

Projects in the Fram Centre Flagships for 2016

Research areas/Project titles	Project leader (s)	Participating institutions	Flagship	E-mail project leader
Effects of climate change on sea and coastal ecology in the north (Fjord and Coast)				
<i>Physical-biological coupling: Oceanography and habitat use by predators and their prey</i>				
Effects of climate on cod life history and ecology along a temperate-arctic gradient	Hector Andrade	ApN, IMR, UNIS, UT, BC	Fjord and Coast	hector.andrade@akvaplan.niva.no
Effects of oceanic inflow and glacial runoff on fjord circulation in Kongsfjorden, Svalbard; establishment of a high resolution ocean circulation model system	Arild Sundfjord	NPI, IMR, UNIS	Fjord and Coast	arild.sundfjord@npolar.no
The role of the harbour porpoise	Ulf Lindstrøm	IMR, UiT, ApN, NAMMCO, NTNU, UoStA	Fjord and Coast	ulf.lindstroem@imr.no
How do a dominant predator and climate shape fish biodiversity over space and time in large marine ecosystems?	Kari Ellingsen	NINA, IMR, UiT, PINRO, BedIn, MU	Fjord and Coast	kari.ellingsen@nina.no
Seabird habitat use and migration strategies	Børge Moe	NINA, ApN, UiT, NILU, UNIS, NPI, NTNU, UoO, CNRS, LRU, UoGr, IMARES, AU, AARI, UoF, CEH BAS, UAF, Uols, UTu,	Fjord and Coast	borge.moe@nina.no
The coastal migratory behavior of anadromous fish	Guttorm N. Christensen	ApN, UiT, NIVA, FOC, UoWa	Fjord and Coast	gnc@akvaplan.niva.no
Costal heritage for sustainable regional development	Einar Eythorsson	NIKU, NORUT, TCD	Fjord and Coast	einar.eythorsson@niku.no

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Timing of reproduction in seabirds	Zofia Burr	UNIS, NPI, NINA, UiT, ApN, IMR, BS	Fjord and Coast	zofia.burr@gmail.com
Ecological and commercial implications of extreme winter arrivals of herring and whales into North-Norwegian fjord systems	Martin Biuw	ApN, NINA, UiT	Fjord and Coast	mab@akvaplan.niva.no
Mapping sea ice characteristics	Sebastian Gerland	NPI, MET, NORUT, UiT	Fjord and Coast	sebastian.gerland@npolar.no
<i>Structure, function and change in Arctic and boreal fjord ecosystems</i>				
Recovery of coastal kelp ecosystems – driven by climate change or predators?	Hartvig Christie	NIVA, IMR, ApN, NBIC	Fjord and Coast	hartvig.christie@niva.no
Salmon at sea in a changing world	Martin Svenning	NINA, UiT, LUKE, UTu, FOC, UoWa	Fjord and Coast	martin.svenning@nina.no
Carbon flux dynamics in ice-free versus ice-covered Svalbard fjords during the last decade: Exploring the effects of sea ice variability on the downward flux of biogenic particles	Gerald Darnis	ApN, UiT, UNIS, NPI, UoLa SAMS	Fjord and Coast	gerald.darnis@akvaplan.niva.no
The Arctic scallop <i>Chlamys islandica</i> as a biosensor for detection of effects of climate upon ecosystem functioning and anthropogenic impact in Svalbard	Lionel Camus	ApN, UiT, CNRS	Fjord and Coast	lionel.camus@akvaplan.niva.no
Life on the edge - Blue mussels on Svalbard	Jørgen Berge	UiT, ApN, UNIS, BC	Fjord and Coast	jorgen.berge@uit.no
An integrated approach to understanding weather–ocean interactions along seabird feeding routes	Kjell Einar Erikstad	NINA, IMR, BS, NTNU, UoR	Fjord and Coast	kiell.e.erikstad@nina.no
Direct age determination in crustaceans: Validation of periodicity of age bands in Barents Sea red king crabs	Bodil Bluhm	UiT, ApN, UNIS, BC, UoNB	Fjord and Coast	bodil.bluhm@uit.no
Marine base maps for the Porsanger Fjord	Aivo Lepland	NGU, IMR, NRPA	Fjord and Coast	aivo.lepland@ngu.no
Climate driven regime shifts in arctic rocky bottom	Raul Primicerio	UiT, ApN, UNIS	Fjord and Coast	raul.primicerio@uit.no
High latitude fjord ecosystems	Torild Johansen	IMR, ApN, UiT	Fjord and Coast	torild.johansen@imr.no
Meroplankton biodiversity	Janne Søreide	UNIS, ApN, UoGd, PAS	Fjord and Coast	janne.soreide@unis.no

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Sea ice in the Arctic Ocean, Technology and Governance (Arctic Ocean)				
<i>Sea ice, ecosystems and models</i>				
Developing modelling tools to understand the role of solar radiation to sea ice mass balance in a seasonally ice covered Arctic	Mats Granskog	NPI, MET, UiT, ApN, FMI, CRRL, AWI	Arctic Ocean	mats.granskog@npolar.no
Long-term variability and trends in the Atlantic water inflow region	Sebastian Gerland	NPI, IMR, UNIS, UiT, PAS, WHOI	Arctic Ocean	sebastian.gerland@npolar.no
Mesoscale modeling of ice, ocean and ecology of the Arctic Ocean	Tore Hattermann	ApN, IMR, NPI, SINTEF, MET	Arctic Ocean	tore.hattermann@akvaplan.niva.no
Ecosystem modeling of the Arctic Ocean around Svalbard	Pedro Duarte	NPI, ApN, NIVA, UiT	Arctic Ocean	pedro.duarte@npolar.no
Holocene ocean and sea ice history at north-east Svalbard - from past to present warm extremes	Katrine Husum	NPI, UiT, UNIS, BAS, NCAOR	Arctic Ocean	katrine.husum@npolar.no
Using tracers, atmospheric indices and model output to explain changes in the Arctic Ocean inflow and outflow through Fram Strait	Paul Dodd	NPI, NRPA, ApN, IMR, OASYS	Arctic Ocean	paul.dodd@npolar.no
<i>Driving forces and development of new industry</i>				
Shipping in the Arctic - drivers and forecasts	Eirik Mikkelsen	NORUT, NCA, Capia.no, UiT, FNI, ApN	Arctic Ocean	Eirik.Mikkelsen@norut.no
Information systems in the Arctic Ocean: Drivers, architecture, and effects on the development of marine economic activities	Maaïke Knol	UiT, NPI, MET, WU, SCNN	Arctic Ocean	maaike.knol@uit.no
<i>Technology</i>				
Ice floe interaction with ships and waves	Karl Gunnar Aarsæther	SINTEF, UiT, TO, Opilio Inc.	Arctic Ocean	Karl.Gunnar.Aarsather@sintef.no

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Ocean acidification and ecosystem effects in northern waters (Ocean acidification)				
<i>Understanding the physical and chemical mechanisms controlling ocean acidification (OA) in Arctic waters – past, present and future</i>				
Current OA state and variability	Agneta Fransson	NPI, NIVA, IMR, UiT, UNIS, BedIn	Ocean acidification	agneta.fransson@npolar.no
Biogeochemical drivers and climate change on OA	Agneta Fransson	NPI, IMR, UoH, BedIn	Ocean acidification	agneta.fransson@npolar.no
<i>Biological effects of Ocean Acidification (OA)</i>				
Physiological challenges of OA on copepods	Howard Browman	IMR, NPI, BOS, UoM, CU, RU	Ocean acidification	howardb@imr.no
Transgenerational effects of OA	Caludia Halsband	ApN, NPI	Ocean acidification	claudia.halsband@akvaplan.niva.no
Evolutionary adaptation during Arctic OA	Peter Thor	NPI, ApN, UNIS, UQAR, UoGo, DTU	Ocean acidification	peter.thor@npolar.no
Ontogeny and physiological constraints on early life history stages of <i>Lophelia pertusa</i>	Johanna Järnegren	NINA, FSU	Ocean acidification	johanna.jarnegren@nina.no
Pteropod shell thickness and composition in different regimes	Agneta Fransson	NPI, IMR, JAMSTEC, PAS	Ocean acidification	agneta.fransson@npolar.no
<i>Coupled climate-ecosystem-acidification modelling from organism to basin</i>				
Validation and comparison of coupled physical-biogeochemical models	Philip Wallhead	NIVA, IMR	Ocean acidification	philip.wallhead@niva.no
Investigate pelagic ecosystem sensitivity and feedbacks to Arctic OA	Philip Wallhead	NIVA, IMR	Ocean acidification	philip.wallhead@niva.no
Population-level effects of Arctic OA on copepods	Pedro Duarte	NPI	Ocean acidification	pedro.duarte@npolar.no

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Benthic-pelagic coupling of Arctic OA	Evgeny Yakushev	NIVA	Ocean acidification	evgeny.yakushev@niva.no
<i>Socio-economic consequences and management options</i>				
Socio-economic consequences and management options of OA	Eirik Mikkelsen	NORUT, UiT, NIVA, UoQ	Ocean acidification	eirik.mikkelsen@norut.no

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Effects of climate change on terrestrial ecosystems, landscapes, society and indigenous peoples (Terrestrial)				
<i>Vegetation state change and herbivore management</i>				
After-the-Pest: Ecosystem transitions following insect pest outbreaks induced by climate change in the European high North	Jane Uhd Jepsen	NINA, UiT	Terrestrial	jane.jepsen@nina.no
Long term vegetation change in alpine areas in Northern-Norway and Poland – relation to climate and grazing	Jutta Kapfer	NIBIO, UiT, RAS	Terrestrial	jutta.kapfer@nibio.no
Moose in Finnmark - spatial ecology and management in a changing landscape	Rolf Rødven	NIBIO, NINA, UiT	Terrestrial	rolf.rodven@nibio.no
<i>Ecosystem effects of extreme climate events and changing seasons</i>				
Use of remote sensing for increased precision in forage production	Marit Jørgensen	NIBIO, NORUT, UiT	Terrestrial	marit.jorgensen@nibio.no
Ecosystem stress from the combined effects of winter climate change and air pollution – how do the impacts differ between biomes?	Jarle W. Bjerke	NINA, MET, NORUT	Terrestrial	jarle.werner.bjerke@nina.no
Sentinel synergy framework – satellite observation of growth seasons in alpine and Arctic ecosystems	Eirik Malnes	NORUT, NINA, UiT	Terrestrial	Eirik.Malnes@norut.no
Effect of climate extremes on inland production of grass in North-Norway	Gregory Taff	NIBIO, NINA	Terrestrial	gregory.taff@nibio.no
Phenological synchrony of arctic plants and their pollinators at altered snow regimes at Svalbard	Elisabeth Cooper	UiT, NINA	Terrestrial	elisabeth.cooper@uit.no

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<i>Capacity for adaptation in indigenous people and local societies</i>				
Territoriality - mobility and fragmentation in the reindeer husbandry	Marius Warg Næss	NIKU, NINA	Terrestrial	marius.naess@niku.no
Integrative studies of pastoral societies ability to adapt rapid climate and ecosystem changes	Stine Barlindhaug	NIKU, UiT, NMBU	Terrestrial	stine.barlindhaug@niku.no
<i>Adaptive management of ecosystem services</i>				
Adaptive goose management beyond borders	Ingunn Tombre	NINA, NIKU, NORUT	Terrestrial	ingunn.tombre@nina.no
Sustain – climate changes and effects on species important for ecosystem services	John-André Henden Sandra Hamel	UiT, NPI, NINA	Terrestrial	john-andre.henden@uit.no sandra.hamel@uit.no
Effects of climate changes on the use of ecosystem services by the local society	Vera Hausner	UiT, NINA	Terrestrial	vera.hausner@uit.no
<i>Observation systems for climate effects</i>				
COAT: Climate-ecological-Observatory-for-Arctic-Tundra	Rolf Ims	UiT, NINA, NPI, UNIS, MET	Terrestrial	rolf.ims@uit.no
<i>Outreach</i>				
TundraSchoolnet extended – Research-based activities for schools in northern areas	Ingrid Jensvoll	UiT, NINA	Terrestrial	ingrid.jensvoll@uit.no

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Hazardous substances – effects on ecosystems and human health (Hazardous substances)				
<i>The effects of contaminants on human health and Arctic communities</i>				
Dioxins in reindeer and reindeer herders (and their families) from Sør-Varanger – lessons learned and risk management in theory and practice	Torkjel Sandanger	NILU, UiT, NORUT, ApN TI, UoOu	Hazardous substances	torkjel.sandanger@uit.no torkjel.sandanger@nilu.no
Human biomonitoring and mechanistic modelling of organic compounds across time (1986-2007) in 30 year old Tromsø men	Linda Hanssen	NILU, UiT, ApN, UNN, INSPQ	Hazardous substances	linda.hanssen@nilu.no
<i>The fate and effects of contaminants in Northern ecosystem in combination with climate change, natural and anthropogenic stressors</i>				
From FRAM research to sound policy making: Assessment of siloxane use and its potential risk to Arctic environments	Nicholas Warner	NILU, ApN, UoL, SU	Hazardous substances	nicholas.warner@nilu.no
Climate mediated increases in organic matter export to arctic coastal waters	Amanda Poste	NIVA, ApN, UiT, NPI, Salt.nu, UoO	Hazardous substances	amanda.poste@niva.no
Impacts of environmental contaminants and natural stressors on northern raptors	Jan Ove Bustnes	NINA, NILU, NTNU, UiT, UoA, AU, UoMu	Hazardous substances	jan.o.bustnes@nina.no
Multi-stress relationships in seabird populations: interactions between natural stressors and environmental contaminants	Jan Ove Bustnes	NINA, NPI, NILU, ApN, UoO, CEBC	Hazardous substances	jan.o.bustnes@nina.no
Microplastics in arctic marine food chains; biological uptake pathways and socio-economic consequences	Claudia Halsband Dorte Herzke	ApN, NIVA, NILU, IMR, NINA, NORUT, NPI, UNIS, Salt.nu, TM	Hazardous substances	claudia.halsband@akvaplan.niva.no dorte.herzke@nilu.no

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Contaminant levels and effects in killer (<i>Orcinus orca</i>) and humpback whales (<i>Megaptera novaeangliae</i>) present in Northern-Norway.	Jenny Bytingsvik	ApN, NIVA, NILU, UiT, IVM, VU	Hazardous substances	jby@akvaplan.niva.no
Is the immune defense of Arctic charr in Lake Ellasjøen, Bjørnøya, compromised by their pollutant burden?	Even H. Jørgensen	UiT, ApN, NILU, UoCa	Hazardous substances	even.jorgensen@uit.no
<i>Impact from industrial development and urbanization in the North - Fate and effects of pollutants on Arctic ecosystems</i>				
Transformation properties and environmental risk-pharmaceuticals	Roland Kallenborn	NMBU, UNIS, NILU, NORUT, NPI, ApN, SRCES-RAS	Hazardous substances	roland.kallenborn@nmbu.no
Single and mixture exposure of key Arctic contaminants (POPs, heavy metals and PAHs) in Icelandic scallops (<i>Chlamys islandica</i>) using <i>in vitro</i> approach.	Perrine Geraudie	ApN, NIVA, NILU, IDAEA-CSIC, LIENSs	Hazardous substances	pge@akvaplan.niva.no
Impact of Arctic urbanization on the occurrence of new “urban” contaminants in the Norwegian Arctic	Pernilla Bohlin Nizzetto	NILU, NIVA, ApN, RECETOX	Hazardous substances	pbn@nilu.no
<i>Risk governance - Communicating and applying research results</i>				
Case Orrefjell	Louise Kiel Jensen	NRPA, NORUT, NMBU, NGU	Hazardous substances	louise.kiel.jensen@nrpa.no
Bringing the Arctic perspective to global conventions – The role of science in the negotiations towards the adoption of the Minamata Convention	Froukje Maria Platjouw	NIVA, ApN, UiT	Hazardous substances	fmp@niva.no

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Environmental impacts of industrial activity in the north (MIKON)				
<i>Knowledge basis for ecosystem based management</i>				
Mapping and monitoring cultural heritage sites and environments in the Svalbard Archipelago	Stine Barlindhaug	NIKU, NINA, NORUT, NPI	MIKON	stine.barlindhaug@niku.no
Net environmental benefit analysis tool to assess the environmental effects of Arctic oil spills and oil spill response technologies	Lionel Camus	ApN, UiT, NPI, UNIS, Cedre, UoLa	MIKON	lionel.camus@akvaplan.niva.no
Ecosystem vulnerability assessment of resources in the Ecosystem vulnerability assessment of resources in the Barents Sea	Raul Primicerio	UiT, IMR, ApN	MIKON	raul.primicerio@uit.no
Ocean Health in Transition	Per Fauchald	NINA, UiT, NIVA, IMR, NORUT	MIKON	per.fauchald@nina.no
<i>Consequences for organisms and ecosystems</i>				
Development of model for prediction of eutrofication and sedimentation from fish cage farms	Ole Anders Nøst	ApN, NIVA, UiT, NORUT	MIKON	ole.anders.nost@akvaplan.niva.no
Fate and impact of mine tailings on marine Arctic ecosystems	Anita Evenset	ApN, NGU, IMR, NORUT, NRPA, SIO, UoG	MIKON	anita.evenset@akvaplan.niva.no
Arctic Cetaceans and Ocean Noise	Kit Kovacs	NPI, UiT	MIKON	kit.kovacs@npolar.no
Mineral extraction in the high North – radiological risks, impacts and mitigation	Louise Kiel Jensen	NRPA, NIVA, NMBU	MIKON	louise.kiel.jensen@nrpa.no

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<i>Consequences for cultural heritage and society</i>				
Sea urchin harvest: Ecosystem recovery, integrated management of social-ecological system, ecosystem service and sustainability	Wenting Chen	NIVA, UiT, Nofima, UoC	MIKON	wenting.chen@niva.no
The impact of extractive industries and tourism on socioecological dynamics in the Arctic	Vera Hausner	UiT, NINA	MIKON	vera.hausner@uit.no
Ecosystem services and coastal governance	Einar Eythorsson	NIKU, Nofima	MIKON	einar.eythorsson@niku.no

Abbreviations:

AARI: The Arctic and Antarctic Research Institute; **ApN:** Akvaplan-niva Inc.; **AU:** Aarhus University; **AWI:** Alfred Wegener Institute; **BAS:** British Antarctic Survey; **BC:** Bates College; **BedIn:** Bedford Institute; **BOS:** Bigelow Laboratory for Ocean Science; **BS:** The Bjerknes Centre; **CEBC:** Centre d'Études Biologiques de Chizé; **Cedre:** Centre of Documentation, Research and Experimentation on Accidental Water Pollution; **CEH:** The Centre for Ecology & Hydrology; **CNRS:** The National Center for Scientific Research; **CRRL:** Control/Robotics Research Laboratory (NYU Polytechnic School of Engineering); **CU:** Clemson University; **DTU:** Technical University of Denmark; **FMI:** Finnish Meteorological Institute; **FNI:** Fridtjof Nansen Institute; **FOC:** Fisheries and Oceans Canada; **FSU:** Florida State University; **JAMSTEC:** Japan Agency for Marine-Earth Science and Technology; **IDAEA-CSIC:** Institute of Environmental Assessment and Water Research – Spanish Council for Scientific Research; **IMARES:** Institute for Marine Resources & Ecosystem Studies; **IMR:** Institute of Marine Research; **INSPQ:** Public Health Expertise and Reference Centre - Québec; **IVM:** Institute for Environmental Studies; **LIENSs:** Littoral, Environment and Societies, La Rochelle University; **LRU:** La Rochelle University; **LUKE:** Natural Resources Institute Finland; **MET:** The Norwegian Meteorological Institute; **MU:** Massey University; **NAMMCO:** North Atlantic Marine Mammal Commission; **NBIC:** Norwegian Biodiversity Information Centre; **NCA:** The Norwegian Coastal Administration; **NCAOR:** National Centre for Antarctic and Ocean Research; **NGU:** Geological Survey of Norway; **NIBIO:** The Norwegian Institute of Bioeconomy Research; **NINA:** Norwegian Institute for Nature Research; **NIKU:** The Norwegian Institute for Cultural Heritage Research; **NILU:** Norwegian Institute for Air Research; **NIVA:** Norwegian Institute for Water Research; **NMBU:** Norwegian University of Life Sciences; **Nofima:** The Norwegian Institute of Food, Fisheries and Aquaculture Research; **NORUT:** Northern Research Institute; **NPI:** Norwegian Polar Institute; **NRPA:** Norwegian Radiation Protection Authority; **NTNU:** Norwegian University of Science and Technology; **OASYS:** Ocean Atmosphere Systems - Research; **PAS:** Polish Academy of Sciences; **PINRO:** Polar Research Institute of Marine Fisheries and Oceanography; **RAS:** Russian Academy of Sciences; **RECETOX:** Research Centre for Toxic Compounds in the Environment; **RU:** Ryerson University; **SAMS:** The Scottish Association for Marine Science; **SCNN:** Science Centre of Northern Norway; **SINTEF:** The Company for Industrial

and Technological Research; **SIO**: Scripps Institution of Oceanography; **SRCES-RAS**: Scientific Research Center for Ecological Safety - Russian Academy of Sciences; **SU**: Stockholm University; **TCD**: Trinity College Dublin; **TI**: Thule Institute; **TM**: Tromsø Municipality; **TO**: Troms Offshore; **UAF**: University of Alaska - Fairbanks; **UiT**: UiT The Arctic University of Norway; **UNIS**: The University Centre in Svalbard; **UNN**: University Hospital of North Norway; **UoA**: University of Antwerpen; **UoC**: University of California; **UoCa**: University of Calgary; **UoF**: University of Freiburg; **UoG**: University of Gent; **UoGd**: University of Gdańsk; **UoGo**: University of Gothenburg; **UoGr**: University of Groningen; **UoH**: University of Hokkaido; **UoIs**: University of Island; **UoL**: University of Leicester; **UoLa**: University of Laval; **UoO**: University of Oslo; **UoOu**: University of Oulu; **UoM**: University of Maine; **UoMu**: University of Murcia; **UoNB**: University of New Brunswick; **UoQ**: University of Queensland; **UoR**: University of Reading; **UoStA**: University of St. Andrews; **UoWa**: University of Waterloo; **UQAR**: Université du Québec à Rimouski; **UT**: University of Texas; **UTu**: University of Turku; **VU**: Vrije University Amsterdam; **WHOI**: Woods Hole Oceanographic Institution; **WU**: Wageningen University