disturbance of the ocean/lake/river bottom under Alternative A would continue to be **adverse** and **negligible** to **minor.** Overall, impacts of Alternative A on aquatic macroinvertebrates, including ESA-listed species, and habitats,	Under Alternative B, impacts on aquatic macroinvertebrates and their habitats would be the same or slightly, but not appreciably, larger than those that would occur under Alternative A for each impact causing factor. These impacts would not substantially increase in intensity with the increased survey effort of Alternative B. Overall, impacts of Alternative B on aquatic macroinvertebrates, including ESA-listed species, and habitats, including designated critical habitat, would be **adverse, minor,** and **insignificant.**	Under Alternative C, impacts on aquatic macroinvertebrates and their habitats would be the same or slightly, but not appreciably, larger than those that would occur under Alternatives A and B for each impact causing factor. These impacts would not substantially increase in intensity with the increased survey effort of Alternative C. Overall, impacts of Alternative C on aquatic macroinvertebrates, including ESA-listed species, and habitats, including designated critical habitat, would be **adverse, minor,** and **insignificant.**

Resource	Alternative A: No Action – Conduct Surveys and Mapping for Coastal and Marine Data Collection with Current Technology and Methods, at Current Funding Levels	Alternative B: Conduct Surveys and Mapping with Equipment Upgrades, Improved Hydroacoustic Devices, and New Tide Stations	Alternative C: Upgrades and Improvements with Greater Funding Support
	including designated critical habitat, would continue to be **adverse, minor,** and **insignificant.**		
Essential Fish Habitat (EFH)	Impacts to EFH from disturbance of the water column under Alternative A would continue to be **adverse** and **negligible.** Impacts to EFH from physical impacts to bottom habitat; increase in sedimentation, turbidity, or chemical contamination; dispersal of invasive species; and increase in ambient sound under Alternative A would continue to be **adverse** and **negligible** to **minor.** Impacts to EFH resulting from Alternative A would be infrequent, geographically widely distributed, and likely to elicit a minimal or temporary response from prey species or cause short-term changes to physical characteristics (i.e., changes in water quality). Overall, impacts of Alternative A on EFH would continue to be **adverse, minor,** and i**nsignificant.**	Under Alternative B, impacts on EFH would be the same or slightly, but not appreciably, larger than those that would occur under Alternative A for each impact causing factor. Impacts to EFH resulting from Alternative A would be infrequent, geographically widely distributed, and likely to elicit a minimal or temporary response from prey species or cause short-term changes to physical characteristics (i.e., changes in water quality). These impacts would not substantially increase in intensity with the increased survey effort of Alternative B. Overall, impacts of Alternative B on EFH would be **adverse, minor,** and **insignificant**.	Under Alternative C, impacts on EFH would be the same or slightly, but not appreciably, larger than those that would occur under Alternatives A and B for each impact causing factor. Impacts to EFH resulting from Alternatives A and B would be infrequent, geographically widely distributed, and likely to elicit a minimal or temporary response from prey species or cause short-term changes to physical characteristics (i.e., changes in water quality). These impacts would not substantially increase in intensity with the increased survey effort of Alternative C. Overall, impacts of Alternative C on EFH would be **adverse, minor,** and **insignificant**.

Resource	Alternative A: No Action – Conduct Surveys and Mapping for Coastal and Marine Data Collection with Current Technology and Methods, at Current Funding Levels	Alternative B: Conduct Surveys and Mapping with Equipment Upgrades, Improved Hydroacoustic Devices, and New Tide Stations	Alternative C: Upgrades and Improvements with Greater Funding Support
Seabirds, Shorebirds and Coastal Birds, and Waterfowl	Impacts to birds and their habitats from active underwater acoustic sources and vessel and equipment sound under Alternative A would continue to be **adverse** and **negligible.** Impacts to birds and their habitats from aircraft sound, vessel presence and movement, underwater activities, onshore activities, and air emissions under Alternative A would continue to be **adverse** and **negligible** to **minor.** Impacts to birds and their habitats from accidental oil, fuel, or chemical spills would continue to be **adverse** and **minor** to **moderate.** Although the effects of impact causing factors on birds and their habitats range from **negligible** to **moderate**, moderate impacts could occur in the very unlikely event of an accidental spill of oil, fuel, or chemicals. Likewise, in the very unlikely event of a vessel strike, injury or death to birds could constitute greater impacts.	Under Alternative B, impacts on birds and their habitats would be the same or slightly, but not appreciably, larger than those that would occur under Alternative A for each impact causing factor. Impacts to birds resulting from Alternative A would generally persist only for the duration of an activity and would not be expected to cause any long-term changes in habitat use and availability or energy expenditure outside of the natural range of variation. These impacts would not substantially increase in intensity with the increased survey effort of Alternative B. Overall, impacts on of Alternative B on birds, including ESA-listed species, and habitats, including designated critical habitat, would be **adverse, minor,** and **insignificant.**	Under Alternative C, impacts on birds and their habitats would be the same or slightly, but not appreciably, larger than those that would occur under Alternatives A and B for each impact causing factor. Impacts to birds resulting from Alternatives A and B would generally persist only for the duration of an activity and would not be expected to cause any long-term changes in habitat use and availability or energy expenditure outside of the natural range of variation. These impacts would not substantially increase in intensity with the increased survey effort of Alternative C. Overall, impacts on of Alternative C on birds, including ESA-listed species, and habitats, including designated critical habitat, would be **adverse, minor,** and **insignificant.**

Resource	Alternative A: No Action – Conduct Surveys and Mapping for Coastal and Marine Data Collection with Current Technology and Methods, at Current Funding Levels	Alternative B: Conduct Surveys and Mapping with Equipment Upgrades, Improved Hydroacoustic Devices, and New Tide Stations	Alternative C: Upgrades and Improvements with Greater Funding Support
	Impacts to birds resulting from Alternative A would generally persist only for the duration of an activity and would not be expected to cause any long-term changes in habitat use and availability or energy expenditure outside of the natural range of variation. Overall, impacts on of Alternative A on birds, including ESA-listed species, and habitats, including designated critical habitat, would continue to be **adverse, minor,** and **insignificant.**		
Cultural and Historic Resources	Impacts to cultural and historic resources from installation, maintenance, and removal of tide gauges, buoys, and GPS reference stations under Alternative A would continue to be **adverse** and **negligible** to **minor.** Impacts to cultural and historic resources from bottom sampling under Alternative A would continue to be both **adverse** and **beneficial, permanent,** and **negligible** to **minor.** Beneficial impacts would occur if a resource were discovered that led to	Under Alternative B, impacts on cultural and historic resources would be the same or slightly, but not appreciably, larger than those that would occur under Alternative A for each impact causing factor. These impacts would not substantially increase in intensity with the increased survey effort of Alternative B. Overall, impacts of Alternative B to cultural and historic resources would be **adverse, moderate,** and **insignificant.**	Under Alternative C, impacts on cultural and historic resources would be the same or slightly, but not appreciably, larger than those that would occur under Alternatives A and B for each impact causing factor. These impacts would not substantially increase in intensity with the increased survey effort of Alternative C. Overall, impacts of Alternative C to cultural and historic resources would be **adverse, moderate,** and **insignificant.**

Resource	Alternative A: No Action – Conduct Surveys and Mapping for Coastal and Marine Data Collection with Current Technology and Methods, at Current Funding Levels	Alternative B: Conduct Surveys and Mapping with Equipment Upgrades, Improved Hydroacoustic Devices, and New Tide Stations	Alternative C: Upgrades and Improvements with Greater Funding Support
	the identification of a culturally-significant artifact or a previously undocumented historic site. Impacts to cultural and historic resources from anchoring under Alternative A would continue to be **adverse, permanent,** and **negligible** to **moderate.** Impacts on subsistence hunting and fishing, including Traditional Cultural Places, under Alternative A would continue to be **adverse** and **negligible** to **moderate.** Although the effects of impact causing factors on cultural and historic resources range from **negligible** to **moderate**, moderate impacts that could occur if the integrity of a resource is diminished would be very unlikely. Overall, impacts of Alternative A to cultural and historic resources would continue to be **adverse, moderate,** and **insignificant.**		

Resource	Alternative A: No Action – Conduct Surveys and Mapping for Coastal and Marine Data Collection with Current Technology and Methods, at Current Funding Levels	Alternative B: Conduct Surveys and Mapping with Equipment Upgrades, Improved Hydroacoustic Devices, and New Tide Stations	Alternative C: Upgrades and Improvements with Greater Funding Support
Socioeconomic Resources	The economic impacts of ocean data procured under Alternative A on health and safety, recreational economic activity, transportation, and energy-related activities would continue to be **indirect, beneficial,** and **moderate**. Impacts to commercial fishing under Alternative A would continue to be **adverse** and **negligible**. Data collected under Alternative A would continue to improve the quality and quantity of ocean data and data products. Overall, Alternative A would continue to have **indirect, beneficial**, and **moderate** impacts on the ocean economy.	The economic benefits of impacts of Alternative B would be the same or slightly, but not appreciably, larger than those discussed above under Alternative A. These impacts would not substantially increase in intensity with the increased survey effort of Alternative B. Overall, Alternative B would have **indirect, beneficial**, and **moderate** impacts on the ocean economy.	The economic benefits of impacts of Alternative C would be the same or slightly, but not appreciably, larger than those under Alternatives A and B. These impacts would not substantially increase in intensity with the increased survey effort of Alternative C. Overall, Alternative C would have **indirect, beneficial**, and **moderate** impacts on the ocean economy.
Environmental Justice	Impacts of underwater acoustic sources on subsistence hunting of marine mammals under Alternative A would continue to be **adverse** and **moderate**, and the impacts to subsistence fishing communities would continue to be **adverse** and **minor**.	Under Alternative B, impacts on environmental justice would be the same or slightly, but not appreciably, larger than those that would occur under Alternative A for each impact causing factor. These impacts would not substantially increase in intensity with the	Under Alternative C, impacts on environmental justice would be the same or slightly, but not appreciably, larger than those that would occur under Alternatives A and B for each impact causing factor. These impacts would not substantially increase in intensity

Resource	Alternative A: No Action – Conduct Surveys and Mapping for Coastal and Marine Data Collection with Current Technology and Methods, at Current Funding Levels	Alternative B: Conduct Surveys and Mapping with Equipment Upgrades, Improved Hydroacoustic Devices, and New Tide Stations	Alternative C: Upgrades and Improvements with Greater Funding Support
	Impacts of vessel and equipment noise on subsistence hunting of marine mammals under Alternative A would continue to be **adverse** and **minor**, and the impacts to subsistence fishing communities would continue to be **adverse** and **negligible**. Impacts of vessel and equipment presence and movement on subsistence hunting of marine mammals under Alternative A would continue to be **adverse** and **moderate**, and the impacts to subsistence fishing communities would continue to be **adverse** and **negligible**. Impacts of human activities and accidental leakage or spillage of oil, fuel, and chemicals on subsistence hunting and fishing under Alternative A would continue to be **adverse** and **minor**. Impacts of marine trash and debris and air emissions on subsistence hunting and fishing activities under	increased survey effort of Alternative B. Overall, impacts of Alternative B on environmental justice would continue to be **adverse, minor** to **moderate,** and **insignificant.**	with the increased survey effort of Alternative C. Overall, impacts of Alternative C on environmental justice would continue to be **adverse, minor** to **moderate,** and **insignificant.**

Resource	Alternative A: No Action – Conduct Surveys and Mapping for Coastal and Marine Data Collection with Current Technology and Methods, at Current Funding Levels	Alternative B: Conduct Surveys and Mapping with Equipment Upgrades, Improved Hydroacoustic Devices, and New Tide Stations	Alternative C: Upgrades and Improvements with Greater Funding Support
	Alternative A would continue to be **adverse** and **negligible**. The availability of new mapping and charting information under Alternative A would have **beneficial** effects on EJ communities. Overall, impacts of Alternative A on environmental justice would continue to be **adverse, minor** to **moderate,** and **insignificant.**		