Climate Change Adaptation Research Grants Program
- Marine Biodiversity and Resources Projects

Project title:
Ensuring that the Australian Oyster Industry adapts to a changing climate: a natural resource and industry spatial information portal for knowledge action and informed adaptation frameworks.

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Objectives:

1. To source and review spatially referenced data for relevance to the oyster industry and it's response to natural resource management and climate change, and align primary and meta-data standards.
2. To engage the oyster industry in developing the content style and delivery of natural resource and industry information in an online portal, including industry sourced data from Quality Assurance Programs and Environmental Management Strategies.
3. To deliver a pilot, online, spatially-referenced, natural resource and industry information portal, making use of extensive primary data sources, meta-data standards and national spatial data delivery initiatives.
4. Identify pathways for the spatial information portal to inform governance and statutory authorities (e.g. NRM, State and LGA), monitoring programs, strategies (e.g. oyster industry and NRM strategies), planning policies (e.g. development application processes).

Methods:
This proposal will achieve the final outcome of delivering an online, proof-of-concept, spatial information portal for natural resources relevant to the oyster industry. It will develop the portal through staged sourcing of primary data, data standardisation and alignment, aligning meta-data protocols for data custodians, design the data repository network and deliver a portal framework though existing spatial data infrastructure initiatives. In addition, the methods describe how a national spatial information portal for the oyster industry can evolve from this NSW proof-of –concept proposal. Finally, the legal issues involved in establishing a data portal and the use of this information to inform government industry and natural resource strategies and policies will be addressed.

Initial DECCW, NRM and Local government meetings will provide data access and delivery methods, as well as provide a synthesis of existing initiatives and progress towards national standards and spatial referencing. It will also identify the needs for potential workshops with representatives of national environmental data standardisation initiatives such as the Office of Spatial Data management, National Plan for Environmental Information, International Marine Observatory System and the Australian Oceans Data Network. Follow up meetings with DECCW, NRM and Local government will provide for training and demonstration of the development of meta-data and delivery to identified data repositories. Flow charts for data delivery and access will be developed.

STAGE 1: Primary data: Source base map information of priority oyster catchments
Elements of a successful primary data monitoring and management strategy are already in place. For example, state and local government natural resource managers (NRM) (e.g. SRCMA (2008) and NSW DECCW (near complete)) are already committed to and collect long term environmental data (e.g. water quality data, chlorophyll production) that is spatially referenced with meta-data according to national standards. Similarly, the oyster industry already collects regular data on the presence of harmful algal blooms; data which at present is only utilised for real time closure or opening of harvest areas without considering long term patterns in the data. Industry and natural resource (seagrass beds, salt marsh and lease areas) are also mapped.

Little of this information however, is collectively available or in compatible formats to enable industry to understand current condition, track trends or identify high risk lease areas in relation to natural resources. There is not a limitation to the amount of data, natural resource information or report cards that are available and relevant to the oyster industry, but rather the framework for the collective delivery of this information is lacking (personal comment T. Roper NSW DECCW); in particular for meaningful delivery to the oyster industry. A coordinated approach to environmental data collection is not a new concept and the process is underway in many government departments and natural resource agencies, however it has been a challenge historically due to different data collection protocols, different spatial referencing systems and limited communication between data custodians. Recent efforts to standardise broad monitoring programs and data delivery implies that streamlined and collective analysis of data from different sources can now become a reality with low cost and user friendly tools.

This proposal will specifically harness the extensive sets of natural resource data from and with participating state and local government agencies that are aligned with NRM monitoring, evaluation and reporting (MER) strategies in NSW, plus other relevant data sets (see list below). Data will be assessed to select a series of priority coastal locations across 5 local government areas (below) in NSW, based on data availability and links to national and state monitoring programs, relevance to the oyster industry and priority lease areas and stakeholder interest and contributions (NRM and Local Government). The first stage of preparing data for use in the portal will be to edit it in terms of variable terminology, standard units, establish categories and attributes for spatial layers and temporal scales.

STAGE 2: Meta data and Spatial Portal Development

A most useful method for multiple stakeholders to access patterns of natural resource and industry data, is through a spatial format portal from which to visualise resources geographically and to track trends in environmental and climate change variables, as well oyster industry trends. Users will be able to seek, combine and overlay sets of spatial information that are of interest to them (e.g. lease areas and sea level rise), as well as access trends in spatially referenced environmental data (e.g. (e.g. linking changes in salinity to oyster disease, or food production patterns with oyster lease capacity). The portal concept is not new and multiple formats have demonstrated the value for other targeted applications, for example, the Australian Bureau of Meteorology (app. 200 data providers), NSW Spatial Information Exchange, South Australian Councils, Global Biodiversity Information Facility, and Google Earth applications (see list below). Now the main barriers to coordinated spatial information delivery are administrative and institutional rather than technological (comment OSDM 2010). In other words, there is no reason why we can't link oyster operations and productivity in online maps with the environmental monitoring information from local government sampling regimes to, track indicators of environmental change relevant to the oyster industry.

STAGE 3: National Adaptation Model

The research program will develop a framework that is a proof of concept for expansion into a national portal for the oyster industry, however as a proof of concept stage, will NSW data sources will be used as a first and priority case-study to test a state-wide oyster-industry adaptation resource.

This proposal has already established strong links with State and National representatives that represent the Oyster Industry nationally and locally. In particular, collaboration with Rachel King of Oyster's Australia, Bruce Zippel for South Australian Oysters and Dr. Pete Leith (TAS) through ongoing work on the NCCARF project entitled "Climate Adaptation in the Australian Edible Oyster Industry", a strategy to expand the proof-of-concept information portal will be developed.

Through this national network, ongoing consultation and workshop delivery will inform the development and structure of the spatial information framework so that following the proof of concept stage, further information can be integrated to achieve national industry representation. It is envisaged that the Oyster Industry spatial information portal will become the property and responsibility of the national and state industry representative bodies. Tasmanian and South Australian will understand the

initiative and concept from an early stage in preparation for those states develop and streamline relevant adaptation model components, and to identify where unique conditions will require adaptation of the model.

STAGE 4: Engage the oyster industry in developing the content style and delivery of natural resource and industry information in an online portal.
Early, mid progress and final workshops will be held with the oyster industry and NRM managers at the state and National levels during 2011-2012. This will consist of at least two industry meetings in each of the three states NSW, TAS and SA, as well as 2 national meetings.

STAGE 5: Integrate the spatial information portal to governance programs, strategies and planning policies

Stage 6: Deliver a user friendly spatial information portal to industry and stakeholders
A final launch, delivery and demonstration of the proof of concept natural resource and oyster industry spatial information portal will be delivered through a national and two state workshops. The format and appropriate venues for this will be determined at a later date and in consultation with Oyster Industry and NRM stakeholders.