Environmental Studies Program: Ongoing Studies

Study Area(s): National

Administered By: Headquarters

Title: Phase II Development of the Tethys PAM Metadata System (NT-16-06)

BOEM Information Need(s) to be Addressed: The hardware and data processing / data analyzing used in passive acoustic monitoring (PAM) of the marine environment has matured greatly in recent decades. PAM is now serving as an important research tool and method of monitoring the marine environment for baseline determinations and assessing environmental impacts. As such, there is a need to standardize the documentation of and access to acquired PAM data for BOEM's various environmental protection responsibilities such as compliance with the MMPA and the ESA and to assess possible adverse impacts due to seismic surveying and pile driving. This study will help in these matters by greatly enhance the accessibility and usefulness of PAM data from many research and governmental monitoring activities.

Total Cost: (in thousands) $500 **Period of Performance:** FY 2016-2018

Conducting Organization(s): San Diego State University

BOEM Contact(s): COR: James Price; DES Contact: Johnathan Blythe

Description:
Background: Tethys is a BOEM-co-funded, National-Oceanographic-Partnership-Program passive acoustic monitoring metadata database system designed to organize and store acoustic metadata (http://tethys.sdsu.edu/ ; see also Tethys (2013)) . The data schema (rules that govern how data is organized) were designed to permit representations of acoustic metadata that are comparable across long time frames by providing a consistent format. A set of schema have been developed for describing instrumentation, effort, detections and localizations. In addition to the standard reporting fields, the schema permits the addition of user-defined information, thus letting PAM practitioners define their own information.

Tethys is currently used for the management of the U. S. Navy's fleet data recorded on high frequency acoustic recording packages (HARPs) in the Cherry Point Operating Area, Jacksonville Range Complex, Southern California Offshore Range, The Northwest Range Training Complex, Gulf of Alaska Temporary Maritime Activities Area, Hawaii Range Complex, and Mariana Islands Range Complex. Tethys incorporates the expertise of PAM personnel at NOAA Alaska, Northeast, Pacific Islands, Southeast, and Southwest Fisheries Science Centers as well as PAM experts at Scripps Institution of Oceanography and San Diego State University. As an organizational level database, Tethys is designed to meet the needs of groups of users within one or several organizations.

Objectives: The objective of this study is to advance the state of development of Tethys metadata standard and accompanying Tethys user software to facilitate the generation of metadata documenting of PAM data sets in a manner that best meets the needs of the wider scientific and other PAM user communities.

Methods: : Through dialog with the PAM community (scientific and other users), including but not limited to present Tethys users, and with close cooperation with the Acoustical Society of America this study will:

1. expand or otherwise modify the data schema according to the expressed needs of the PAM community and with the intent of arriving at a community-wide metadata standard;

2. enhance the client libraries to provide additional data analysis and reporting facilities;

3. identify bottlenecks in performance as the existing databases continue to grow in size (Code will be restructured to ensure smooth operation as we move to larger data sets.);

4. test and refine the interface using localization data collected by newly installed localizing HARPs in the Southern California Range Complex, from other U. S. Navy projects, and any other large data collection efforts that can be utilized; and

5. develop role-based security administration (e. g. contributor that can submit data or revisions, analyst that query data, administrator with privileges to remove data, etc.) for implementation when Tethys runs in secure-server mode.

Current Status: The data schema and client libraries have been upgraded as per community requests. Processing bottlenecks have been identified and overcome with a modest revision of some of the Tethys' algorithms. A refined interface and security provisions were completed in 2017 along with more testing by selected members of the user community. BOEM will beta-test this system in 2018.

Final Report Due: November 10, 2018

Publications Completed: (none so far)

Affiliated WWW Sites: http://tethys.sdsu.edu/

Revised Date: February 12, 2018