**2012 Seacat Data Documentation Form**

**Data submission to NOAA/PMEL**

**Date: 5/13/13**

**Section 1. Contributor Identification**

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| 1. Name of contributor  Lauri Sadorus | 5. Telephone  206-634-1838 x7677 |
| 2. Organization name  International Pacific Halibut Commission | 6. Email  lauri@iphc.int |
| 3. Mailing address  2320 West Commodore Way, Suite 300 | 7. Fax  206-632-2983 |
| 4. City, State, Zip, Country/Province  Seattle, WA, 98199-1287 | 8. Alternate contact name and phone  Michael Larsen 206-634-1838 x7671 |

**Section 2. General Dataset Description**

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| 1. Dataset Title: IPHC Oceanographic dataset | |
| 2. Dataset Abstract: The IPHC conducts an annual longline fish survey on a 10x10 nautical mile grid from southern Oregon north to the Gulf of Alaska, out along the Aleutian Island chain, and into the Bering Sea in depths ranging from 30 to 500 m. Beginning in 2000, the IPHC conducted a pilot project looking at the practicality of collecting oceanographic profile data alongside fishery data at the longline survey stations. The project was expanded to stations off Oregon in 2007 and coast-wide starting in 2009. Profiles were taken at each station immediately prior to hauling the longline gear so that oceanographic data collection is coincident with the haul. The data collected are surface to depth profiles of pressure (depth), temperature, conductivity (salinity), dissolved oxygen, pH, and chlorophyll *a* concentration. | |
| 3. Dataset purpose/general description: Surface to depth profiles are collected at each of about 1200 longline fishing stations in the IPHC survey. The geographic range of the survey allows the IPHC to take an oceanographic “snapshot” each summer of conditions along the continental shelf in the north Pacific and parts of the Bering Sea that will likely be useful to researchers worldwide as the time series builds. Furthermore, collecting these data coincident with longline survey fishing enables stock assessment scientists to examine the role of oceanographic conditions in relation to distributions of commercially caught groundfish. | |
| 4. Dataset collection dates  First day of data collection: 5/31/12  Last day of data collection: 6/22/12 | |
| 5. Dataset location  Northernmost latitude: 56o40.01  Southernmost latitude: 54o28.85  Easternmost longitude: 165o23.21  Westernmost longitude: 170o42.20  IPHC Survey region: 4A Edge (4AE) | 9. Vessel name and type  F/V Kema Sue (abbreviation: KSU)  80’ longline fishing vessel |

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| 6. Instruments used to collect these data:  We use SBE19plus and SBE19plusV2 water column profilers made by Seabird Electronics Inc. in Bellevue, WA, outfitted with auxiliary sensors to measure dissolve oxygen (SBE43), pH(SBE18), and chlorophyll a concentration (WETLabs – ECO-FLRTD). In 2012, some profiler assemblies were equipped with Star-Oddi temperature/depth loggers. | 10. Trip/cruise number  Trips 1, 3, 5 |
| 7. Parameters measured  Pressure, temperature, conductivity (salinity calculated), dissolved oxygen, pH, chlorophyll *a* concentration | 11. Station number range  7001-7046, 9502-9510 |
| 8. Number and type of files/casts transferred  33 total casts – each cast provided in NetCDF and text formats. | 12. Description of file names  NetCDF and text filenames have prefix: IPHC2012 (Organization and year), 3-letter Vessel (see Section 2.9), 4-digit Area/station, cast (set) number cNNN (c and three digits).  Suffix is .nc or .txt |

**Section 3. Scientific Content of Dataset**

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| Name of measured parameter | Unit of measure used for parameter | Observation method and instrument used | Data processing techniques |
| Pressure  Temperature  Salinity  Dissolved O2  pH  Chlorophyll *a*  Sigma-T  oxygen | Strain gauge (db)  ITS-90 oC  psu  ml/L  pH  µg/l  kg/m3  % saturation | SBE19plusV2  SBE19plusV2  SBE19plusV2  SBE43  SBE18  Wetlabs ECO-FL(RT)D (fluorometer, real-time, 6000-m rating)  calculated value  calculated value | All data are processed from raw using SeaBird “SEASOFT SBE Data Processing” software, and  a configuration (\*.con) file that includes integrated instrument serial numbers and calibration coefficients. Data are averaged to 1-meter from downcast, with occasional upcast fill if problems. Salinity is calculated from conductivity, temperature and pressure using the 1978 Practical Salinity Scale (PSS, IEEE Journal of Oceanic Engineering, V. OE-5, No.1, Jan.1980, p.14). Calculated values (2): sigma-T (density-1000) and % Oxygen concentration. |

\*Star Oddi depth Bottom depth in meters as measured by temperature/depth loggers attached to the anchor of the profiler. Not all vessels in 2012 have Star Oddi measurements.

CSF depth Bottom depth in meters as measured by vessel instruments or other means and are of variable accuracy. Use for rough estimation only.

**Section 4. File Format of Dataset**

Each station has one profile (cast/set) presented in two formats text (txt) and NetCDF (nc). All times are GMT. NetCDF files have axes (longitude, latitude, depth, time), and attributes. Text files have a ~40-line header, and the final header line lists data columns.

Latitude: North latitude 0-90° in decimal degrees, and labeled “degree\_north” (NetCDF) or

“degrees north” (txt files)

Longitude in txt files: positive decimal degrees from 0-360° and labeled “degrees east”

Longitude in NetCDF files: positive decimal degrees from 0-180°, labeled “degree\_west” or “degree\_east”

CRUISE: IPHC vessel code (3-letter) and region abbreviation (3-letter) (see Sec.6)

CAST: IPHC set number, defines one data profile (cast) at one location

STATION\_NAME: 4-digit IPHC survey station (area) number

DATA\_CMNT: lists data source CNV file name

WATER\_DEPTH: Where noted Star Oddi miniature CTD is used for bottom depth value. Otherwise bottom depth is measured by vessel instruments or estimated, and are useful only as rough estimates of bottom depth.

Data columns described in the header information are as follows:

Column 1: pressure (dbar)

Column 2: temperature (oC)

Column 3: dissolved oxygen (ml/L)

Column 4: pH

Column 5: chlorophyll a concentration (µg/L)

Column 6: Salinity (psu)

Column 7: oxygen (µmol/kg)

Column 8: oxygen (% saturation)

Column 9: Sigma-T (kg/m3 Calculated)

Data files include all downcast data, with occasional upcast information filling in if data problems occur in downcast.

**Section 5. Instrument Calibration**

Configuration files for each profiler used are included: 6187\_12.xmlcon, 6198\_12.xmlcon

Water samples necessary for calibration of variables cannot be taken in this type of data-collection circumstance. In more usual cases, bottle samples are collected, and slope and offset calibration values are applied to profile data, including salinity and oxygen.  Lacking water samples, Winkler titrations were not performed and oxygen data are not calibrated, though SeaBird SBE-43 (dissolved oxygen) sensors are considered very reliable. For low values of oxygen concentration, calibration values are generally small, and larger for higher values.  Oxygen concentrations greater than 100% (supersaturation) are not unusual.  This can be due to variations in temperature and salinity due to heating rates and ventilation of the water column, wind and turbulence at the surface, and biological influences (photosynthesis).  Oxygen data should be used with the consideration that water samples were not collected and corrections have not been applied.  Data are indicative of variations in spatial patterns, but are not exact.

Chlorophyll-*a* data values < 0 have been retained. The values are within reasonable range of the instrument, and we attribute below-zero values to factory calibration use of generalized standards. Water samples were not collected for calibration.

There were no at-sea calibrations for pH.

**Section 6. Other**

GIS generated map is included to illustrate distribution of stations.