



Understanding the effect of environmental
and climate change on sustainable coastal
lagoon management

Potential and challenges for Earth Observation

ACHIEVING PROGRESS TOWARDS ENABLING A GLOBAL COASTAL LAGOONS COMMUNITY – The Lagoons for Life Roadmap for 2020-2022



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on behalf of the Lagoons for Life community



“Future vision and knowledge needs for coastal transitional environments”



Lagoons for Life (L4L)

An international initiative by scientists in the natural and social sciences, including EO scientists

Transdisciplinary

Est. September 2017

Initial Workshop

Theme 1: Lagoon monitoring and management issues

Theme 2: The potential of EO for coastal lagoon monitoring and management

Theme 3: Challenges posed and potential solutions towards future research



Questions to address

Theme 1: Lagoon monitoring and management issues

- What have been the main **trends** in coastal lagoon systems (ecological processes and human pressures) over the past decades, and can we **forecast** how these trends will develop in the future?
- How does climate change affect lagoons and what are the current **impacts** of the later?
- What are the critical aspects we (yet) need to understand on the compounding **effects** of climate change and environmental change in lagoons?
- What are the implications of human pressure, such as marine and land pollution, and increasing resource demand and exploitation, on lagoon **sensitivity** to environmental and climate change?



Questions to address

Theme 2: The potential of Earth Observation for coastal lagoon monitoring and management

- Are the current ESA CCI ECVs **suitable** for global coastal lagoon monitoring and environmental assessments? How can we **add value** to the ECVs by combining these with other data (EO, *in situ*, socio-economic, *etc.*) for investigations of the social and biophysical coupling processes in lagoons?
- How can EO support international conventions and agreements in their efforts towards improving **sustainable development** of lagoon, and lagoon-neighbouring, regions?
- Can EO and ESA CCI ECVs help improve **indicators** used to evaluate and monitor lagoon systems in line with achieving the UN Sustainable Development Goals, especially SDG6, SDG14 and SDG15?
- What information and datasets are required to support (inter)national **policy** instruments in lagoon systems (e.g. protected areas, payment for ecosystem services, certification systems, *etc.*)?



Questions to address

Theme 3: Challenges posed and potential identified solutions towards future research

- What are the **challenges** in employing EO in lagoon ecosystem studies and what knowledge **gaps** still exist? Which thematic datasets are further required?
- What type of field data are required to **validate** EO products and study change in lagoon ecosystems, and how can the scientific community derive those?
- What are the **obstacles** in integrating EO data in lagoon management strategies?
- Can the Copernicus Sentinel-series help **overcome** challenges in lagoon ecosystem assessments?



Evaluate the **potential and challenges for EO** in coastal lagoon monitoring and management

Create a **centralised global inventory** of lagoon data and research initiatives

Strengthen **joint research** activities between international EO and coastal zone/coastal lagoon research communities

Co-design lagoon management strategies under the umbrella of the UN SDGs, Paris Agreement, Aichi Targets and Sendai Framework, *etc.*

- # Introduce new methods to traditional approaches
- # Exploit vast amount of information available from EO

- # Identify gaps in data and knowledge

- # Bridge EO with non-EO sciences
- # Bridge natural with social sciences

- # Develop holistic approaches
- # Sustainable coastal lagoon management

EO

In situ Ex situ

In vitro

Models

Paleo-data

Theoretical frameworks

Stakeholder knowledge



Lagoons **for LIFE**



The L4L Network

International programmes and initiatives:

- Future Earth Coasts (FEC)
- Sustainable Water Future Programme (SWFP)
- International Geosphere-Biosphere Programme (IGBP)
- Community Surface Dynamics Modeling System (CSDMS)
- World Climate Research Programme (WCRP)
- Group on Earth Observations (GEO) Blue Planet
- Integrated Marine Biosphere Research (IMBeR)
- UN Environment GEMS/Water Capacity Development Centre

National space or research agencies:

- German Aerospace Center (DLR)
- US National Oceanic and Atmospheric Administration (NOAA)

National centres, networks and institutes:

- Venice Resilience Lab – Wigwan Local Community
- National Marine Fisheries Research Institute (NMFRI), Poland
- Hellenic Centre for Marine Research (HCMR), Greece

Universities:

- Università degli studi di Parma, Italy
- Università degli Studi di Trento, Italy
- University of Stirling, United Kingdom
- University College Cork, Ireland
- University of Algarve, Portugal
- Stockholm University, Sweden
- University of Waterloo, Canada
- Morgan State University, USA
- University of Colorado, USA
- University of Cambridge, United Kingdom
- University of Dundee, United Kingdom
- Marine Research Institute, Klaipeda University, Lithuania
- University of Lisbon, Portugal
- University of Patras, Greece
- Drexel University, USA
- University of Murcia, Spain
- University of Portsmouth, United Kingdom

Industry and SMEs:

- Brockmann Consult GbmH, Germany
- Odermatt & Brockmann GbmH, Switzerland
- UK NERC Plymouth Marine Laboratory (PML)



Achievements

1. An **active community**:

- Use of social media and L4L website
- Networking at meetings
- New research projects, e.g. H2020 CERTO (presented yesterday)
- 2018 ASLO Summer Meeting Special Session: "Unlocking the potential of Earth Observation in coastal lagoons and estuaries"

2. Identification of **key study areas** and development of preliminary fieldwork plans towards pilot studies:

- 14 coastal lagoons were identified as case studies
- Preliminary survey identified sites that are well described and others that aren't
- List of available datasets and data sources

3. **Publications**:

- White Paper drafted
- Academic journal publication in preparation

4. **Collaborative research funding** proposal focused on addressing key gaps, opportunities and drivers:

- H2020 CERTO (Copernicus Evolution: Research for harmonised Transitional water Observation)



Roadmap 2020-2022

- # Map key actors and discuss partnership avenues
- # Link with GEO Initiatives and Community Activities, e.g. GeoGLoWS, DELTA&ESTUARY, AquaWatch, EO4SDG

Increase network and link with other relevant initiatives

- # Continue to work on global inventory
- # List past and existing projects
- # Distribute survey

Inventory of data and information, Identify and address gaps



Set clear targets and milestones to better coordinate tasks and activities

- # Appoint Coordination Committee

Increase awareness through events, sessions and publications

- # Target specific events and organise participation through the L4L network

Foster new ideas, research, solutions

- # Identify research opportunities
- # Discuss collaborations within and outside L4L network

Lagoons for Life mini workshop
Friday 24th January 2020
ISMAR, Venice
14:30-17:30

With thanks

Sustainability of the World's Coasts

TRANSITIONING TOWARDS
RESPECTFUL CUSTODIANSHIP
OF OUR COASTS



futureearth coasts 

futureearth
coasts 

land-ocean interactions in the coastal zone

<https://coastalfuturesconference.com>

Our Coastal Futures

Transitioning towards a
respectful custodianship of our
oceans and coasts

19-22 October 2020
Southern Cross University
Gold Coast, Australia



FEC's new leaflet