2010 DBO International Pilot Project

DBO 2010 Data Parameter Matrix (SE Chukchi Sea-SECS) and Barrow Canyon (BC)

Cruise (DBO PI Lead)	Period (DBO lines)	CTD*	Chl-extracts	Nutrients	Algae-Ice/Phyto-plankton: size, biomass, composition	Zooplankton: size, biomass, composition	Benthos: size, biomass, composition	Seabird surveys	Marine Mammal surveys
Healy 1001 (Pickart)	June-July (both)	x	x	x	x			x	
Sir Wilfrid Laurier (Vagle)	July (both)	x	x-SECS only	x		x**	x**	x	
Moana Wave** (Grebmeier)	July-Aug (both**)	x	x	x	x	x	x	x	x
Xuelong (He)	July-Aug	x	x	x	x	x	x***		
Annika Marie (Ashjian)	August (BC)	x	x	x	x	x		x	x
Alaskan Enterprise (Napp/CHAOZ)	Aug-Sept (BC)	x							x
Khromov (Woodgate) (RUSALCA CS line)	Aug (SECS)	x	x	x	x	x			x
Healy 1003 (Pickart)	Sept (BC)	x		x				x	x
Mirai (Itoh)	Oct (BC; one stn SECS)	x	x	x		x (1 stn)			
Sum data sets		**9**	**7**	**8**	**5**	**6**	**3**	**5**	**5**

*=T, S, plus some cruises transmissivity, fluorescence (chlorophyll), CDOM, dissolved oxygen, pH

**=all water column, plankton and benthic data at "hotspot" sites both areas, plus nearshore stn SECS line; seabird/marine mammal

***=3 stations per transect

2011 DBO International Project

DBO 2011 Data Parameter Matrix (SChukchi Sea-SCS) and Barrow Canyon (BC)

Cruise (DBO PI Lead)	Period (DBO lines)	CTD*	Chlorophyll-extractions	Nutrients	Algae-Ice/Phyto-plankton: size, biomass, composition	Zooplankton: size, biomass, composition	Benthos: size, biomass, composition	Seabird surveys	Marine Mammal surveys
Healy 1101 (Pickart and Arrigo)	June 15-July 25 (both)	x	x	x	x				
Sir Wilfrid Laurier (Vagle and Grebmeier)	July 6-21 (both)	x	x	x	x	x	x	x	x
Araon (Chung)	July 29-? Aug	x	x						
Khromov (Woodgate)	July 9-25 (SECS)=RUS ALCA CS line	x	x	x		x			x
Shell cruise (Weingartner)	August	x				x	x	x	x
Annika Marie (Ashjian)	August (BC)	x	x	x		x			x
Alaskan Enterprise (Napp/CHAOZ)	Aug-Sept (BC)	x				x			x
Westward Wind (Day)	Aug-Oct (BC, uncertain)								
Healy 1003 (Pickart)	Sept (BC)	x		x				x	
SUM		**8**	**4**	**5**	**2**	**5**	**2**	**3**	**5**

*=T, S, plus some cruises transmissivity, fluorescence (chlorophyll), CDOM, dissolved oxygen, pH

2011 DBO International DBO Project

Dates (2011) /Port calls	Ship (DBO line, ++if both lines)	Project	PAG contact	Chief Scientist
July 15-25 (Dutch Harbor-Seward)	USCGC Healy***	ICESCAPE (NASA)	Robert Pickart rpickart@whoi.edu Karen Frey	Kevin Arrigo Kevin.arrigo@healy.polarscience.net
July 6-21 (Victoria, BC-Barrow)	Sir Wilfrid Laurier***	C30	Jackie Grebmeier jgrebmei@umces.edu Robert Fudge	Svein Vagle Svein.Vagle@dfo-mpo.gc.ca
July –August (Dutch Harbor)	RV Araon (SCS)	Korean Expedition (KOPRI)	Sung-Ho Khang shkang@kopri.re.kr	Kyungho Chung khchung@kopri.re.kr
July 13-29 (Nome-Nome)	Khromov (SCS)	RUSALCA	Kathy.Crane@noaa.gov	Rebecca Woodgate woodgate@apl.washington.edu
August (Barrow-Barrow)	Annika Marie (BC)	BOWFEST	Carin Ashjian cashjian@whoi.edu	Carin Ashjian cashjian@whoi.edu
August -Sept	Mystery Bay (BC)	Chukchi Acoustics, Oceanography, and Zooplankton Study (CHAOZ) (NOAA)	Jeff.Napp@noaa.gov Sue.Moore@noaa.gov	Catherine.Berchok@noaa.gov Phyllis.Stabeno@noaa.gov
August-October	Westward Wind (BC)	Shell-Conoco Phillips Environmental Program	Tom Weingartner weingart@ims.uaf.edu	Bob Day bday@abrinc.com John Burns jburnssr@gci.net
October	Healy (BC)	AON	Robert Pickart rpickart@whoi.edu	Robert Pickart rpickart@whoi.edu

2012: Araon, Khromov, Xuelong, Laurier, Healy
2013: Mirai, COMIDA-Hanna Shoal (Grebmeier)
2014: Xuelong, COMIDA-Hanna Shoal (Grebmeier)

Preliminary results and benefits of DBO data array

- DBO concept can work: 4-6 cruises by 3-4 nations in 2010 and 2011
- Repeat hydography is successfully capturing seasonal variation of the Pacific Water; potential to sort out seasonal vs. interannual variation a goal
- Immediate data sharing advantageous
- Information can help interpretation of individual studies by providing a temporal context
- DBO: High resolution measurements, both vertically and horizontally
- Provides essential Information of 0-30m region not captured by moorings
- Lower trophic taxa data (phytoplankton, zooplankton and benthos) shared amongst DBO cruises can be analyzed first-order via simple cluster analysis
- DBO can be used to look at temporal variation in biological parameters, latitudinal variation (time and space scales)
- variation between labs
- averaged volume transport through the Barrow Canyon is 1.3 Sv (1.0-1.7 Sv)
- Seasonal variation of heat content and heat flux is large
- Fresh water flux from July to September (3 months) is 800 km^3
- Moorings: also important for seasonal variation (including winter), Long term monitoring
- Satellites needed for overview of whole Chukchi Sea

Challenges

- Requires coordination and commitment
- Need for spatial resolution of water sample variables (ideally more nutrients than just nitrate)
- Recognition that different sampling scales are needed for physics, hydrography, plankton and benthic sampling
- Data quality and processing time are issues
- Need more post-cruise analysis sorting time for biological data
- Standardization of gear and analytical capability
- Dollection of standard parameters sites on a regular basis
- Dedicated national funding for incremental shiptime, data processing and analysis