

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	<p>Impacts to habitats from water column disruptions under Alternative A would continue to be adverse and negligible.</p> <p>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.</p> <p>The impact on habitats from invasive species dispersal facilitated by activities under Alternative A would likely continue to be adverse and minor.</p> <p>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.</p>	<p>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.</p> <p>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.</p> <p>Overall, impacts to habitats under Alternative B would be adverse, minor, and insignificant.</p>	<p>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.</p> <p>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.</p> <p>Overall, impacts to habitats under Alternative C would be adverse, minor, and insignificant.</p>

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	Overall, impacts to habitats under Alternative A would continue to be adverse, minor, and insignificant.		
Marine Mammals	<p>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.</p> <p>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.</p> <p>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.</p> <p>Impacts on marine mammals (cetaceans, pinnipeds, sirenians, and fissipeds) from active underwater acoustic sources, vessel and equipment sound, vessel presence and movement of equipment in the</p>	<p>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.</p> <p>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.</p> <p>Overall, impacts of Alternative B on marine mammals, including ESA-listed species, and habitat, including designated critical habitat, would be adverse, minor, and insignificant.</p>	<p>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.</p> <p>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.</p> <p>Overall, impacts of Alternative C on marine mammals, including ESA-listed species, and habitat, including designated critical habitat, would be adverse, minor, and insignificant.</p>

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	<p>water under Alternative A would continue to be adverse and minor.</p> <p>Impacts on pinnipeds and fissipeds from air emissions under Alternative A would continue to be adverse and negligible.</p> <p>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.</p> <p>Potential impacts from underwater acoustic sources include injury exposures in the form of hearing loss (PTS) on cetaceans, but such injury would be rare and confined to a few individual high-frequency cetaceans. It would also include behavioral</p>		

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	<p>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.</p> <p>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.</p> <p>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.</p>		
Sea Turtles	<p>Impacts to sea turtles and their habitats from active underwater acoustic sources, vessel and equipment sound, and onshore activities under Alternative A would continue to be adverse and negligible.</p>	<p>Impacts of Alternative B on sea turtles 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.</p>	<p>Impacts of Alternative C on sea turtles 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.</p>

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	<p>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.</p> <p>Impacts to sea turtles and their habitats from accidental oil, fuel, or chemical spills would continue to be adverse and negligible to minor.</p> <p>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.</p> <p>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</p>	<p>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.</p> <p>Overall, impacts on sea turtles and their habitat, including designated critical habitat, would be adverse, minor, and insignificant.</p>	<p>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.</p> <p>Overall, impacts on sea turtles and their habitat, including designated critical habitat, would be adverse, minor, and insignificant.</p>

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	<p>Overall, impacts under Alternative A on sea turtles and their habitats, including designated critical habitat, would continue to be adverse, minor, and insignificant.</p>		
Fish	<p>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.</p> <p>Impacts to fish and their habitats from active underwater acoustic sources and air emissions under Alternative A would continue to be adverse and minor.</p> <p>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</p>	<p>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.</p> <p>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 increased survey effort of Alternative B.</p>	<p>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.</p> <p>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 with the increased survey effort of Alternative C.</p>

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	<p>habitat availability and use or in fish behavior.</p> <p>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.</p>	<p>Overall, impacts of Alternative B on fish, including ESA-listed species, and fish habitat, including designated critical habitat, would be adverse, minor, and insignificant.</p>	<p>Overall, impacts of Alternative C on fish, including ESA-listed species, and fish habitat, including designated critical habitat, would be adverse, minor, and insignificant.</p>
Aquatic Macroinvertebrates	<p>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.</p> <p>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.</p> <p>Overall, impacts of Alternative A on aquatic macroinvertebrates, including ESA-listed species, and habitats, including designated critical habitat,</p>	<p>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.</p> <p>Overall, impacts of Alternative B on aquatic macroinvertebrates, including ESA-listed species, and habitats, including designated critical habitat, would be adverse, minor, and insignificant.</p>	<p>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.</p> <p>Overall, impacts of Alternative C on aquatic macroinvertebrates, including ESA-listed species, and habitats, including designated critical habitat, would be adverse, minor, and insignificant.</p>

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	would continue to be adverse, minor, and insignificant.		
Essential Fish Habitat (EFH)	<p>Impacts to EFH from disturbance of the water column under Alternative A would continue to be adverse and negligible.</p> <p>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.</p> <p>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).</p> <p>Overall, impacts of Alternative A on EFH would continue to be adverse, minor, and insignificant.</p>	<p>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.</p> <p>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.</p> <p>Overall, impacts of Alternative B on EFH would be adverse, minor, and insignificant.</p>	<p>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.</p> <p>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.</p> <p>Overall, impacts of Alternative C on EFH would be adverse, minor, and insignificant.</p>

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<p>Seabirds, Shorebirds and Coastal Birds, and Waterfowl</p>	<p>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.</p> <p>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.</p> <p>Impacts to birds and their habitats from accidental oil, fuel, or chemical spills would continue to be adverse and minor to moderate.</p> <p>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.</p>	<p>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.</p> <p>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.</p> <p>Overall, impacts on of Alternative B on birds, including ESA-listed species, and habitats, including designated critical habitat, would be adverse, minor, and insignificant.</p>	<p>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.</p> <p>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.</p> <p>Overall, impacts on of Alternative C on birds, including ESA-listed species, and habitats, including designated critical habitat, would be adverse, minor, and insignificant.</p>

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	<p>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.</p> <p>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.</p>		
<p>Cultural and Historic Resources</p>	<p>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.</p> <p>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</p>	<p>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.</p> <p>Overall, impacts of Alternative B to cultural and historic resources would be adverse, moderate, and insignificant.</p>	<p>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.</p> <p>Overall, impacts of Alternative C to cultural and historic resources would be adverse, moderate, and insignificant.</p>

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	<p>the identification of a culturally-significant artifact or a previously undocumented historic site.</p> <p>Impacts to cultural and historic resources from anchoring under Alternative A would continue to be adverse, permanent, and negligible to moderate.</p> <p>Impacts on subsistence hunting and fishing, including Traditional Cultural Places, under Alternative A would continue to be adverse and negligible to moderate.</p> <p>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.</p> <p>Overall, impacts of Alternative A to cultural and historic resources would continue to be adverse, moderate, and insignificant.</p>		

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<p>Socioeconomic Resources</p>	<p>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.</p> <p>Impacts to commercial fishing under Alternative A would continue to be adverse and negligible.</p> <p>Data collected under Alternative A would continue to improve the quality and quantity of ocean data and data products.</p> <p>Overall, Alternative A would continue to have indirect, beneficial, and moderate impacts on the ocean economy.</p>	<p>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.</p> <p>Overall, Alternative B would have indirect, beneficial, and moderate impacts on the ocean economy.</p>	<p>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.</p> <p>Overall, Alternative C would have indirect, beneficial, and moderate impacts on the ocean economy.</p>
<p>Environmental Justice</p>	<p>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.</p>	<p>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</p>	<p>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</p>

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	<p>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.</p> <p>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.</p> <p>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.</p> <p>Impacts of marine trash and debris and air emissions on subsistence hunting and fishing activities under</p>	<p>increased survey effort of Alternative B.</p> <p>Overall, impacts of Alternative B on environmental justice would continue to be adverse, minor to moderate, and insignificant.</p>	<p>with the increased survey effort of Alternative C.</p> <p>Overall, impacts of Alternative C on environmental justice would continue to be adverse, minor to moderate, and insignificant.</p>

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	<p>Alternative A would continue to be adverse and negligible.</p> <p>The availability of new mapping and charting information under Alternative A would have beneficial effects on EJ communities.</p> <p>Overall, impacts of Alternative A on environmental justice would continue to be adverse, minor to moderate, and insignificant.</p>		