1. Efficiently Building on Existing and Emerging State and Regional Structures to Support Coordinated Regional Data Displays, Tools, and Processes

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3. Lead Implementer: See partnerships in item 12

4. Summary
The NOAA Regional Ocean Partnership Funding Program provides the West Coast Governors' Agreement on Ocean Health an opportunity to build upon existing coastal atlas work at the state level and IOOS Regional Associations (RAs) work at the regional level to provide resources to the states and federal government to support informed ecosystem-based management and coastal and marine spatial planning (CMSP). This can be achieved by supporting the clear and coordinated display of regional data, promoting the interoperability and integration of existing ocean and coastal data sets and products, providing easy access to state and regional geographic data and metadata, providing simple data analysis tools to encourage informed stakeholder input, and establishing a process for setting regional geographic data priorities and standards. This proposal has significant collaborative potential with the West Coast Regional Data Integration Framework proposal submitted by Rumrill et al., and the MarineMap Decision-Support Tool proposal of McClintock, Steinbeck et al.

5. Estimated Funding Needed, Year 1: 700,000 **and Year 2:** 1,200,000

6. What goals and objectives would your idea advance:
- Improve the compatibility and interoperability of state coastal and marine web atlas applications and other marine and coastal spatial data on a regional (West Coast) scale
- Create an integrated, regional-scale data access portal and viewing application
- Build on the work already conducted on the West Coast to establish a process in which scientists, technical experts, coastal atlas administrators, and others work together to develop data standards, access to data, prioritization of data gaps, and data display formats for the region.

7. How do Your Goals and Objectives Relate to WCGA Priorities and/or coastal and marine spatial planning
The goal of this project is to improve the compatibility and interoperability of existing and emerging state coastal and marine web atlas applications, ocean observations and products, and data from other partners, and to leverage this resource to develop an integrated regional (West Coast) geographic data portal that will support informed ecosystem-based management and CMSP. The partnership behind this not only brings regional information systems and science-based data products, but also significant stakeholder engagement and outreach, and the ability to continuously monitor the physical and human components of the region.

8. Provide up to 5 ways you will measure success

- State coastal and marine web atlas applications and other marine and coastal spatial data applications are compatible and interoperable and have the capability to consume and display regional and federal data and metadata and allow federal applications to consume and display regional and state data and metadata
- An integrated, regional-scale data access portal and viewing application has been created which builds on and links existing applications to provide users with the ability to access and visualize regional data and metadata, provides regional maps and data summary products, and provides access to simple on-line tools for non-technical users.
- A process had been established which builds on existing work on the West Coast, in which scientists, technical experts, coastal atlas administrators, and others work together to develop data standards, access to data, prioritization of data gaps, and data display formats for the region.

9. Problem to be addressed

Clear and easy access to regional information is necessary to support CMSP, as well as other areas of focus for the WCGA. Currently, there are a number coastal and marine web atlas and data display applications which are individually serving their intended audiences but are not all compatible at a regional scale. In addition, there is no "front door" or "portal" web site to allow easy access to these existing applications and to regional data, metadata, data products (including maps), and simple data tools for nontechnical audiences.

In addition, a transparent, regionally-supported process for meeting and improving data standards, access to data, prioritization of data gaps, and data display formats for the region would be extremely valuable to CMSP efforts in the region.

10. Identified needs and the status of ongoing efforts to address them

The coastal and marine web atlas applications in Washington, Oregon, and California (in development) are intended to meet the needs of the states for coastal zone management and marine management. State coastal and marine web atlas application managers have recognized the need to coordinate regionally on data needs and data sharing and have formed a partnership of coastal and marine atlases involving state agencies, academia, non-profit organizations *and* the West Coast Integrated Ocean Observing Systems, NANOOS, CeNCOOS, and SCCOOS (see item 12) . It is agreed that the regional IOOS community, combined with the West Coast Coastal Atlas community, provides for a compelling consortium that may be unmatched. Together we make up a comprehensive set of highly experienced and capable partners who are already engaged with stakeholders and agency managers from the local to the national level (including NOAA).

Easy access to and transparency of data and information is a basic requirement for CMSP. The state coastal and marine web atlas applications on the west coast are being developed and managed for state-specific purposes but have already been moving towards increasing compatibility and collaboration. In addition, the International Coastal Atlas Network (ICAN; icoastalatlas.net) has been able to provide collaborative technical expertise to increase the ability of atlases to share and display data across applications – and state borders – to people in need of this information. The IOOS RAs are the regional component of a national IOOS, created to ensure the sustained observation of our coasts

and oceans and to develop and disseminate information products based on those observations. By partnering with the coastal atlas community on this endeavor, the West Coast RAs bring their experience in data management and integration and expertise in product development and visualizations, especially regarding spatially complex time series (3D and 4D) and near-real-time ocean information.

11. How does your idea relate to other ongoing or planned regional ocean governance efforts?

 Easy access to and transparency of data and information is a basic requirement not only for CMSP, but also for other science-based policy or planning efforts in the region.

12. Please list the partners who will help implement you idea

California	
	California Coastal Atlas, Scripps, San Diego Supercomputer Center, CaliforniaCoastalAtlas.net**,** Contact: John Helly, hellyj@ucsd.edu
	California Ocean Uses Atlas, NOAA National MPA Center, Marine Conservation Biology Institute www.mpa.gov/dataanalysis/atlas Contacts: Mimi Diorio, mimi.diorio@noaa.gov; Jordan Gass, jordan.gass@noaa.gov
	California Coastal and Marine Information System (under development) Contact: Pam Rittelmeyer, prittelmeyer@scc.ca.gov, California Ocean Protection Council
Oregon	
	Oregon Coastal Atlas, Oregon Coastal Management Program, OSU, www.coastalatlas.net Contacts: Tanya Haddad@state.or.us; Dawn Wright, dawn@dusk.geo.orst.edu
	Oregon Explorer: North Coast Explorer, OSU Libraries, Institute for Natural Resources, oregonexplorer.info/northcoast**,** Contacts: Kuuipo Walsh, kuuipo.walsh@oregonstate.edu; Lisa Gaines, lisa.gaines@oregonstate.edu
Washington	
	Washington Coastal Atlas, State of Washington Department of Ecology www.ecy.wa.gov/programs/sea/sma/atlas_home.html**,** Contact: Kathy Taylor, Kathy.Taylor@ecy.wa.gov
Alaska	
	Alaska ShoreZone, Alaska Regional Office Analytical Team, NOAA Fisheries, Coastal and Ocean Resources, Inc., Archipelago Marine Research, Ltd. ***(proposed extension of ShoreZone flights to WA, OR, CA),*** www.alaskafisheries.noaa.gov/maps**,** Contact: Mary Morris, MaryM@archipelago.ca
Regional or National (inclusive of West Coast)	
	Data Basin, Conservation Biology Institute (Corvallis, OR), databasin.org Contact: Jeremiah Osborne-Gowey, jeremiah@consbio.org
	West Coast Integrated Ocean Observing Systems NANOOS – Northwest Association of Networked Observing Systems (nanoos.org) CeNCOOS – Central and Northern California Ocean Observing System (cencoos.org) SCCOOS – Southern California Coastal Ocean Observing System (sccoos.org) Contacts: Emilio Mayorga, mayorga@apl.washington.edu, and Chris Cohen, ccohen@ucsd.edu
	MarineMap, Marine Map Consortium of UCSB, Ecotrust, The Nature Conservancy, marinemap.org**,** Contacts: Will McClintock, mcclintock@ms.ucsb.edu; Zach Ferdaña, zferdana@tnc.org

	NOAA Legislative Atlas, www.csc.noaa.gov/legislativeatlas, Contacts: Christina Cairns Christina, Cairns@noaa.gov; Dave Stein, dave.stein@noaa.gov
	NOAA Multipurpose Marine Cadastre, www.csc.noaa.gov/mbwg/htm/multipurpose.html Contacts: Christina Cairns, Christina Cairns@noaa.gov; Dave Stein, dave.stein@noaa.gov
	Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO), www.piscoweb.org/data Contacts: Kristan Milligan, millgak@science.oregonstate.edu

13. Please identify who would use the result of this idea and how they would use the results

The audience for the project will include the existing wide-ranging audience for the coastal and marine atlases and IOOS RAs. In other words, our project partners already have built in audiences who rely on atlases and ocean observation systems (e.g., local and state government agencies, independent coastal planners, resource managers, tribal governments, federal agencies, coastal and ocean scientists, ocean educators, watershed council members, non-governmental organizations, conservationists, outdoor recreation groups, real estate professionals, private citizens), including those already involved in the CMSP processes in our respective states. These entities would use the result of this idea be informed participants in CMSP and in other scientifically based decision processes on the west coast.

14. Anticipated tasks required to implement the idea (list up to 10 tasks)

- Improve the compatibility and interoperability of state coastal and marine web atlas applications and other marine and coastal spatial data on a regional (West Coast) scale.
- provide a mechanism for users to access and share this interoperable coastal and marine spatial data.
- provide integrated access to state coastal atlases, metadata, and other coastal and marine information management applications.
- display stand-alone regional products, such as regional maps, cross-state, cross-federal boundaries.
- display relevant summary information products from the West Coast Integrated Ocean Observing Systems (IOOS RAs). For example, by taking advantage of the integrated, West Coast-wide HF radar surface current mapping system, summary products could include maps of surface current trends (seasonal and annual eddies and circulation patterns), exposure maps from known point sources, or connectivity maps for larval transport. Examples of all of these products from California have already been created and integrated into MarineMap.
- provide the ability for users to download relevant data sets and associated metadata.
- provide access to simple online tools to allow non-technical users to access data in an understandable format and conduct simple analyses.
- facilitate regional discussions, research objectives, and planning processes including, but not limited to, CMSP.

- establish a process in which scientists, technical experts, coastal atlas administrators, and others work together to develop data standards, access to data, prioritization of data gaps, and data display formats for the region.
- The West Coast Integrated Ocean Observing Systems propose to work with their scientist and stakeholder networks to identify, prioritize, and develop West Coast ocean observing data summaries and products that cater to IOOS' strengths in characterizing dynamic ocean processes and handling near-real-time data. These products would feed into the proposed regional portal, giving CMSP decision-makers access to intuitive, map-based displays of complex ocean information and time series that are already being collected.

15. Technical steps (including quality assurance) needed to accomplish the tasks (list up to 10 steps)

- Increase compatibility and interoperability of existing applications in the region with each other specifically to mosaic together basic, common data sets for the entire region that cross state and federal boundaries, to adopt and implement standards for data documentation and format, to use controlled vocabularies and ontologies to register, discover, and harvest back and forth, and more.

- Increase compatibility and interoperability of existing applications in the region with national informational web applications (e.g., the Multipurpose Marine Cadastre and Legislative Atlas),

- Develop the capability of existing applications to consume and display regional and federal data and metadata

- Provide state geographic data and metadata available to be displayed in regional and federal applications.

- Include an automated updating system for data and metadata records (via web mapping services [WMS] or other means

16. Roles of Partners

- This is a highly collaborative project. The partners will work to increase compatibility across their respective applications, will participate in the regional "portal", and will work together to develop data standards, access to data, prioritization of data gaps, and data display formats for the region.

Increased compatibility among coastal and marine web atlas applications and the increased availability of regional ocean and coastal data, metadata, and tools will enhance agency and regional decision making in a coordinated and cost-effective manner. By using, expanding and integrating existing web platforms, development of the regional-scale atlas/data portal will leverage current projects, avoid redundancies, and strengthen the Regional Ocean Partnership from a technical perspective. It will enable nontechnical users to be able to view local and regional information to enhance informed stakeholder input. It will also provide a mechanism for data to be continually updated (particularly in real-time via the IOOS RAs), as well as a location from which future decision-support tools can gain access to the data.

17. Potential obstacles to achieving goals and objectives

Because this is a highly collaborative effort, there is always to possibility that there may be disagreements on technical approaches. However, the highly collaborative nature of this project is also an important strength because, as we work through technical issues together as a community, there will be broad ownership in the resulting compatibility among applications, regional data portal, and process for setting standards.

18. How end users would participate in the planning and design of a project to carry out this idea.

This collaborative partnership includes some of the end users of this regional product (state agencies, researchers) and a larger set of the end users (state agencies, decision-makers, planners, coastal communities, tribal governments, and researchers) already use the applications participating in the proposed project.

19. Anticipated data management needs and the steps to achieve appropriate data access and archiving.

The project is a proposed solution to data management needs and will result in compatibility among applications, a regional data portal, and a process for setting standards.

20. Methods to ensure meaningful participation by all partners and appropriate stakeholders.

This is a highly collaborative proposal with a distributed workload – we propose working together to bring about application compatibility in the region, a regional data portal, and a process for setting standards.

21. Benefits to users.
State agencies, decision-makers, planners, coastal communities, tribal governments, and researchers will benefit from having the ability to access information at a regional scale and from having the managers of existing and emerging applications in the region working together to achieve regional results.

22. Benefits to society as a whole.
Society will benefit from having better access to scientific information at a regional level to inform regional planning efforts and policy decisions. In addition, establishing a highly collaborative model on the west coast of for existing and emerging applications within the region to work together to achieve regional results may be useful to other regions.

23. Document the valid user requirements guiding the proposed work.
N/A

24. Describe how information or results would be delivered to users.
As described in the body of the proposal, this would be through a regional portal to be created in the proposed project.

25. Timeline of major tasks.
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26. Important intermediate products (provide up to 5 intermediate products).

27. Important final products (provide up to 5 final products).

- State coastal and marine web atlas applications and other marine and coastal spatial data application are compatible and interoperable and have the capability to consume and display regional and federal data and metadata and allow federal applications to consume and display regional and state data and metadata
- An integrated, regional-scale data access portal and viewing application has been created which builds on and links existing applications to provide users with the ability to access and visualize regional data and metadata, provides regional maps and data summary products, and provides access to simple on-line tools for non-technical users.
- Process for developing data standards, access to data, prioritization of data gaps, and data display formats for the region.

28. Key outcomes (provide up to 5 key outcomes).

- Scientific information is available and organized on a regional basis for use in CMSP and other planning process and policy decisions

- Increased communication and collaboration among the portion of the scientific and technical community in the region specializing in displaying data understandably for use in planning and policy making and making data available for use by scientists
- The products created through this project facilitate regional discussions, research objectives, and planning processes including, but not limited to, CMSP.

Project Information Template Criteria Checklist

Criteria Checklist: Please use the following checklist to indicate which of the criteria below are relevant to your idea, and to provide a brief explanation of how your idea relates to a given relevant criterion.

Applicable?	CRITERIA	Brief Description of How Idea Relates to Criterion (no more than 3 bullets)
A. WCGA Priorities		
√	1. Ensure Clean Coastal Waters and Beaches	Atlases and IOOS RAs feature maps and info on coastal water and beach quality including monitoring; includes citizen-gathered data
√	2. Protect and Restore Ocean and Coastal Habitats	Atlases feature maps and info on ocean and coastal habitats including info, guidance on restoration; IOOS RAs provide sustained time series on relevant oceanographic conditions
√	3. Promote the Effective Implementation of Ecosystem-Based Management	Atlases provide or link to EBM decision-support tools; IOOS RAs provide sustained time series on relevant oceanographic conditions
√	4. Reduce Adverse Impacts of Offshore Energy Development	Atlases integrate, overlay data layers to show possible ocean space use conflicts; IOOS RAs integrate observations on waves, currents, and monitor potential changes
√	5. Increase Ocean Awareness and Literacy Among Citizens	Atlases provide summaries, glossaries, ready-made maps, images, case studies (aka "stories") to increase awareness and literacy; IOOS RAs have active education and outreach component
√	6. Expand Ocean and Coastal Scientific Information, Research, and Monitoring	Atlases and IOOS RAs provide the actual data and info needed for research and monitoring
√	7. Foster Sustainable Economic Development in Coastal Communities	Fosters participatory mapping and decision making via coastal atlases

	B. WCGA Regional Criteria	
√	8. Project idea is —region-wide in scope. • Project includes outcomes that advance CMSP across all three states; or • Project outcomes advance CMSP in one or more West Coast states to complement similar work and outcomes achieved to date in one or more of the other West Coast states, filling a regional gap.	See the partners, co-PIs of this project idea in Item 12.
√	9. Project addresses a regionally specific conservation or socioeconomic concern(s), achieved through a collaborative or multi-stakeholder process.	
	10. Project is ecosystem-based, reflecting the following aspects where relevant: • Integrates ecological, social, and economic goals; • Recognizes humans as key components of the ecosystem; • Considers ecological boundaries while acknowledging political borders; • Assesses cumulative impacts from various sources; • Strives to balance conflicting uses; • Accounts for complexity and uncertainty of natural processes and social systems; • Incorporates adaptive policies in the face of uncertainties; • Considers multiple factors.	

Applic-able?	CRITERIA	Brief Description of How Idea Relates to Criterion (no more than 3 bullets)
√	11. Project advances CMSP capacity on the West Coast through regional planning processes or by addressing one or more of the 12 guiding principles described in the OPTF CMSP framework.	See below
√	12. Project advances CMSP capacity on the West Coast through regional planning processes or by addressing one or more of the 12 guiding principles described in the OPTF CMSP framework.	TYPO in WCGA form?? This item identical to 11.
√	13. Data generated from the project will regionally relevant and be made publicly available.	Entire project is about availability of data via portal and will aid the regional roll up of ongoing state-based CMSP planning efforts
√	14. Project outcomes demonstrate utility for either decision-support systems (data portals, e.g.) or West Coast decision-makers (resource managers, policy makers, e.g.).	Entire project is about data portal(s) *for* decision-makers and will directly assist decision support tools such as MarineMap
√	15. Project engages multiple stakeholders to define problems, incorporate scientific, social, and economic understanding, set goals, and find solutions.	Atlases and IOOS RAs exist for this purpose
C. OPTF Guiding Principles for Coastal and Marine Spatial Planning		
	16. Sustainability. Promotes sustainable ocean and coastal uses through an ecosystem-based management approach that addresses cumulative effects of those uses.	
	17. Compatibility of uses with ecosystems and among uses. Manages existing and emerging uses to reduce conflict, enhance compatibility among uses and with sustained ecosystem functions and services, provides for public access, and increases certainty and predictability for economic investments.	
√	18. Engagement. Broadly engages partners, the public, and stakeholders.	Atlases are excellent engagement tools esp because of interactive mapping; IOOS RAs bring broad group of partners and active stakeholders
√	19. Coordination. Builds upon existing marine spatial planning efforts at all scales.	Atlases and IOOS RAs provide data and maps for efforts at local, state, regional scales
	20. Clarity. States clear objectives for evaluating alternatives, tradeoffs, cumulative effects, and sustainable uses.	
√	21. Informed by knowledge. Uses the best available natural and social science and relevant local and traditional knowledge.	Knowledge is contained in the atlases and IOOS RAs in various forms

Applic-able?	CRITERIA	Brief Description of How Idea Relates to Criterion (no more than 3 bullets)
	22. Precaution. Is guided by the precautionary approach that states —Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.	
	23. Flexibility. Adapts to changing environmental conditions and impacts, new and emerging uses, advances in science and technology, and policy changes.	
	24. Evaluation. Is regularly evaluated, with public input, to ensure that desired outcomes are achieved.	
	25. Consistency with laws and policies. Is coordinated and compatible with important greater-than-regional strategies (e.g., national security energy, foreign policy, emergency response), customary international law and international agreements to which the United States is a party, and applicable federal and state laws, regulations, and executive orders.	

Applic-able?	CRITERIA	Brief Description of How Idea Relates to Criterion (no more than 3 bullets)
	D. Essential Elements of a Coastal and Marine Spatial Plan	
√	26. Identify regional objectives.	Atlases and IOOS RAs provide regional data by building on existing efforts and
√	27. Identify existing efforts that should help shape the plan.	Atlases and IOOS RAs represent existing efforts w/proven results and user communities
√	28. Consult scientists and technical and other experts.	Atlases and IOOS RAs have scientists and other experts as contributors, users, and evaluators
√	29. Analyze data, uses, services, and impacts.	Atlases exist for this purpose
√	30. Develop and evaluate alternative future spatial management scenarios and tradeoffs.	Atlases and IOOS RAs provide data, tools for this process. In addition, they provide the critical platforms needed to develop specialized evaluation tools. And they will create time and money efficiencies by saving decision-support developers such as MarineMap from having to collect data from multiple sources and at regional scales.
	31. Prepare and release for public comment a draft CMS plan with	

Applicable?	CRITERIA	Brief Description
	supporting environmental impact analysis documentation.	
	32. Create a final CMS plan and submit for National Ocean Council (NOC) review.	
	33. Implement, monitor, evaluate, and modify (as needed) the NOC-certified CMS Plan.	
E. Areas of Special Emphasis		
√	34. Resiliency and adaptation to climate change and ocean acidification. Strengthen resiliency of coastal communities and marine and Great Lakes environments and their abilities to adapt to climate change impacts and ocean acidification.	Atlas provide data, maps, participatory processes to aid community planning, decisions; IOOS RAs working toward inclusion of ocean acidification data (e.g., spatially-explicit measurement of CO_2 levels in water column)
√	35. Regional ecosystem protection and restoration. Establish and implement an integrated ecosystem protection and restoration strategy that is science-based and aligns conservation and restoration goals at the federal, state, tribal, local, and regional levels.	Atlases provide data and tools for science-based strategies for regional ecosystem protection and restoration
√	36. Water quality and sustainable practices on land. Enhance water quality in the ocean, along our coasts, and in the Great Lakes by promoting and implementing sustainable practices on land.	Atlases and IOOS RAs provide water quality monitoring data, maps, info
√	37. Ocean, coastal, and great lakes observations, mapping and infrastructure. Strengthen and integrate federal and non-federal ocean observing systems, sensors, data collection platforms, data management, and mapping capabilities into a national system and integrate that system into international observation efforts.	This project brings the major groups together to provide that infrastructure
F. Demonstrated Regional Linkages and Partnerships		
√	38. Is the idea or sponsor consistent with one or more of the following? • Represents or directly partners with the WCGA; • Possesses the authority, proven capacity, and regional relationships to effectively coordinate the development of regional ocean governance priorities that engage affected coastal states and territories and their management agencies, including the approved coastal zone management program; • Demonstrates formal commitments with the WCGA and coastal states or territories (including the approved coastal zone management program) to adopt the plan(s), product(s) or outcome(s) of a proposed project into regional or state ocean management planning processes or coastal and ocean resource management policies.	Partners in this proposal possess the authority, proven capacity, and regional relationships to effectively coordinate the development of regional ocean governance priorities.

Applic-able?	CRITERIA	Brief Description of How Idea Relates to Criterion (no more than 3 bullets)

√	39. Creates new and innovative partnerships and broader stakeholder engagement beyond the existing governmental relationships of the WCGA that will be needed for successful planning and implementation of CMSP.	State agencies with IOOS RAs