

Please provide the following information, and submit to the NOAA DM Plan Repository.

Reference to Master DM Plan (if applicable)

As stated in Section IV, Requirement 1.3, DM Plans may be hierarchical. If this DM Plan inherits provisions from a higher-level DM Plan already submitted to the Repository, then this more-specific Plan only needs to provide information that differs from what was provided in the Master DM Plan.

URL of higher-level DM Plan (if any) as submitted to DM Plan Repository:

1. General Description of Data to be Managed

1.1. Name of the Data, data collection Project, or data-producing Program:

AFSC/RACE/GAP/McConnaughey: Pribilof Hydro-2009-From Archiver-Shell Hash
Multibeam Bathymetry Survey - 8m resolution

1.2. Summary description of the data:

The "add on" project area surveyed depths between the 27 and 175 meter depths around St. George Island and St Paul Island in the Central Bering Sea. Full bottom coverage, consisting of 100% multibeam data was achieved within the limits of hydrography for this survey. One hundred percent backscatter data was acquired and stored by TerraSond, Ltd to be processed by the client. The data were collected from the R/V Mount Mitchell by Terrasond, Inc using a Simrad EM710 multibeam echosounder.

1.3. Is this a one-time data collection, or an ongoing series of measurements?

One-time data collection

1.4. Actual or planned temporal coverage of the data:

2009-06-03 to 2009-06-21

1.5. Actual or planned geographic coverage of the data:

W: -170.090307, E: -168.9595, N: 57.302917, S: 56.305312

1.6. Type(s) of data:

(e.g., digital numeric data, imagery, photographs, video, audio, database, tabular data, etc.)
Map (digital)

1.7. Data collection method(s):

(e.g., satellite, airplane, unmanned aerial system, radar, weather station, moored buoy, research vessel, autonomous underwater vehicle, animal tagging, manual surveys, enforcement activities, numerical model, etc.)

1.8. If data are from a NOAA Observing System of Record, indicate name of system:

1.8.1. If data are from another observing system, please specify:

2. Point of Contact for this Data Management Plan (author or maintainer)**2.1. Name:**

Steve Intelmann

2.2. Title:

Metadata Contact

2.3. Affiliation or facility:**2.4. E-mail address:**

steve.intelmann@noaa.gov

2.5. Phone number:

(206) 526-4157

3. Responsible Party for Data Management

Program Managers, or their designee, shall be responsible for assuring the proper management of the data produced by their Program. Please indicate the responsible party below.

3.1. Name:

Bob McConnaughey

3.2. Title:

Data Steward

4. Resources

Programs must identify resources within their own budget for managing the data they produce.

4.1. Have resources for management of these data been identified?

No

4.2. Approximate percentage of the budget for these data devoted to data management (specify percentage or "unknown"):

Unknown

5. Data Lineage and Quality

NOAA has issued Information Quality Guidelines for ensuring and maximizing the quality, objectivity, utility, and integrity of information which it disseminates.

5.1. Processing workflow of the data from collection or acquisition to making it publicly accessible

(describe or provide URL of description):

Process Steps:

- 2009-06-03 00:00:00 - Multibeam bathymetry and backscatter data collection was performed using Kongsberg SIS data acquisition software. The file naming

convention was inherent to SIS and ensured that individual survey lines had unique names based on time of collection. SIS software generated *.all files which in addition to bathymetry and backscatter, contained positional and attitude information, both surface and full profile sound velocity, and vessel offset and alignment calibration values. All raw data files were stored on the acquisition computer's hard drive for the duration of the survey. Multibeam bathymetry data were also logged by QPS QINSy acquisition software for the EM 710. These files included navigation, attitude, and heading data from the Pos MV as well as the secondary positioning data from the CNAV. The POS M/V was set up to log Pos Pac data for both PPK and true heave to use in post processing if deemed necessary. SVP data were acquired with Sippican WinMark 21 Sound velocity profiler software as binary .rdf files and exported in ascii .edf file format. The raw files from XCTD probes were further edited into a format compatible with TerraSond Ltd. Simple SVP conversion software. Sound velocity files were then converted to CARIS format with Simple SVP formatting software. CARIS .svp files were stored in the SVP folder in the CARIS folder structure. Sound velocity profiles were further converted into .asvp format for real-time use in Kongsberg SIS acquisition software. Chronological logs containing information specific to each line were maintained as an independent reference to aid in data integration and error tracking. Acquisition logs included the line name, start and end times, ping rate, range and power settings for each sonar, in each acquisition software. Acquisition logs included any additional comments deemed significant by the operator.

- 2009-06-03 00:00:00 - Preliminary multibeam data processing was completed aboard the survey vessel. Following the initial file conversion and backup, predicted tide data were loaded and each line was merged with the sounding data in CARIS HIPS. Navigation, Heave, Pitch, and Roll were already applied and accounted for by the Simrad beam steering algorithms, but were examined for errors in CARIS HIPS. The data were then cleaned using CARIS HIPS and SIPS subset editor and a multi-resolution BASE Surface was created to verify coverage and provide quality control feedback to the survey crew.

- 2009-06-03 00:00:00 - Shipboard data handling proceeded as follows: As multibeam data collection was conducted, Kongsberg SIS Acquisition software split the raw .all files into thirty minute (30 min) segments. Each segment was then organized by Julian day, and placed onto the network data storage device. The .all files are then converted into CARIS HIPS multibeam data processing format and then saved into the CARIS directory. Ultimately the project data reside on a networked attached storage (NAS) device in a directory identifying the project name, vessel name, and Julian date. All acquisition data (both raw and processed) resided on a NAS unit with a redundancy level of RAID 5. The NAS unit itself was independently backed-up twice daily onto an independent mirrored storage device. The 2 tiered levels of back-ups insured data security and the ability of the system to resist catastrophic equipment failure.

- 2009-06-20 00:00:00 - After inspecting the navigation and attitude data, the tide corrected data were merged with the navigation and attitude data. This initial

merging step was conducted with an incomplete vessel configuration file featuring preliminary patch calibration, and sensor offset values. The merging process converted time-domain data into spatial-domain, geographically referenced soundings, and enabled the area based data editing process.

- 2009-06-20 00:00:00 - Following the merging process, area-based editing processes in CARIS HIPS Subset Editor was performed during the office review of survey soundings. During subset editing, the operator was presented with two and three-dimensional views of the soundings and a moveable bounding box to restrict the number of soundings being reviewed. Soundings were viewed from the south (looking north), from the west (looking east) and in plan view (looking down). These perspectives, as well as controlling the size and position of the bounding box, allowed the operator to compare lines, view features from different angles, measure features, query soundings and change sounding status flags. Soundings were also examined in the three-dimensional window as points, wire frame or a surface which could be rotated on any plane. Vertical exaggeration was increased as required to amplify trends or features. Soundings were flagged as accepted, rejected, designated, outstanding or examined. In the first phase of area editing, processors examined the entire survey area in CARIS HIPS Subset Editor and rejected outlying soundings unsupported by data from adjacent survey lines. Simultaneously, the data were scrutinized for any potential tide and sound velocity issues that would require further investigation.

- 2009-06-20 00:00:00 - TerraSond, Ltd. incorporates a systematic, rigorous approach to the editing and development of survey data received from the field. This ensures the maintenance of data integrity throughout the editing process. CARIS HIPS software was used to create a folder structure organized by project, vessel, and Julian day to store data. Multibeam raw data were imported into CARIS HIPS using the CARIS conversion wizard module. The wizard was used to create a directory for each line and separate the *.all files into sub-files which contained individual sensor information. All data entries were time-referenced using the time associated with the *.all file to relate the navigation, azimuth, heave, pitch, roll and slant range depths sensor files. CARIS HIPS was used for the majority of the processing and adjustments made during sounding reduction. CARIS HIPS does not allow raw data manipulation during processing. All raw data is maintained in the original, unmodified, format to ensure data integrity. TerraSond, Ltd. uses well defined procedures during the sounding reduction process and all actions are tracked to ensure that no steps are omitted or performed out of sequence. Survey lines were initially opened in the HIPS line editor mode by selecting the project, vessel, day and desired line. Preliminary soundings were tide adjusted using predicted tide data from the National Water Level Observation Network (NWLON) station at Village Cove, St. Paul, AK (946- 4212) through June 25th, 2009. No range, amplitude, or zoning schemes were applied. Refer to Section C. Corrections to Echo Soundings, of this report, for detailed information concerning final sounding reduction. Attitude data were viewed in the CARIS Attitude Editor which displayed simultaneous graphical representation of all attitude data using a common x-axis

scaled by time. The Attitude Editor, like the Navigation Editor, was used to query the data and reject erroneous values. Navigation data were reviewed using the CARIS Navigation Editor. The review consisted of a visual inspection of plotted fixes noting any gaps in the data or unusual jumps in vessel position. Discrepancies were rare and were handled on a case-by-case basis. Unusable data were rejected with interpolation using a loose Bezier curve. Data were queried for time, position, delta time, speed, and status and, if necessary, the status of the data was changed from accepted to rejected.

- 2009-06-20 00:00:00 - The finalized BASE surface exported in CARIS incorporated uncertainty values derived from Total Propagated Error (TPE). CARIS HIPS TPE calculation assigned a horizontal and depth error estimate to each sounding. TPE values represent, at a 95% confidence level, the difference between computed horizontal and vertical sounding positions and their true position values. CARIS HIPS computed TPE error values by aggregating individual error sources such as navigation, gyro (heading), heave, pitch, roll, tide, latency, sensor offsets and individual sonar model characteristics. Stored in the HIPS Vessel File, these error sources were obtained from manufacturers during the instrument calibration process, determined during the vessel survey (sensor offsets) or while running operational tests (patch test, settlement and squat).

- 2009-06-20 00:00:00 - Several finalized values were applied to the data in the final processing steps in CARIS HIPS. A verified tide file was downloaded and applied to the survey area prior to the final merge. Additionally, the locations and times of sound velocity profiles were displayed graphically to ensure that time-appropriate profiles were applied to the entire survey, each SV cast was additionally inspected for data quality. CARIS HIPS presented the option to remove the original SV values and use the CARIS SV correction algorithms. This step was employed during the final merge, ensuring consistent application of SV files to the entire dataset. Sound Velocity casts were applied based on the Previous in Time method of CARIS HIPS. Static draft observations were entered in the vessel configuration file. The measure down value used to calculate this value varied 3cm between the beginning and the end of the survey therefore for simplicity; a single value was used for static draft based on the initial measure down value. The 3cm maximum potential error accrued from the application of a single static draft value is well within the error budget of this survey. Dynamic draft values were calculated and entered in the HIPS vessel configuration file. CARIS HIPS uses dynamic draft tables based on vessel speed and not propeller pitch as was the controlled variable on-board the Mitchell. Average vessel speed was computed for the range of propeller pitches. The final processing step before TPE calculation and data export was a final merging of all data. This merge resulted in the final geographical positions of each sounding relative (horizontally) to the NAD83 ellipsoid, projected in UTM Zone 2N (m) and vertically to the Mean Lower Low Water level datum established for Village Cove, St. Paul, AK.

5.1.1. If data at different stages of the workflow, or products derived from these

data, are subject to a separate data management plan, provide reference to other plan:

5.2. Quality control procedures employed (describe or provide URL of description):

see Process steps

6. Data Documentation

The EDMC Data Documentation Procedural Directive requires that NOAA data be well documented, specifies the use of ISO 19115 and related standards for documentation of new data, and provides links to resources and tools for metadata creation and validation.

6.1. Does metadata comply with EDMC Data Documentation directive?

No

6.1.1. If metadata are non-existent or non-compliant, please explain:

Missing/invalid information:

- 1.7. Data collection method(s)

6.2. Name of organization or facility providing metadata hosting:

NMFS Office of Science and Technology

6.2.1. If service is needed for metadata hosting, please indicate:

6.3. URL of metadata folder or data catalog, if known:

<https://www.fisheries.noaa.gov/inport/item/28076>

6.4. Process for producing and maintaining metadata

(describe or provide URL of description):

Metadata produced and maintained in accordance with the NOAA Data Documentation Procedural Directive: https://nosc.noaa.gov/EDMC/DAARWG/docs/EDMC_PD-Data_Documentation_v1.pdf

7. Data Access

NAO 212-15 states that access to environmental data may only be restricted when distribution is explicitly limited by law, regulation, policy (such as those applicable to personally identifiable information or protected critical infrastructure information or proprietary trade information) or by security requirements. The EDMC Data Access Procedural Directive contains specific guidance, recommends the use of open-standard, interoperable, non-proprietary web services, provides information about resources and tools to enable data access, and includes a Waiver to be submitted to justify any approach other than full, unrestricted public access.

7.1. Do these data comply with the Data Access directive?

No

7.1.1. If the data are not to be made available to the public at all, or with limitations, has a Waiver (Appendix A of Data Access directive) been filed?

Yes

7.1.2. If there are limitations to public data access, describe how data are protected from unauthorized access or disclosure:

None

7.2. Name of organization of facility providing data access:

Alaska Fisheries Science Center (AFSC)

7.2.1. If data hosting service is needed, please indicate:

Yes

7.2.2. URL of data access service, if known:

<https://www.ncei.noaa.gov>

7.3. Data access methods or services offered:

unknown

7.4. Approximate delay between data collection and dissemination:

Unknown

7.4.1. If delay is longer than latency of automated processing, indicate under what authority data access is delayed:

No delay

8. Data Preservation and Protection

The NOAA Procedure for Scientific Records Appraisal and Archive Approval describes how to identify, appraise and decide what scientific records are to be preserved in a NOAA archive.

8.1. Actual or planned long-term data archive location:

(Specify NCEI-MD, NCEI-CO, NCEI-NC, NCEI-MS, World Data Center (WDC) facility, Other, To Be Determined, Unable to Archive, or No Archiving Intended)

NCEI_MD

8.1.1. If World Data Center or Other, specify:

8.1.2. If To Be Determined, Unable to Archive or No Archiving Intended, explain:

8.2. Data storage facility prior to being sent to an archive facility (if any):

Alaska Fisheries Science Center - Seattle, WA

8.3. Approximate delay between data collection and submission to an archive facility:

unknown

8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?

Discuss data back-up, disaster recovery/contingency planning, and off-site data storage

relevant to the data collection

IT Security and Contingency Plan for the system establishes procedures and applies to the functions, operations, and resources necessary to recover and restore data as hosted in the Western Regional Support Center in Seattle, Washington, following a disruption.

9. Additional Line Office or Staff Office Questions

Line and Staff Offices may extend this template by inserting additional questions in this section.