

Cruise Report

**Alaska Monitoring and Assessment Program (AKMAP) Chukchi Sea 2012
Coastal Impact Assistance Program Assessment**

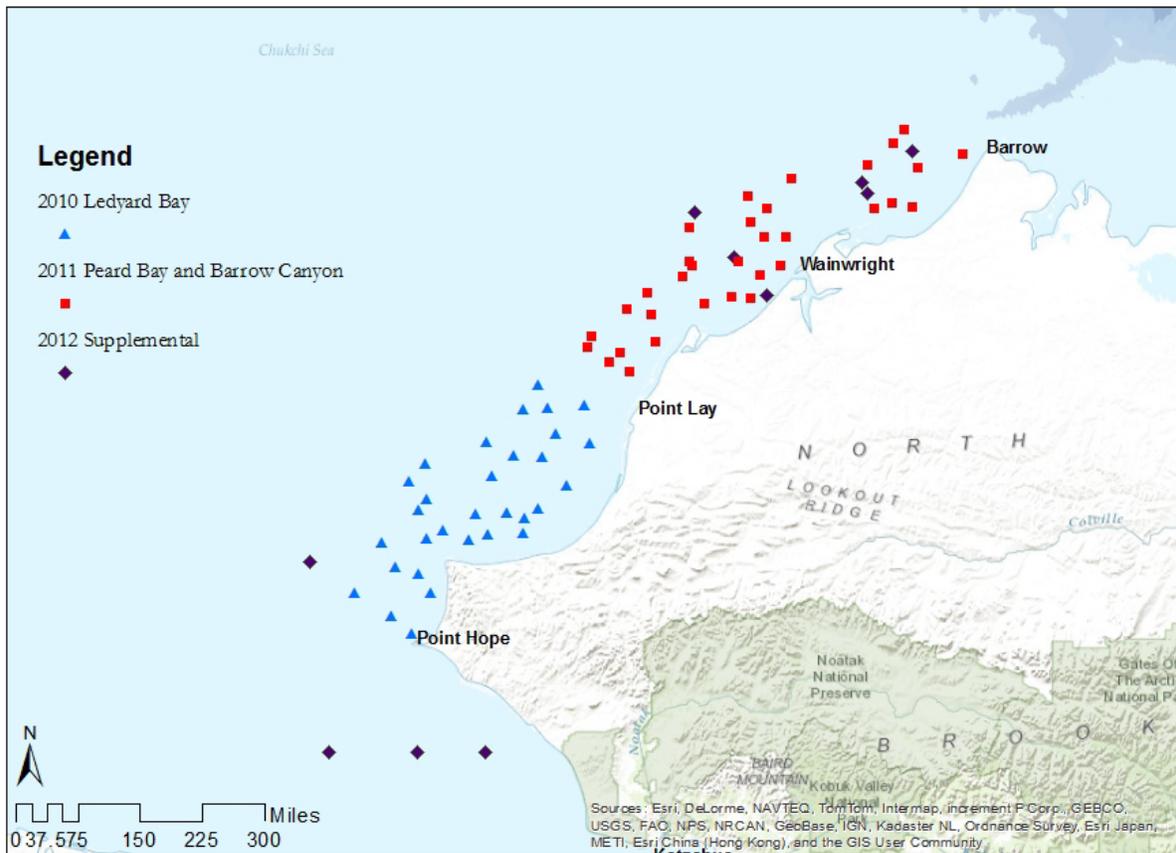
August 5 – 15, 2012

Acknowledgements

This report is funded (in part) with qualified outer continental shelf oil and gas revenues by the Coastal Impact Assistance Program, Fish and Wildlife Service, U.S. Department of the Interior.

NOAA provided major support in providing the NOAA *Fairweather* to support our sampling effort in 2012.

Alaska Monitoring and Assessment Program (AKMAP) Chukchi Sea 2010-2012 Stations



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Cruise Report

AKMAP Chukchi Sea 2012 Coastal Impact Assistance Program Assessment

August 5-15, 2012

R/V *Norseman II*

The Alaska Department of Environmental Conservation (DEC) with its University of Alaska partner established an Alaska Monitoring and Assessment Program (AKMAP) focused on conducting aquatic resource surveys of Alaska's waters. DEC and the University of Alaska Fairbanks, School of Fisheries and Ocean Sciences (UAF, SFOS) conducted research cruises in 2010 and 2011 to survey the Chukchi Sea coastal environment. In 2011, the National Oceanic and Atmospheric Administration (NOAA) National Status and Trends Program joined this effort. In 2012, the NOAA Alaska Coordinators' office offered berth space to AKMAP aboard the NOAA ship *Fairweather*. This opportunity would have allowed AKMAP to sample deeper locations in the Barrow Canyon area and to samples locations missed in previous years.

AKMAP used a statistical survey design for the Chukchi Sea assessment to provide for estimates of the spatial extent of water quality status based on stressors, such as chemical contaminants, water quality parameters (pH, temperatures, salinity, and dissolved oxygen) and indicators, such as benthic fish abundance. Environmental managers use this information to support the protection and restoration of coastal marine environments, mitigate damage to the marine ecosystem and implement discharge monitoring requirements in Alaska Pollution Discharge Elimination System (APDES) permits. The purpose of the 2012 cruise was to collect targeted samples from Barrow Canyon and southern Chukchi Sea locations for comparisons with the 2010 and 2011 sample results.

The AKMAP sampling team departed Kotzebue, AK on August 5th, to the *Fairweather* and departed for AKCH12-004 just to the southeast of Point Hope, AK. We arrived on station at 12:18 on August 7th. The field team consisted of 3 scientists. Stations sampled in 2012 are shown in Figure 1.

Although station sampling was planned in a zig-zag pattern along the ships hydrograph survey lines as sites came in proximity to planned lines, sites were sampled opportunistically due to sea ice. Although the 2012 sea ice was at the lowest recorded levels, a large pack of sea ice was circulating in the Chukchi Sea region, with a large part of our sampling area covered by this ice. The *Fairweather* was very accommodating in navigating around and through ice patterns in an attempt to reach our stations. Unfortunately, we were not able to reach the Barrow Canyon and northwest Chukchi stations. Over the 11-day sampling period, 10 targeted stations were occupied. Multiple delays were experienced due to ice patterns and navigational concerns. Activities conducted at stations are shown in Table 1, with species associated with contaminant sampling listed.

Table 1. Summary of data collected during the AKMAP 2012 Chukchi Sea Survey.

Date Sampled	Time	Site ID	Consecutive #	Depth (m)	Latitude	Longitude	CTD Collection	Van-Veen Grab	Air Hydrocarbon Sample
8/7/2012	12:18	AKCH12-004	1	37	67.64635	-165.553	NOAA	X	
8/7/2012	3:44	AKCH12-003	2	44	67.64187	-166.7421	NOAA	X	X
8/7/2012	8:20	AKCH12-002	3	45	67.64663	-168.2814	NOAA	X	
8/8/2012	9:05	AKCH12-001	4	53	68.87859	-168.6154	NOAA	X	X
8/9/2012	21:50	AKCH12-005	5	52	71.08437	-158.8609	NOAA	X	
8/12/2012	21:55	AKCH12-006	6	84	71.14049	-158.9712	NOAA	X	
8/13/2012	1:37	AKCH12-009	7	112	71.31950	-158.0881	NOAA	X	
8/14/2012	4:25	AKCH12-DF005	8	40	70.97517	-161.8952	NOAA	X	
8/14/2012	7:00	AKCH12-DF003	9	38	70.70988	-161.1877	NOAA	X	
8/14/2012	9:50	AKCH12-DF001	10	13	70.49602	-160.6245	NOAA	X	

Date Sampled	Time	Site ID	Specimens collected for contaminant analysis		
8/7/2012	12:18	AKCH12-004			
8/7/2012	3:44	AKCH12-003			
8/7/2012	8:20	AKCH12-002	snails	bi-valves	
8/8/2012	9:05	AKCH12-001			
8/9/2012	21:50	AKCH12-005			
8/12/2012	21:55	AKCH12-006	bi-valves		
8/13/2012	1:37	AKCH12-009			
8/14/2012	4:25	AKCH12-DF005			
8/14/2012	7:00	AKCH12-DF003	polychaetes		
8/14/2012	9:50	AKCH12-DF001	amphipod	clams	brittle star

Station sampling activity typically occurred, in the following sequence: air hydrocarbon sample collection (randomly chosen sites); conductivity, temperature and depth (CTD) profiles; and Van-Veen grab sediment collection.

Macroinvertebrate samples were collected, though due to time constraints only a single sample was collected at each station. At some stations biological samples were also taken for potential contaminant or stable isotope analyses. All biological, and sediment samples were preserved (frozen, formalin, or refrigerated) on board. Samples will be analyzed at either at UAF or Texas A&M Geological Environmental Research Group (GERG) laboratory. Analytes that are typically run on the collected environmental media (sediments and tissues) are shown in Table 2.

Table 2. Analytes

Analytes	Marine Sediments	Biological Tissue Samples
Hydrocarbons	X	X
PCB's & Organochlorine pesticides	X	X
Sediment Chlorophyll a	X	
Sediment Grain Size	X	
Stable Isotopes (¹³ C& ¹⁵ N)	X	X
Total Inorganic Carbon	X	
Total Organic Carbon	X	
Trace Metals	X	X
% Lipids		X

Data was collected by Fairweather and the DEC AKMAP scientific crew. The CTD profile was performed by *Fairweather's* hydrograph survey crew. Benthic infaunal, sediment grain size, and chemistry samples were collected by AKMAP using a double Van Veen sediment sampler. Rocks and cobble at one site prevented the collection of sediment samples. Benthic infaunal samples from all sites were washed on a 1mm mesh screen. The benthic infaunal samples will be processed for taxonomic identification. Marine bird and marine mammal observations were conducted by *Fairweather* crew. Once the *Fairweather* collected data are analyzed a report will be provided to AKMAP.

On August 16th, the AKMAP scientific team departed the *Fairweather* in Barrow, AK. The success of this cruise was attributed to the following outstanding personal:

<u>Crew of the NOAA <i>Fairweather</i></u>	<u>Scientific Crew</u>
Commander James Crocker	Douglas Dasher, UAF
Executive Office Lt. Matthew Jaskoski	Terri Lomax, DEC
	Ian Hartwell, NOAA

Numerous other hydrograph, ship support and engineering crew of the NOAA *Fairweather*.

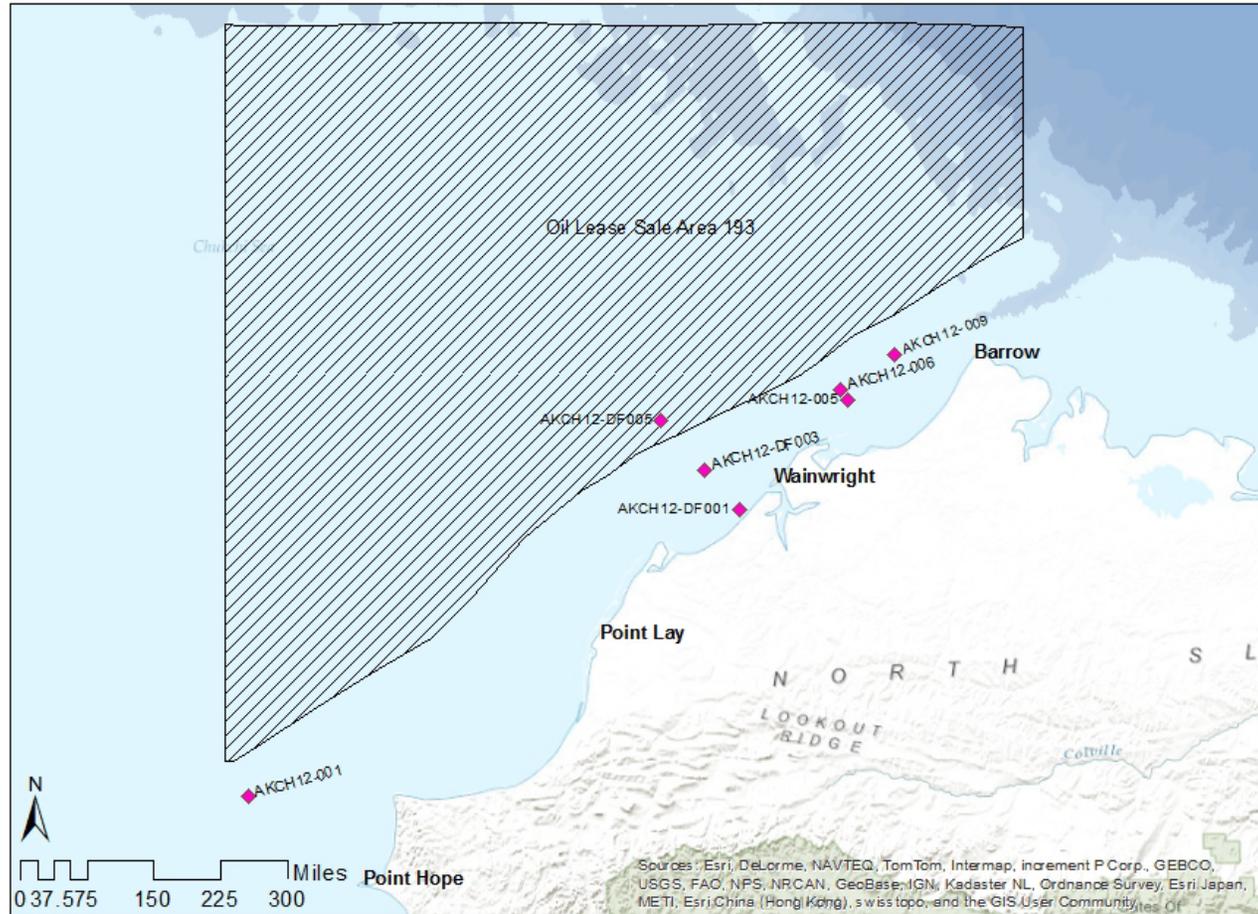
Douglas Dasher, Ph.D., Affiliate Professor UAF SFOS
 Chief Scientist
 March 20, 2013

Disclaimer

The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the opinions or policies of the U.S. Government. Mention of trade names or commercial products does not constitute their endorsement by the U.S. Government.

Figure 1 - 2012 AKMAP Chukchi Sea Stations

Alaska Monitoring and Assessment Program (AKMAP) Chukchi Sea 2012 Stations



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AKMAP CIAP Chukchi Sea 2012 Scientific Crew



Dr. Doug Dasher (UAF) and Dr. Ian Hartwell (NOAA), from right to left



Terri Lomax (ADEC)