Data Management Plan: High Frequency Radar (HFR)

I. Type of data and information created

What data will you collect or create in the research?
Contextual statement describing what data are collected and relevant URL (IOOS Certification, f 1. ii)
High Frequency (HF) Radar ocean surface backscatter (sorted by range) "Range Series"
High Frequency (HF) Radar measured ocean surface radial velocities "Radial Velocities"
High Frequency (HF) Radar derived total vector velocities "near real-time total vectors (RTVs)" via High Frequency Radar Network (HFRNet)

What data types will you be creating or capturing?

Range Series -	binary files
Radial Velocities -	ascii or binary files
RTVs -	NetCDF files via HFRNet

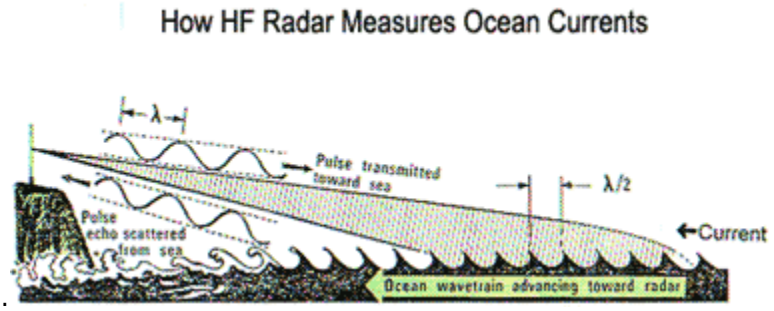
How will you capture or create the data?
Describe how the data are ingested (IOOS Certification, f 2.)

Range Series – acquired at a high frequency radar site on an onsite computer and stored locally.

Radial Velocities - processed at an onsite computer for each site location and then sent via network to a site aggregator/portal system. The site aggregator/portal system then sends radial velocities via the network to a node for total vector processing.
(Refer to: https://cordc.ucsd.edu/projects/mapping/documents/HFRNet_Portal_RefGuide.pdf)

RTVs - processed on a node system via HFRNet.
https://cordc.ucsd.edu/projects/mapping/documents/HFRNet_Node_RefGuide.pdf

general overview



- **Range Series** - Doppler Radar sends radio waves in the 10 to 50MHz band and listens to the scattered signal from the surface waves that have wavelengths in the 15 to 3m range
- **Radial Velocities -** System directly measures the speed of the waves that scatter the radar signal. Differences between the measured speed and the known speed of the waves are the ocean surface currents
- **RTVs** – The resulting ocean surface radial velocities are combined with radial velocities collected by neighboring sites with overlapping coverage to produce near real-time total velocities.

Describe how data are managed (IOOS Certification, f 2.)
Describe the data quality control procedures that have been applied to the data. (IOOS Certification, f 3.)

If you will be using existing data, state that fact and include where you got it.
What is the relationship between the data you are collecting and the existing data?
N/A

II. Expected schedule for data sharing

Adheres to the NOAA Data Sharing Procedural Directive. The System is an operational system; therefore the RICE should strive to provide as much data as possible, in real-time or near real-time, to support the operation of the System. (IOOS Certification, f. 4.)

How long will the original data collector/creator/principal investigator retain the right to use the data before opening it up to wider use?

Range Series – data are archived locally by HF radar operator shared by request.
Radial Velocities - data are sent in near real-time to the HF Radar Network (HFRNet). Radial velocities are shared within the network hourly (approximately).
RTVs - Data are distributed in near real-time via HFRNet. RTVs are shared approximately within 3 hours.

How long do you expect to keep the data private before making it available? Explain if different data products will become available on different schedules (Ex: raw data vs processed data, observations vs models, etc.)

(N/A) These data are not private.
Range Series – upon request.
Radial Velocities – upon request until archiving at the National Oceanographic Data Center is complete (tbd).
RTVs – Available approximately within 3 hours from real-time.

Explain details of any embargo periods for political/commercial/patent reasons? When will you make the data available?

(N/A) These data are not private.

III. Standards for format and content

Which file formats will you use for your data, and why?
How can the information be accessed? (IOOS Certification, f 1. ii)

Range Series – binary because they vendor specific to the acquisition software.
1.) Codar Ocean Sensors – SeaSonde: Refer to: http://support.codar.com/ >Manuals & Documentation >Guides to File Formats > File_RangeSeries.pdf
2.) WEllen RAdar (WERA): (Refer to: http://www.helzel.com/de/9293-wera-service
3.) Least Expensive RAdar (LERA):

Radial Velocities – asci or binary files because they vendor specific to the processing software
1.) Refer to: http://support.codar.com/ >Manuals & Documentation >Guides to File Formats > File_LonLatUV_RDL_TOT_ELP.pdf
2.) Refer to: http://www.helzel.com/de/9293-wera-service
3.) Least Expensive RAdar (LERA):

RTVs –NetCDF because the format is widely used within the oceanography community, the format for compression, and there are publicly available tools for distribution
(Refer to: https://cordc.ucsd.edu/projects/mapping/documents/HFRNet_RTV-NetCDF.pdf)

What file formats will be used for data sharing?
Numeric Data

- THREDDS Data Server provides full access to combined vector data. The TDS provides OPeNDAP, WCS, NetCDF subsetting, and WMS access. Please note that because this service holds the full data series, load times may be slower than normal.
- Rolling FTP access provides recent NetCDF output for easy access. The time window is narrow. For older data, we recommend using out THREDDS server.
- Shapefiles provide numeric data in a format digestible by many visualization software packages.

Visual Data
We provide these files as an easy means of bringing in HF RADAR data to other applications. These methods do not contain numeric data, and are therefore of limited use in scientific applications.

- KML Recent RTVs displays the most recent 7 days of combined total vectors. The KML is divided into folders for hourly and 25hr averaged processing. It is further divided into sub-directories for each of the data resolutions available.
- KML Station Status is a simple KML file that contains Placemarks and basic metadata for each of the installed HF RADAR sites.
- Embeddable mapping API. You can use this API to embed the total vector maps into your website, allowing you to create custom, rich applications with the ability to add your own layers.

Data are accessible in a variety of formats: Google Earth KML (7 days), mapping HPI (For off-site maps), CORDC THREDDS server, NDBC THREDDS server, FTP (3 day rolling archive),

shapefile access (California) via FTP (3 day rolling archive), shapefile access (Gulf Coast) via FTP (3 day rolling archive).

What metadata/ documentation will be submitted alongside the data or created on deposit/ transformation in order to make the data reusable?

What contextual details (metadata) are needed to make the data you capture or collect meaningful?

How will you create or capture these details?

What form will the metadata describing/documenting your data take?

Which metadata standards will you use and why have you chosen them? (e.g. accepted domain-local standards, widespread usage)

IV. Polices for stewardship and preservation

What is the long-term strategy for maintaining, curating and archiving the data?
Points of contact- Individuals responsible for the data management and coordination across the region (CV's attached); (IOOS Certification f 1. i)
Julie Thomas - Employee 38 years, Principal Investigator/Program Manager
858-534-3034
jothomas@ucsd.edu

Darren Wright - Employee 10 years, Programmer/Analyst
858-534-3032
darren@ucsd.edu

Jen McWhorter - Employee 1 year, Administrative Analyst
858-534-3032
jen@cdip.ucsd.edu

http://cordc.ucsd.edu/projects/mapping/documents/SCCOOS-BestPractices.pdf
Near real time data telemetry has been done over FTP and managed by a custom Perl script run through cron on the remote site. The script determines which files need to be sent by comparing files available in the recent radial directory, normally /Codar/SeaSonde/Data/Radials, with a log of files that have already been successfully sent to the FTP server. Various other options are available for accomplishing this task including rsync over SSH. The HFR_Progs toolbox developed at the Naval Postgraduate School in Monterey, CA and the University of California at Santa Cruz may offer additional options and capabilities for this task. SIO has phased out its use of its custom Perl scripts used for data telemetry from remote sites in favor of the Antelope solution developed for the National Network. The Antelope solution requires no code installation at the remote site. The only requirements are access over SSH and the presence of a single static path for recent radial files (see also section 3). Instead of posting data to an FTP server, Antelope stores data to an observer which is capable of serving data to the entire HF-Radar Network in real-time. Additional information on Antelope solution for data telemetry is available in 'Data Management and Real-time Distribution in the HF-Radar National Network', Terrill et. al., IEEE OCEANS06 (available through www.rowg.org). Further integration between Antelope managed data telemetry and CODAR central site processing is being carried out in collaboration with San Francisco State University. 5.3 Local Data Management/Backups

Identify the procedures used to evaluate the capability of the individual (s) identified in subsection 997.23(f)(1) to conduct the assigned duties responsibly. (IOOS Certification, f 1. iii)
The University of California has a process in place for personnel evaluation. These evaluations are on file with UC San Diego Human Resources.. All personnel listed have received excellent evaluations.

Which archive/repository/database have you identified as a place to deposit data?
Documents of the RICE's data archiving process or describes how the RICE intends to archive data at the national archive center (e.g., NODC, NGDC, NCDC) in a manner that follows guidelines outlined by that center. Documentation shall be in the form of a Submission

Agreement, Submission Information Form (SIF) or other, similar data producer-archive agreement (IOOS Certification, f 6.).

What procedures does your intended long-term data storage facility have in place for preservation and backup?

How long will/should data be kept beyond the life of the project?
Data are indefinitely stored.

What data will be preserved for the long-term?
All data is made available and preserved.

What transformations will be necessary to prepare data for preservation / data sharing?

What metadata/ documentation will be submitted alongside the data or created on deposit/ transformation in order to make the data reusable?

What related information will be deposited?

V. Procedures for providing access

What are your plans for providing access to your data? (on your website, available via ftp download, via e-mail, or another way)
Describe how data are distributed including a description of the flow of data through the RICE data assembly center from the source to the public dissemination/access mechanism. (IOOS Certification, f. 2.)

Will any permission restrictions need to be placed on the data?

With whom will you share the data, and under what conditions?
Data are publically available.

Will a data sharing agreement be required?

Are there ethical and privacy issues? If so, how will these be resolved?
N/A

Who will hold the intellectual property rights to the data and how might this affect data access?
The funding agency & the University of California, San Diego through a contractual agreement.

VI. Previous published data

If you have previously published research data, list the citations here (including the website or persistent identifier).

Contact us at hfrnetadm @ ucsd.edu