



Table: U.S. ARCTIC RESEARCH PLAN Intersection with BOEM Environmental Studies

This table is organized to display recent BOEM-directed research as it supports the national *Arctic Research Plan* FY2013-2017, issued by the Executive Office of the President, National Science and Technology Council, February 2013. The *Arctic Research Plan* was produced by the Interagency Arctic Research Policy Committee (IARPC) in recognition of responsibilities described in the Arctic Research Policy Act of 1984. IARPC activities are chaired by the National Science Foundation and serve to coordinate science and technology policy across diverse Federal institutions. Chapter 3 of the *Arctic Research Plan* (ARP) discusses each numbered item identified in the table below, and can be accessed from the White House web portal [here](#). The *Arctic Research Plan* directly supports the *Implementation Plan for the National Strategy for the Arctic Region*, issued in January 2014.

Current BOEM Annual Study Plans and four decades of completed reports are available at <http://www.boem.gov/akstudies>. Some BOEM studies listed in the table are relevant under more than one category. Table was last updated on August 8, 2014. Contact: Dr. Dee Williams, Studies Chief, Alaska OCS Region, dee.williams@boem.gov

ARP Item	Research Topic	BOEM Partner	BOEM Funding	Study Duration	Key Words
3.1	Understand Sea-ice Processes, Ecosystem Processes, Ecosystem Services, and Climate Feedbacks In The Beaufort and Chukchi Seas And The Contiguous Arctic Ocean				
3.1.1	Develop a framework of observations and modeling to support forecasting of sea-ice extent on seasonal to annual scales for operational and research needs				
	Characterization of the Circulation on the continental Shelf Areas of the Northeast Chukchi and Western Beaufort Seas	UAF	\$5,056,252	2012 - 2016	high frequency radar, ocean currents, gliders, drifters, Barrow Canyon
	Ecosystem Observations in the Chukchi Sea: Biophysical Mooring and Climate Modeling	NOAA	\$2,068,928	2010 - 2015	ice coverage, forecast
	Enhanced Verification and Interpretation of Freeze-up Conditions for the Northeast Chukchi Shelf: Field Observations and Process Studies; Freeze-up Forecasts	UAF	\$1,995,000	2014 - 2019	sea ice forecasting, sea ice hind cast, freeze-up, Burger drill site
	Application of High Frequency Radar to Potential Hydrocarbon Development Areas in the Northeast Chukchi Sea	UAF	\$1,056,322	2009-2014	surface currents, Barrow Canyon, circulation
	Mapping and Characterization of Recurring Polynyas and Landfast Ice in the Chukchi Sea	UAF	\$461,404	2009 - 2012	ice leads, landfast ice, breakouts
	Satellite-Tracked Drifter Measurements in the Northeast Chukchi Sea	UAF	\$459,892	2011- 2015	ocean currents, current velocities
	Development and Testing of a Low-Cost Satellite Tracked Ice Drifter for Arctic Alaska	UAF-CMI	\$433,409	2014 - 2017	ice velocities, model validation
	Development of an accurate model of the Beaufort and Chukchi Ice Drift and Dispersion for Forecasting Spill Trajectories and Providing Decision Support for Spill Response	UAF-CMI	\$359,078	2013 -2016	spill response, ice velocities, ice deformation, convergence zone
	Adaptation of Arctic Circulation Model	Rutgers	\$349,999	2010 - 2012	ocean currents, ice coverage, hind cast

ARP Item	Research Topic	BOEM Partner	BOEM Funding	Study Duration	Key Words
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3.1.2 Identify study sites in the Beaufort and Chukchi Seas and the contiguous Arctic Ocean where climate feedbacks are active

	Bowhead Whale feeding Variability in the Western Alaskan Beaufort Sea: Oceanography and Feeding (BOWFEST)	NOAA/ Others	\$8,095,000	2006 - 2013	feeding, variability, behavior, Cross Island, Barrow , aircraft, tagging
	Hanna Shoal Ecosystem Study	UT-A	\$5,665,144	2011 - 2016	food web, ocean currents, species distribution, diversity
	Characterization of the Circulation on the Continental Shelf Areas of the Northeast Chukchi and Western Beaufort Seas	UAF	\$5,056,252	2012 - 2016	high frequency radar, ocean currents, gliders, drifters, Barrow Canyon
	Arctic Whale Ecology Study: Use of the Chukchi Sea by Endangered Baleen and other Whales (ARCWEST)	NOAA	\$4,502,000	2012 - 2017	Smith Bay, Barrow Canyon, whale distribution, habitat, Barrow arch, nutrients
	Chukchi Acoustic, Oceanography and Zooplankton Study: Hanna Shoal (Extension of CHAOZ)	NOAA	\$3,933,671	2014 - 2017	passive acoustic, zooplankton detection, TAPS-6
	ANIMIDA III: Contaminants, Sources, and Bioaccumulation	Olgoonik/ Fairweather	\$2,700,000	2013 - 2017	monitoring, sediment, bivalves, amphipods, hydrocarbons
	Ecosystem Observations in the Chukchi Sea: Biophysical Mooring and Climate Modeling	NOAA	\$2,068,928	2010 - 2015	ice coverage, forecast
	Application of High Frequency Radar to Potential Hydrocarbon Development Areas in the Northeast Chukchi Sea	UAF	\$1,056,322	2009-2014	surface currents, Barrow Canyon, ocean currents
	Biogeochemical Assessment of the OCS Arctic Waters: Current Status and Vulnerability to Climate Change	UAF-CMI	\$756,704	2008 - 2014	north Aleutian Basin, hydrographic, climate, net ecosystem production
	Toward a Predictive Model of Arctic Coastal Retreat in a Warming Climate, Beaufort Sea, Alaska	NOPP	\$577,586	2006-2010	coastal erosion, bluff retreat, wave modeling, thermal modeling
	Mapping and Characterization of Recurring Polynyas and Landfast Ice in the Chukchi Sea	UAF	\$461,404	2009 - 2012	ice leads, landfast ice, breakouts
	Wading Shorebirds Habitats, Food Resources, Associated Infauna, Sediment Characteristics and Bioremediation Potential of Resident Microbiota of Deltaic Mudflats	UAF	\$365,236	2011 - 2015	population structure, chemical footprint, Jago River, Okpilak River, Canning River
	ANIMIDA III: Arctic Kelp Communities in the Beaufort Sea: Sentinels of Long-Term Change	UT-A	\$128,774	2014 - 2017	cANIMIDA, Camden Bay, chemical footprint, biota, sediments
	Sea Level Measurements along the Alaskan Chukchi and Beaufort Coasts	UAF-CMI	\$72,178	2014 - 2017	ocean currents, storm surges

3.1.3 Complete deployment of a Distributed Biological Observatory in the Arctic Ocean to create long-term data sets on biological, physical, and chemical variability, change, and ecosystem response

	Hanna Shoal Ecosystem Study	UT-A	\$5,665,144	2011 - 2016	food web, ocean currents, species distribution, diversity
	Passive Acoustic Detection and Monitoring of Endangered Whales in the Arctic (CHAOZ)	NOAA	\$4,304,300	2010 - 2015	tracking, cetaceans, climate modeling, hydrophone array, biophysical moorings
	Chukchi Acoustic, Oceanography and Zooplankton Study: Hanna Shoal (Extension of CHAOZ)	NOAA	\$3,933,671	2014 - 2017	passive acoustic, zooplankton detection, TAPS-6
	Chukchi Sea Offshore Monitoring in Drilling Area: Chemistry and Benthos	UT-A	\$2,887,495	2008 - 2012	benthic biota, food web, sediment, contaminants
	ANIMIDA III: Contaminants, Sources, and Bioaccumulation	Olgoonik/ Fairweather	\$2,700,000	2013 - 2017	monitoring, sediment, bivalves, amphipods, hydrocarbons
	Arctic Marine Biodiversity Observing Network for Ecosystem Monitoring (Chukchi Sea)	Industry/ NOAA	\$1,500,000	2014 - 2019	microbes, plankton, meiofauna, epibenthic, fishes, birds, mammals, food web

ARP Item	Research Topic	BOEM Partner	BOEM Funding	Study Duration	Key Words
3.1.4	Develop integrated ecosystem research in the Beaufort and Chukchi Seas				
	Distribution and Relative Abundance of Marine Mammals in the Chukchi Sea and the Fall Migration of Bowhead Whales in the Beaufort Sea	NOAA	\$14,586,585	2011 - 2016	pinnipeds, cetaceans, migration, satellite-track, tags, aerial, abundance
	Hanna Shoal Ecosystem Study	UT-A	\$5,665,144	2011 - 2016	food web, ocean currents, species distribution, diversity
	Passive Acoustic Detection and Monitoring of Endangered Whales in the Arctic (CHAOZ)	NOAA	\$4,304,300	2010 - 2015	tracking, cetaceans, climate modeling, hydrophone array, biophysical moorings
	Chukchi Acoustic, Oceanography and Zooplankton Study: Hanna Shoal (Extension of CHAOZ)	NOAA	\$3,933,671	2014 - 2017	passive acoustic, zooplankton detection, TAPS-6
	Chukchi Sea Offshore Monitoring in Drilling Area: Chemistry and Benthos	UT-A	\$2,887,495	2008 - 2012	benthic biota, food web, sediment chemistry, contaminants
	ANIMIDA III: Contaminants, Sources, and Bioaccumulation	Olgoonik/ Fairweather	\$2,700,000	2013 - 2017	monitoring, sediment, bivalves, amphipods, hydrocarbons
	ANIMIDA III: Arctic Kelp Communities in the Beaufort Sea: Sentinels of Long-Term Change	UT-A	\$623,661	2012 - 2017	boulder patch, Liberty Prospect, ambient light, Camden Bay
	Distribution of Fish, Crab and Lower Trophic Communities in the Chukchi Sea Lease Area (Arctic Ecosystem Integrated Survey)	UAF/NOAA	\$2,600,000	2012 - 2016	ecology, demersal, pelagic, invertebrate, food-web
	Trophic Links: Forage Fish, their Prey, and Ice Seals in the Northeast Chukchi Sea	UAF-CMI	\$532,173	2009 - 2013	food web, isotope, fish, seal, benthic, demersal, pelagic, arctic cod
	Genomics of Arctic Cod: A Sentinel Species in a Changing Environment	USGS	\$300,000	2014 - 2017	genetics, genomics, transcriptomics, arctic cod, boreogadus saida
	Distribution and Habitat Use of Fish in the Nearshore Ecosystem of the Beaufort and Chukchi Sea	NOAA	\$184,000	2012 - 2016	nearshore habitat diversity, diet, temperature, salinity, Peard Bay, baseline
	Epifaunal Communities in the Central Beaufort Sea	UAF-CMI	\$123,310	2008 - 2012	epibenthic, abundance, species, biomass, trawl, voucher specimens
	Population Connectivity and Larval dispersal in Bering, Chukchi and Beaufort Sea Snow Crab Populations: Estimating Spatial Scales of Disturbance Impacts	UAF-CMI	\$19,787	2009 -2011	population structure, genetic variation, microsatellite, mitochondrial, phylogenetic
3.2	Understand Terrestrial Ice Processes, Ecosystem Processes, Ecosystem Services, And Climate Feedbacks In The Arctic				
3.2.1	Perform glacial-process studies targeting specific dynamic regimes				
	Toward a Predictive Model of Arctic Coastal Retreat in a Warming Climate, Beaufort Sea, Alaska	NOPP	\$576,586	2006-2010	coastal erosion, bluff retreat, wave modeling, thermal modeling
	Mapping Sea Ice Overflood Using Remote Sensing from Smith Bay to Camden Bay	D.F. Dickins	\$478,017	2006 - 2009	strudel scour, strudel holes, North Slope
	Evaluating Chukchi Sea Trace Metals and Hydrocarbons Sourced from Nearby Coastal Rivers	UAF-CMI	\$232,760	2012 - 2014	polycyclic aromatic hydrocarbons, bedload samples
3.2.2	Coordinate and integrate terrestrial ecosystem research efforts				
	Marine Mammal/Physical Oceanography Synthesis (SOAR - Synthesis of Arctic Research)	NOAA	\$1,798,459	2011 - 2016	riverine, traditional knowledge, oceanography, marine mammals
	Demography and Behavior of Polar Bears Summering on Shore in Alaska	USGS	\$1,480,767	2009 - 2014	coastline, habitat, Barter Island, Cross Island, demographic, behavior

ARP Item	Research Topic	BOEM Partner	BOEM Funding	Study Duration	Key Words
	ShoreZone Mapping of the North Slope of Alaska	Nuka	\$554,121	2011 - 2015	imagery, groundtruthing, geomorphic, nearshore habitat, mapping
	Wading Shorebirds Habitats, Food Resources, Associated Infauna, Sediment Characteristics and Bioremediation	UAF	\$365,236	2011 - 2016	macrofauna assemblage, littoral zone, interstitial, invertebrates, shorebirds
	Shorebirds and Infaunal Abundance and Distribution on Delta Mudflats along the Beaufort Sea	USGS	\$237,169	2011 - 2015	invertebrate, foraging, shorebirds, sediment, chemical footprint
	Synthesis of Time-Interval Changes in Trace Metals and Hydrocarbons in Near shore Sediments of the Alaskan Beaufort Sea: A Statistical Analysis	UAF-CMI	\$82,184	2006 - 2007	hydrocarbons, contaminants, sediments, nearshore, mercury
	Biodegradation and Transport of Crude Oil in Sand and Gravel Beaches of Arctic Alaska	UAF-CMI	\$56,310	2013 - 2017	viscosity, sediments, soil profile, wave action, porosity, density
3.2.3	Identify and study key sites where climate feedbacks are active, including permafrost, snow, hydrates, and glaciers				
	Not Jurisdiction of BOEM				
3.2.4	Investigate the frequency and severity of wildland fires in the Arctic				
	Not Jurisdiction of BOEM				
3.2.5	Conduct socio-economic research to understand ecosystem services as increased warming changes the Arctic tundra				
	COMIDA: Impact Monitoring for Offshore Subsistence Hunting	Stephen Braund	\$999,805	2009 - 2013	marine mammal, fish, harvest, climate, sea ice
	The Study of Sharing Networks to Assess the Vulnerabilities of Local Communities to Oil and Gas Development Impacts in Arctic Alaska	UAF	\$785,000	2007 - 2013	subsistence, Wainwright, Kaktovik, Venetie, Iñupiat
	Social Indicators in Coastal Alaska: Arctic Communities	Stephen Braund	\$669,656	2011 - 2012	cultural, health, climate, subsistence
	MAG-PLAN Modification: New Data Collection, Testing and Streamlining of OCS Economic Impact Model for Alaska	Northern Economics	\$588,857	2011 - 2012	modeling review board, economic impact model, cost function
	Subsistence Mapping of Nuiqsut, Kaktovik and Barrow : Past and Present Comparison	Stephen Braund	\$399,994	2004 - 2007	Iñupiat, harvest, traditional knowledge
	Continuation of Impact Assessment for Cross Island Whaling Activities - Beaufort Sea	ASCR	\$328,507	2008 - 2013	Iñupiat, Nuiqsut, bowhead whale, subsistence, migration, hunting
	Subsistence Use and Knowledge of Salmon in Barrow and Nuiqsut	UAF-CMI	\$119,459	2009-2013	Inupiat, fishing, traditional knowledge
3.3	Understand Atmospheric Surface Heat, Energy, And Mass Balances				
3.3.1	Improve understanding of short-lived climate forcers (SLCFs); source regions, direct and indirect effects, and net impact on Arctic warming				
	Ecosystem Observations in the Chukchi Sea: Biophysical Mooring and Climate Modeling	NOAA	\$2,068,928	2010 - 2015	ice coverage, forecast
	Beaufort and Chukchi Seas Mesoscale Meteorology Model	UAF	\$1,784,735	2006 - 2012	forecasting model, winds, meteorological stations, buoys
	Arctic Air Quality Impact Assessment Modeling	ERG	\$1,751,036	2013 - 2016	pollutants, air quality
	Biogeochemical Assessment of the OCS Arctic Waters: Current Status and Vulnerability to Climate Change	UAF-CMI	\$756,704	2008 - 2014	Bering Sea, hydrographic, climate, net ecosystem production
	Adaptation of Arctic Circulation Model	Rutgers	\$349,999	2010 - 2012	ocean currents, coupled air-sea-ice, 30-year hindcast
	Sea Level Measurements along the Alaskan Chukchi and Beaufort Coasts	UAF-CMI	\$72,178	2014 - 2017	ocean currents, storm surges

ARP Item	Research Topic	BOEM Partner	BOEM Funding	Study Duration	Key Words
3.3.2	Improve understanding of processes that control the formation, longevity, and physical properties of Arctic clouds, including the effects of—and sensitivities to—aerosols				
	Beaufort and Chukchi Seas Mesoscale Meteorology Modeling	UAF	\$1,784,735	2006 - 2012	forecasting, model, winds, meteorological stations, buoys
	Arctic Air Quality Impact Assessment Modeling	ERG	\$1,751,036	2013 - 2016	pollutants, air quality
3.3.3	Develop an integrated understanding of Arctic atmospheric processes, their impact on the surface energy budget, and their linkages with oceanic, terrestrial, and cryospheric systems				
	Circulation, Cross-Shelf Exchange, Sea Ice, and Marine Mammal Habitats on the Alaskan Beaufort Sea Shelf	NOPP	\$2,948,000	2007-2009	Changing ice conditions, satellite observations, wind-forcing
	Enhanced Verification and Interpretation of Freeze-up Conditions for the Northeast Chukchi Shelf: Field Observations and Process Studies; Freeze-up Forecasts	UAF	\$1,995,000	2014 - 2019	sea ice, forecasting, hind cast, freeze-up, Burger
	Arctic Air Quality Impact Assessment Modeling	ERG	\$1,751,036	2013 - 2016	pollutants, air quality
	Biogeochemical Assessment of the OCS Arctic Waters: Current Status and Vulnerability to Climate Change	UAF-CMI	\$756,704	2008 - 2012	Bering Sea, hydrographic, climate, net ecosystem production
	Adaptation of Arctic Circulation Model	Rutgers	\$349,999	2010 - 2012	ocean currents, coupled air-sea-ice, 30-year hindcast
	Sea Level Measurements along the Alaskan Chukchi and Beaufort Coasts	UAF	\$72,178	2014 - 2017	ocean currents, storm surges
3.4	Integrate And Continue To Deploy A National Arctic Observing System And Promote International Cooperation To Create A Circumpolar Arctic Observing System				
3.4.1	Facilitate observing-system design for the arctic				
	Distribution and Relative Abundance of Marine Mammals in the Chukchi Sea and the Fall Migration of Bowhead Whales in the Beaufort Sea	NOAA	\$14,586,585	2011 - 2016	pinnipeds, cetaceans, migration, satellite-track, tags, aerial, abundance
	Bowhead Whale feeding Variability in the Western Alaskan Beaufort Sea: Oceanography and Feeding (BOWFEST)	NOAA/ Others	\$8,095,000	2006 - 2013	feeding, variability, behavior, Cross Island, Barrow , aircraft, tagging
	U.S.-Canada Transboundary Fish and Lower Trophic Communities	UAF	\$5,191,125	2012 - 2016	food web, DBO, arctic cod, Canada
	Characterization of the Circulation on the Continental Shelf Areas of the Northeast Chukchi and Western Beaufort Seas	UAF	\$5,056,252	2012 - 2016	high frequency radar, ocean currents, gliders, drifters, Barrow Canyon
	Arctic Whale Ecology Study: Use of the Chukchi Sea by Endangered Baleen and other Whales (ARCWEST)	NOAA	\$4,502,000	2012 - 2017	Smith Bay, Barrow Canyon, distribution, habitat, Barrow Arch, nutrients
	COMIDA: Factors Affecting the Distribution and Relative Abundance of Endangered Whales: Passive Acoustic Detection and Monitoring of Endangered Whales in the Arctic	NOAA	\$4,304,300	2010 - 2015	marine mammals, zooplankton, TAPS-6
	Chukchi Acoustic, Oceanography and Zooplankton Study: Hanna Shoal (Extension of CHAOZ)	NOAA	\$3,933,671	2014 - 2017	passive acoustic, zooplankton detection, TAPS-6
	ANIMIDA III: Contaminants, Sources, and Bioaccumulation	Olgoonik/ Fairweather	\$2,700,000	2013 - 2017	monitoring, sediment, bivalves, amphipods, hydrocarbons
	Distribution of Fish, Crab and Lower Trophic Communities in the Chukchi Sea Lease Area (Arctic Ecosystem Integrated Survey)	UAF/NOAA	\$2,600,000	2012 - 2016	ecology, demersal, pelagic, invertebrate, food-web
	Beaufort Sea Marine Fish Monitoring: Pilot Survey in the Central Beaufort Sea	UAF	\$1,764,252	2010 - 2015	food web, isotope, Barrow Canyon, arctic cod, benthic, pelagic, demersal
	Ice Seal Movements and Foraging: Village-based Satellite Tracking of Ringed and Bearded Seals	ADFG	\$1,174,994	2013 - 2017	pinnipeds, tagging, Kotzebue, habitat, ice seal committee, bathymetry, ice edge

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	Application of High-Frequency Radar to Potential Hydrocarbon Development Areas in the Northeast Chukchi Sea	UAF	\$1,056,322	2009 - 2014	surface currents, Barrow Canyon, Barrow , Wainwright, Point Lay, upwelling
	COMIDA: Impact Monitoring for Offshore Subsistence Hunting	Stephen Braund	\$999,805	2009 - 2013	Iñupiat, Point Lay, Wainwright, gps, sea ice, traditional knowledge
	Study of Sharing Networks to Assess the Vulnerabilities of Local Communities to O&G Development Impacts in Arctic Alaska	UAF	\$785,000	2007 - 2013	subsistence, Wainwright, Kaktovik, Venetie, Iñupiat
	Abundance Estimates of Ice Associated Seals: Bering Sea Populations that Inhabit the Chukchi Sea during Open-Water Period	NOAA	\$713,010	2012 - 2014	Russia, logistics support
3.4.2	Assess local-resident priorities for addressing change				
	Quantitative Description of Potential Impacts of OCS Activities on Bowhead Whale Hunting and Subsistence in the Beaufort Sea	EDAW	\$702,445	2001 - 2006	Iñupiat, Barrow , Kaktovik, Nuiqsut, Savoonga, household survey
	Social Indicators in Coastal Alaska: Arctic Communities	Stephen Braund	\$669,659	2011 - 2012	household survey, traditional knowledge, health, subsistence
	Trophic Links: Forage Fish, Their Prey, and Ice Seals in the northeast Chukchi Sea	UAF-CMI	\$532,173	2009 - 2014	food web, isotope, fish, seal, benthic, demersal, pelagic, arctic cod
	Subsistence Mapping of Nuiqsut, Kaktovik and Barrow : Past and Present Comparison	Stephen Braund	\$399,994	2004 - 2007	Iñupiat, harvest, traditional knowledge
	Aggregate Effects Research & Environmental Mitigation Monitoring of Oil Operations in the Vicinity of Nuiqsut	Stephen Braund	\$373,298	2009 - 2013	Iñupiat, Nuiqsut, oil, gas, subsistence, harvest, mitigation
	Continuation of Impact Assessment for Cross Island Whaling Activities - Beaufort Sea	ASCR	\$328,507	2008 - 2013	Iñupiat, Nuiqsut, bowhead, subsistence, gps, harvest, hunt
	Researching Technical Dialogue with Alaskan Coastal Communities: Analysis of the Social, Cultural, Linguistic, and Institutional Parameters of Public/Agency Communication Patterns	EDAW	\$299,878	2004 - 2009	NEPA analysis, linguistics, Iñupiat, development, focus groups
	Dispersal Patterns and Summer Ocean Distribution of Adult Dolly Varden from the Wulik River, Alaska, using Satellite Tags.	UAF-CMI	\$146,510	2012 - 2013	fish, distribution, migration, subsistence,
	Subsistence Use and Knowledge of Beaufort Salmon Populations	UAF-CMI	\$119,459	2009 - 2012	Iñupiat, traditional knowledge, Barrow, Nuiqsut, whitefish
3.4.3	Combine in-situ and remotely sensed observations of sea ice with local community and traditional knowledge				
	Crude Oil Infiltration and Movement in First-year Sea Ice: Impacts on Ice-associated Biota and Physical Constraints	UAF-CMI	\$298,214	2014 - 2017	oil spill, temperature, salinity, brine channel network, sea ice
	Distribution and Abundance of Select Trace Metals in Chukchi and Beaufort Sea Ice	UAF-CMI	\$262,073	2013 - 2016	trace metals, sea ice, laboratory, seawater, Camden Bay
	Traditional Knowledge Implementation: Accessing Arctic Community Panels of Subject Matter Experts	Pending			
3.4.4	Conduct long-term monitoring of key outlet glaciers and tidewater glaciers				
	Not Jurisdiction of BOEM				
3.4.5	Monitor the biological and physical state of the Arctic marine environment				
	Distribution and Relative Abundance of Marine Mammals in the Chukchi Sea and the Fall Migration of Bowhead Whales in the Beaufort Sea	NOAA	\$14,586,585	2011 - 2016	pinnipeds, cetaceans, migration, satellite-track, tags, aerial, abundance
	Hanna Shoal Ecosystem Study	UT-A	\$5,665,144	2011 - 2016	oceanography, benthic biota, food web, sediment chemistry, contaminants
	COMIDA: Factors Affecting the Distribution and Relative Abundance of Endangered Whales: Passive Acoustic Detection and Monitoring of Endangered Whales in the Arctic	NOAA	\$4,304,300	2010 - 2015	marine mammals, zooplankton, biophysical conditions
	Chukchi Acoustic, Oceanography and Zooplankton Study: Hanna Shoal (Extension of CHAOZ)	NOAA	\$3,933,671	2014 - 2017	passive acoustic, zooplankton detection, TAPS-6
	Chukchi Sea Offshore Monitoring in Drilling Area: Chemistry and Benthos	UT-A	\$2,887,495	2008 - 2012	benthic biota, food web, sediment, contaminants

ARP Item	Research Topic	BOEM Partner	BOEM Funding	Study Duration	Key Words
	ANIMIDA III: Contaminants, Sources, and Bioaccumulation	Olgoonik	\$2,700,000	2013 - 2017	monitoring, sediment, bivalves, amphipods, hydrocarbons
	Satellite Tracking of Bowhead Whales: Habitat Use, Passive Acoustic and Environmental Monitoring	ADFG	\$2,699,857	2012 - 2015	tagging, Saint Lawrence, Point Hope, Canada, sensors, monitoring, ambient
	Distribution of Fish, Crab and Lower Trophic Communities in the Chukchi Sea Lease Area (Arctic Ecosystem Integrated Survey)	UAF/NOAA	\$2,600,000	2012 - 2016	ecology, demersal, pelagic, invertebrate, food-web
	Beaufort Sea Marine Fish Monitoring: Pilot Survey in the Central Beaufort Sea	UAF	\$1,764,252	2010 - 2014	food web, isotope, Barrow Canyon, arctic cod, benthic, pelagic, demersal
	Ice Seal Movements and Foraging: Village based Satellite Tracking and Acoustic Monitoring of Ringed, Bearded, and Spotted Seals	ADFG	\$1,174,994	2013 - 2017	satellite, telemetry, habitat, mapping
	COMIDA: Impact Monitoring for Offshore Subsistence Hunting	Stephen Braund	\$999,805	2009 - 2013	Chukchi Sea, Iñupiat, harvest, Point Lay, Wainwright, boat tracks, traditional knowledge
	Biogeochemical Assessment of the OCS Arctic Waters: Current Status and Vulnerability to Climate Change	UAF-CMI	\$756,704	2008 - 2014	Bering Sea, hydrographic, climate, net ecosystem production
	ANIMIDA III: Arctic Kelp Communities in the Beaufort Sea: Sentinels of Long-Term Change	UT-A	\$623,661	2012 - 2017	boulder patch, Liberty Prospect, ambient light, Camden Bay
	Trophic Links: Forage Fish, Their Prey, and Ice Seals in the northeast Chukchi Sea	UAF-CMI	\$532,173	2009 - 2014	food web, isotope, diet, fish, seal, benthic, demersal, pelagic, arctic cod,
	Genomics of Arctic Cod: A Sentinel Species in a Changing Environment	USGS	\$300,000	2014 - 2017	genetics, genomics, transcriptomics, arctic cod, Boreogadus saida
3.4.6	Assess the effects of clouds and atmospheric constituents on surface radiation balance				
	Not Jurisdiction of BOEM				
3.4.7	Assess the impact of terrestrial warming and permafrost thawing on the carbon cycle				
	Not Jurisdiction of BOEM				
3.4.8	Improve data access				
	Distribution of Fish, Crab and Lower Trophic Communities in the Chukchi Sea Lease Area (Arctic Ecosystem Integrated Survey)	UAF/NOAA	\$2,600,000	2012 - 2016	ecology, demersal, pelagic, invertebrate, food-web
	Marine Mammal/Physical Oceanography Synthesis (SOAR - Synthesis of Arctic Research)	NOAA	\$1,798,459	2011 - 2016	traditional knowledge, oceanography, marine mammals
	Enhancement of the Environmental Studies Program Information System and the Multipurpose Marine Cadastre to Provide Environmental Studies Program Data	NOAA	\$1,700,000	2012 - 2015	geoespis, database, noaa-csc, geospatial web portal
	Synthesis of Information on the Socioeconomic Effects of Oil and Gas Activities in Alaska	Stephen Braund	\$349,249	2001 - 2006	sociocultural, subsistence, economy, Exxon Valdez
	Developing BOEM's Access to Protected Species Occurrence Data for Impact Analysis and Rulemaking	USGS, NOAA, Duke	\$180,000	2014-2016	bowhead whale, distribution, density, OBIS
	Alaska Marine Science Symposium (co-sponsor)	NPRB	\$100,000	2010 - 2014	workshop, environmental studies program
	Joint Funding Opportunities in Existing Marine Fish Studies: Beaufort Sea Fish and their Trophic Linkages--Literature Search and Synthesis	UAF	\$23,578	2012 - 2012	fish, prey, food web
	Arctic Research Synthesis Conference	BGES	Pending	2014 - 2015	workshop, information transfer

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3.4.9	Engage indigenous observers and communities in monitoring environmental parameters				
	Social Indicators in Coastal Alaska: Arctic Communities	Stephen Braund	\$669,659	2011 - 2014	marine mammal, fish, subsistence, harvest,
	ShoreZone Mapping of the North Slope of Alaska	Nuka	\$554,121	2011 - 2015	imagery, groundtruthing, geomorphic, nearshore habitat, mapping
	Subsistence Mapping of Nuiqsut, Kaktovik and Barrow : Past and Present Comparison	Stephen Braund	\$399,994	2004 - 2007	Iñupiat, harvest, traditional knowledge
	Aggregate Effects Research & Environmental Mitigation Monitoring of Oil Operations in the Vicinity of Nuiqsut	Stephen Braund	\$393,490	2009 - 2013	Iñupiat, oil, gas, subsistence, harvest, mitigation
	Analysis of Variation in Abundance of Arctic Cisco in the Colville River	ABR	\$345,520	2004 - 2007	traditional knowledge, Iñupiat, Nuiqsut, fish
	Sea Level Measurements along the Alaskan Chukchi and Beaufort Coasts	UAF-CMI	\$72,178	2014 - 2017	ocean currents, storm surges
	Traditional Knowledge Implementation: Accessing Arctic Community Panels of Subject Matter Experts	Pending			
3.5	Integrate Arctic Regional Models				
3.5.1	Inventory Arctic modeling activities				
	Enhanced Verification and Interpretation of Freeze-up Conditions for the Northeast Chukchi Shelf: Field Observations and Process Studies; Freeze-up Forecasts	UAF	\$1,995,000	2014 - 2019	sea ice forecasting, sea ice hind cast, freeze-up, Burger
	Development of an accurate model of the Beaufort and Chukchi Ice Drift and Dispersion for Forecasting Spill Trajectories and Providing Decision Support for Spill Response	UAF-CMI	\$359,078	2013 -2016	spill response, oil trajectories, ice velocities, ice deformation, convergence zone
	Loss of Well Control Occurrence and Size Estimators for Alaska OCS	Bercha	\$298,540	2012 -2014	risk assessment, oil spill, offshore, onshore
	Update to the Fault Tree for Oil-spill Occurrence Estimators needed Under the Forthcoming BOEM 2012-2017, 5-Year Program	Bercha	\$229,840	2011 - 2016	risk assessment, arctic conditions
	Development of a Very High-resolution Regional Circulation Model of Beaufort Sea Nearshore Areas	Pending			barrier islands, eddies
3.5.2	Encourage coordinated approaches that better represent Arctic processes in Earthsystem models				
	Not Jurisdiction of BOEM				
3.5.3	Build Arctic and subsystem models for coupling with regional and global approaches				
	Beaufort and Chukchi Seas Mesoscale Meteorology Model	UAF	\$1,784,735	2006 - 2012	weather, forecasting, model, surface winds, meteorology, buoys
	Adaptation of Arctic Circulation Model	Rutgers	\$349,999	2010 - 2012	ocean currents, ice coverage, hind cast
	Development of a Very High-resolution Regional Circulation Model of Beaufort Sea Nearshore Areas	Pending			barrier islands, eddies
3.5.4	Develop models of Arctic land ice mass loss, connections to ocean and atmospheric variability, and implications for sea level				
	Not Jurisdiction of BOEM				
3.5.5	Increase Arctic model resolution to improve prediction and inform future research and observations				
	Enhanced Verification and Interpretation of Freeze-up Conditions for the Northeast Chukchi Shelf: Field Observations and Process Studies; Freeze-up Forecasts	UAF	\$1,995,000	2014 - 2019	sea ice forecasting, sea ice hind cast, freeze-up, Burger
	Beaufort and Chukchi Seas Mesoscale Meteorology Model	UAF	\$1,784,735	2006 - 2012	forecasting model, winds, meteorological stations, buoys, WRF
	Arctic Tracer Release Experiment: Applications for Mapping Spilled Oil in Arctic Waters	UAF	\$1,249,977	2013 - 2016	dispersed dye , drifters, high frequency radar, gliders, drifters, NOAA
	Development of an accurate model of the Beaufort and Chukchi Ice Drift and Dispersion for Forecasting Spill Trajectories and Providing Decision Support for Spill Response	UAF-CMI	\$359,078	2013 -2016	spill response, oil trajectories, ice velocities, ice deformation, convergence zone

ARP Item	Research Topic	BOEM Partner	BOEM Funding	Study Duration	Key Words
	Adaptation of Arctic Circulation Model	Rutgers	\$349,999	2010 - 2012	ocean currents, ice coverage, hind cast
	Development of a Very High-resolution Regional Circulation Model of Beaufort Sea Nearshore Areas	Pending			
3.5.7	Integrate Arctic climate-model results with observational validation and verification to understand the principal drivers and uncertainties of Arctic climate changes				
	Ecosystem Observations in the Chukchi Sea: Biophysical Mooring and Climate Modeling	NOAA	\$2,068,928	2010 - 2015	ice coverage, forecast
	Enhanced Verification and Interpretation of Freeze-up Conditions for the Northeast Chukchi Shelf: Field Observations and Process Studies; Freeze-up Forecasts	UAF	\$1,995,000.00	2014 - 2019	sea ice forecasting, sea ice hind cast, freeze-up, Burger
	Satellite-Tracked Drifter Measurements in the Northeast Chukchi Sea	UAF	\$459,892	2011- 2015	ocean currents, current velocities
	ShoreZone Mapping of the North Slope of Alaska	Nuka	\$554,121	2011 - 2015	imagery, groundtruthing, geomorphic, nearshore habitat, mapping
3.6	Assess Strengths And Vulnerabilities Of Arctic Communities Facing The Impacts Of Climate Change And Assist In Developing Adaptation Strategies And Tools To Maximize Sustainability, Well-Being, And Cultural And Linguistic Heritage				
3.6.1	In collaboration with local communities, develop methods for assessing community sustainability and resilience and determine the efficiency of current adaptation strategies				
	The Study of Sharing Networks to Assess the Vulnerabilities of Local Communities to Oil and Gas Development Impacts in Arctic Alaska	UAF	\$785,000	2007 - 2013	subsistence, Wainwright, Kaktovik, Venetie, Iñupiat
	Social Indicators in Coastal Alaska: Arctic Communities	Stephen Braund	\$669,659	2011 - 2014	marine mammal, fish, subsistence, harvest
	Aggregate Effects Research & Environmental Mitigation Monitoring of Oil Operations in the Vicinity of Nuiqsut	Stephen Braund	\$373,298	2009 - 2013	Iñupiat, oil, gas, subsistence, harvest
3.6.2	Identify the current vulnerabilities of Arctic communities and ecosystems to climate change and explore their interactions with socio-economic and other stressors				
	Social Indicators in Coastal Alaska: Arctic Communities	Stephen Braund	\$669,659	2011 - 2014	traditional knowledge, climate change, subsistence, economy,
	Aggregate Effects Research & Environmental Mitigation Monitoring of Oil Operations in the Vicinity of Nuiqsut	Stephen Braund	\$393,490	2009 - 2013	Iñupiat, Nuiqsut, oil, gas, subsistence, harvest, mitigation
	Analysis of Variation in Abundance of Arctic Cisco in the Colville River: Study	ABR	\$345,520	2004 - 2007	traditional knowledge, Iñupiat, Nuiqsut, arctic cisco, climate change
3.6.3	Develop projections of future climate scenarios and demographic conditions to forecast potential strengths and weaknesses of human and ecological systems in the Arctic				
	North Slope Borough Economy: 1975 to Present	Northern Economics	\$145,255	2005 - 2006	employment, income, demography
3.6.4	Assist Arctic communities in documenting, revitalizing, and strengthening indigenous languages and cultural heritage				
	A Year in the Life of a Bowhead Whale: An Animated Film	UAF-CMI	\$87,587	2012 - 2014	Alaska Museum of the North, animated film, production, storyboarding
	Traditional Knowledge Implementation: Accessing Arctic Community Panels of Subject Matter Experts	Pending			

ARP Item	Research Topic	BOEM Partner	BOEM Funding	Study Duration	Key Words
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3.7	Understand Factors That Impact Human Health In The Arctic, Including Infectious And Non-Communicable Diseases, Climate Change, Environmental Contamination, And Behavior And Mental-Health Disorders				
3.7.1	Continue to expand circumpolar surveillance and research for infectious diseases, non-communicable diseases, trauma, injury, sanitation services, and indoor air quality to help prevent morbidity and mortality				
	Not Jurisdiction of BOEM				
3.7.2	Continue interagency collaboration to monitor the impacts of climate change and environmental contaminants on human health and wildlife				
	Chukchi Sea Offshore Monitoring in Drilling Area (COMIDA): Chemistry and Benthos	UT-A	\$2,887,495	2008 - 2012	benthic biota, food web, sediment chemistry, contaminants
	ANIMIDA III: Contaminants, Sources, and Bioaccumulation	Olgoonik	\$2,700,000	2013 - 2017	long term monitoring, sediment, bivalves, amphipods, hydrocarbons
	Arctic Air Quality Impact Assessment Modeling	ERG	\$1,751,036	2013 - 2016	pollutants, air quality
	Analysis of Variation in Abundance of Arctic Cisco in the Colville River: Study	ABR	\$345,520	2004 - 2007	traditional knowledge, Iñupiat, Nuiqsut, fish, climate change
	Sensitivity to Hydrocarbons and Baselines of Exposure in Marine Birds on the Chukchi and Beaufort Seas	UAF-CMI	\$194,676	2013 - 2016	marine birds, crude oil, cytochrome p450, 7-ethoxyresorufin- <i>O</i> -deethylase
	ANIMIDA III: Arctic Kelp Communities in the Beaufort Sea: Sentinels of Long-Term Change	UT-A	\$128,774	2014 - 2017	cANIMIDA, Camden Bay, chemical fingerprint, biota, sediments
3.7.3	Continue to support investigator-initiated research in major health priority areas such as mental health including substance abuse and suicide, obesity, diabetes, and cancer				
	Not Jurisdiction of BOEM				
3.7.4	Continue to engage indigenous communities and tribal groups in research activities and projects in the Arctic				
	Bowhead Whale feeding Variability in the Western Alaskan Beaufort Sea: Oceanography and Feeding	NOAA/ Others	\$8,095,000	2006 - 2013	feeding, variability, behavior, Cross Island, Barrow , aircraft, tagging
	Satellite Tracking of Bowhead Whales: Habitat Use, Passive Acoustic and Environmental Monitoring	ADFG	\$2,699,857	2012 - 2015	tagging, Saint Lawrence, Point Hope, Canada,
	Distribution of Fish, Crab and Lower Trophic Communities in the Chukchi Sea Lease Area (Arctic Ecosystem Integrated Survey)	UAF/NOAA	\$2,600,000	2012 - 2016	ecology, demersal, pelagic, invertebrate, food-web
	Ice Seal Movements and Foraging: Village based Satellite Tracking and Acoustic Monitoring of Ringed, Bearded, and Spotted Seals With the TEK component, this should be included here	ADFG	\$1,174,994	2013 - 2017	Traditional knowledge, satellite telemetry, habitat, satellite mapping
	COMIDA: Impact Monitoring for Offshore Subsistence Hunting	Stephen Braund	\$999,805	2009 - 2013	Iñupiat, harvest, Point Lay, Wainwright, climate, sea ice, traditional knowledge,
	The Study of Sharing Networks to Assess the Vulnerabilities of Local Communities to Oil and Gas Development Impacts in Arctic Alaska	UAF	\$785,000	2007 - 2013	subsistence, Wainwright, Kaktovik, Venetie,
	Social Indicators in Coastal Alaska: Arctic Communities	Stephen Braund	\$669,659	2011 - 2014	communities, economic, cultural, subsistence, Arctic Council
	Subsistence Mapping of Nuiqsut, Kaktovik and Barrow : Past and Present Comparison	Stephen Braund	\$399,994	2004 - 2007	Iñupiat, harvest, traditional knowledge
	Analysis of Variation in Abundance of Arctic Cisco in the Colville River: Study	ABR	\$345,520	2004 - 2007	traditional knowledge, Iñupiat, Nuiqsut, fish, climate change
	Continuation of Impact Assessment for Cross Island Whaling Activities - Beaufort Sea	ASCR	\$328,507	2008 - 2013	Nuiqsut, subsistence, Nuiqsut Whalers Association, Alaska Eskimo Whaling Commission
	Sea Level Measurements along the Alaska Chukchi and Beaufort Coasts	UAF-CMI	\$72,178	2014 - 2017	ocean currents, storm surges