

## Coastal Observations, Applications, Services and Tools – Virtual Constellation (COAST-VC)

### Implementation Plan (March 15, 2024)

#### Recommendations and Specifications

CEOS formed COAST (Coastal Observations, Applications, Services and Tools) in 2019 to provide new and improved scientific/technical capabilities and building capacity for a more robust, end-to-end value chain (observations to data to products to information to actionable knowledge) in support of coastal stakeholders and global sustainable development. There is commitment on the part of agencies participating in several UN/IOC initiatives and COAST to ensure longevity/sustainment at least through 2030. COAST will be an interdisciplinary and crosscutting VC enabling the integration of communication and activities across the three-year CEOS work plan. COAST activities link to other CEOS priorities and focus areas, such as biodiversity (ecosystem extent), biomass mapping (AFOLU), climate change and interoperability/ARD, as well as support for GEO, the SDGs, and GCOS.

COAST is implementing high-impact pilot projects that leverage the [CEOS Analysis Ready Data \(CEOS-ARD\)](#) Framework already demonstrated for terrestrial applications, and the Systems Engineering Office [CEOS Analytics Lab](#). COAST deliverables include: new coastal multidisciplinary products and recommendation of regionally tuned algorithms/models or best practices to users in regions where available coastal products yield poor results. COAST will work collaboratively with other CEOS entities toward quality improvement in available global products within 1km of the land-sea interface, to update information in coastal regions, and to provide product feedback from coastal stakeholders.

Coastal Information support is sought by many global and regional partners, and therefore, demonstrates specific opportunities for CEOS external engagement, particularly through the linkage of the Group on Earth Observations (GEO) Blue Planet and AquaWatch Initiatives, and external stakeholders such as Intergovernmental Oceanographic Commission (IOC)/Global Ocean Observing System (GOOS); United Nations Environment Programme (UNEP); World Meteorological Organization (WMO); and the UN Decade of Ocean Science for Sustainable Development (2021-2030). COAST-VC's inherently cross-cutting engagement with other CEOS entities is a catalyst for collaborative activities. Both internal and external stakeholders will be engaged, as appropriate.

COAST's efforts are user-driven, encouraging broader utilization of Earth observations and other CEOS capabilities for societal benefits within coastal zones (e.g., Blue Economy; SDG-14). Our regional pilot locations and identified stakeholders enable user co-design and co-development, which are key to the implementation process of COAST solutions. Those stakeholders and end-users include: natural resource and emergency managers, disaster first responders, governmental scientists and officials, property owners and coastal dwellers, scientific researchers, non-governmental organizations and aid agencies.

CEOS COAST identified and prioritized user-driven observing needs, issues, information gaps, and the observational trade space for COAST Pilot Projects that could be implemented in a cost-effective and resource-leveraging manner; and are described in COAST White Papers available at <https://ceos.org/ourwork/ad-hoc-teams/ceos-coast/>.

COAST will help realize “downstream”, synergistic benefits from integrating across the CEOS parameter focused VCs (i.e., a trans-parameter, ecosystem-based approach); by working trans-boundary across the land-sea interface (i.e., coupling ocean VCs with LSI-VC etc), and perhaps most importantly by facilitating

a trans-disciplinary approach, i.e., bridging the environmental and social sciences to realize valuable societal benefits for the coastal zone. Being primarily focused on the coastal realm and serving the needs of ‘downstream end-users’, the COAST-VC will complement, not compete with, the work of these other WGs and VCs. Active and sustained communication across CEOS will be key to ensuring this approach is successful. COAST-VC will primarily focus on leveraging the innovative, upstream data product development from the parameter-focused VCs, creating integrated products and extracting derived information.

Participation in the COAST-VC is open to all CEOS Members or Associates, partners (as invited), or CEOS WG, VC, AHT members willing to support and contribute to activities that are in scope with its mission and objectives. CEOS members that are not already part of the COAST-VC, but are interested in participating are encouraged to contact the Co-leads directly for inclusion and integration into the COAST-VC and its activities. Similarly, CEOS Agencies that wish to sponsor one or more contributors from a university or institute in their country (invited partners) are encouraged to contact the COAST-VC Co-leads.

## Schedule

### CEOS COAST’s goals are to:

- 1) Leverage data from existing as well as newer missions and sensors and processing technology for coastal products, both near-term (2-3 years) and long-term (4+ years);
- 2) Raise awareness by conducting regular stakeholder meetings and capacity building programs for use of COAST products by end-users;
- 3) Develop new and improve existing coastal products (for example for Coastal Eutrophication Artificial Intelligence-based Anomaly, Blue Carbon products, and Refined products for polar regions); and
- 4) Complement the work of the other WGs/VCs and fill information gaps, and participate in mutually beneficial collaborations with other WGs/VC/SDG CGs, when practical. Selection of high quality datasets will benefit from collaboration with the other ocean-related VCs. COAST will complement the work of other VCs by supporting their direct application in coastal regions impacted by climate change. This includes impacts to biodiversity, disasters, understanding direct consequences of changes in the hydrological cycle, etc.

COAST’s long-term schedule appears below (dark shading indicates primary work effort, lighter shading indicates minor work effort, no shading indicates no anticipated effort):

TASK	2024	2025	2026	2027	2028	2029	2030
<b>VC level tasks</b>							
Monthly Meetings							
Annual In-person Meeting (nominally SIT TW Side Event)							
VC required reporting to SIT (quarterly) and CEOS (every 2 years)							
<b>Delivery of COAST Products in Pilot Regions</b>							
CEOS Pilot Land2Sea							
CEOS Pilot Sea2Land							
CEOS Polar Regions Pilot products							
Reassessment of Themes & Pilot areas							
<b>Broader Community Engagement and Partnership</b>							
Regional Stakeholder Meetings utilizing co-Design of products							
Engage with UN Ocean Decade							
Engage with External Partners (UNEP, GEO, CoastPredict)							
Collaborate with other CEOS WG’s, VC’s, and SDG CG							
Host a CEOS COAST Training during UN Ocean Decade Event							
Hold a CEOS COAST Training Workshop							

The COAST-VC's detailed initial schedule appears below. Please refer to COAST's latest annual work plan for further details.

TASK	2024				2025				2026		
	Mar	July	Sept	Dec	Mar	July	Sept	Dec	Mar	July	Sept
<b>Phase 1 Transition to VC</b>											
Updated Annotated Bibliography 2											
Cross VC-WG Collaboration Communications within CEOS											
<b>Phase 2 - Pilots and Products</b>											
Detailed Assessment and Gaps in COAST product delivery											
<b>CEOS Pilot Land2Sea</b>											
<b>CEOS Pilot Sea2Land</b>											
<i>Develop relevant Polar products</i>											
CEOS COAST COAST Predict Joint Workshop Development											
<b>Phase 3 - Broader Community Engagement and Partnership</b>											
CEOS Co-led Stakeholder Meeting - Bay of Bengal											
CEOS Co-led Stakeholder Meeting - Chesapeake Bay											
CEOS Co-led Stakeholder Meeting - Small Island Nations											
CEOS Co-led Stakeholder Meeting - La Plata Estuary											
CEOS Co-led Stakeholder Meeting West Africa											
CEOS Co-led Arctic Stakeholder meeting (OSOS-4?)											
<a href="#">Collab with WG CalVal</a> on satellite-derived bathymetry and expanding cal-val data sets in inland and coastal waters											
<a href="#">Collab with WG CalVal</a> on satellite-derived bathymetry and expanding cal-val data sets in inland and coastal waters											
<a href="#">Collab with LSI-VC: algorithm testing in coastal areas</a> (SEADAS algorithm refinement and ENMAP team work, even fusing S2 products)											
Promote biomass mapping products/ <a href="#">Afolu for JAXA</a> especially in Bay of Bengal regional outreach											
Collab with OCR-VC: Support CEOS Aquatic Carbon Roadmap outcomes											
Collab with WGClimate to address the GCOS IP 2022 actions on "Improving monitoring of coastal and exclusive economic zones" in 3 areas											
Collab with WG Climate on a coastal Use Case											
Host a CEOS COAST Training during UN Ocean Decade Event											
Hold a CEOS COAST Training Workshop											
<a href="#">Collab with LSI-VC: Implement ARD Infrastructure in CEOS Analytics Lab - Interoperability Testing</a>											
Collab with OSVW-VC to gather stakeholder/user feedback on coastal winds products											
Collab with SST-VC on GHRSSST session: a joint CEOS-COAST / GHRSSST workshop at the next SST symposium / GHRSSST meeting in Montreal (and online)											
Contribute to WGISS Interoperability Handbook 2.0 review team											
CEOS COAST COAST Predict Joint Workshop Development											
Collaborate with SDG CG annual updates to EO support sheet for SDG 14.1.1											

## Accreditation and Recognition Metrics

CEOS COAST's success over time will ultimately be measured by the release and end-user utilization of coastal data products via the COAST Application Knowledge Hub.

New product development will be stakeholder-driven, designed to meet a documented end-user need, and prioritized within CEOS COAST by agency interest in leading the development effort.

Where possible, social science professionals will contribute to the product development and training process.

Where feasible, COAST will leverage CEOS tools and resources, e.g., the CEOS Analytics Lab for product development and WGCAPD for stakeholder engagement.

Data products will be co-developed with stakeholders using:

1. The best-performing algorithms and models available for the region, or the best available CEOS agency-supplied information (when options are limited).
2. Best practices for processing and Cal/Val
3. High-quality data sets (where practicable)
4. Adhering to CEOS-ARD standards and FAIR Principles and CARE (Collective Benefit, Authority to Control, Responsibility, and Ethics) Principles for Indigenous Data Governance (where practicable)

Product-level uncertainties will be reported to users in a clear and concise format on COAST's Application Knowledge Hub.

Regional stakeholder engagement sessions and training opportunities will measure success with informal, voluntary entry and exit surveys by participants. Indigenous peoples and under-served populations will be among the invited regional stakeholders in all pilot regions.

Upon product release (or upgrade), the product development team and stakeholders will separately evaluate satisfaction with the product releases and 'meeting end-user needs' versus the original (or updated) product requirements and end-user needs assessment.