A PROGRAMME FOR THE UN DECADE OF OCEAN SCIENCE FOR SUSTAINABLE DEVELOPMENT

CoastPredict –Observing and Predicting the Global Coastal Ocean

Lead Contacts: Nadia Pinardi (nadia.Pinardi@unibo.it) and Villy Kourafalou (vkourafalou@rsmas.miami.edu) and Joaquin Tintore (jtintore@socib.es)

Theme: A predicted global coastal ocean where society understands and can respond to changing ocean conditions

Web Link to more program information

https://www.coastpredict.org/

Open consultation open in February 15 2020

https://www.coastpredict.org/

250 signatures from 35 countries

29 "Projects" submitted

International Steering committee, Advisory committee ECOP

Chair: N.Pinardi (Univ. of Bologna, IT)
Co-Chairs:
V.Kourafalou (Univ. of Miami, USA)
J.Tintore (SOCIB, Spain)

Co-design partners:
GOOS, IODE, IODE/OBPS, **CEOS-COAST, Geo-Blueplanet, WMO-WWRP**

Synergistic Decade programs:
GEOS, EquiSea, OceanPredict, etc.

Coastpredict has been, and will be, co-designed with international UN programs: first is GOOS

developing #OceanDecade programme proposals

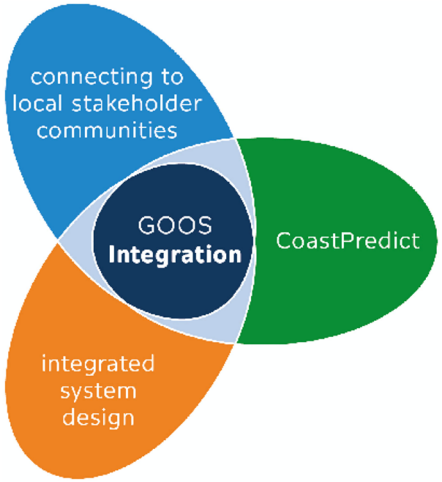
The Global Ocean Observing System

Connecting to many local stakeholder communities as providers and users of ocean observations, deepening engagement and participation in GOOS

lead developers: Molly Powers and Kim Currie

Working across networks and platforms to actively design the system needed to deliver an integrated, responsive, and sustained observing system for climate, forecasts and early warnings, and ocean health

lead developers: David Legler and Sabrina Speich



Integrated observations, forecasting and technology to deliver essential information in coastal applications

lead developers: Nadia Pinardi, Villy Kourafalou, Joaquín Tintoré

coastpredict.org

contact point: **decade@goosocean.org**

The basic concept of a Global Coastal Ocean has been defined about a decade ago in five Volumes of The Sea (Vol. 10 to 14, Harvard Univ. Press)

Coastpredict will redefine the "coastal ocean"

PROPOSED STARTING DEFINITION:

*the coastal ocean - that area, extending **inshore** from the estuarine mouths to river catchments, to the urban settlements on the one side and on the other to the **offshore,** from the surf zone to the continental shelf and slope where waters of continental origins meet open ocean currents.*

Coastpredict high level objectives

1) A predicted global coastal ocean;

2) The upgrade to a fit-for-purpose oceanographic information infrastructure;

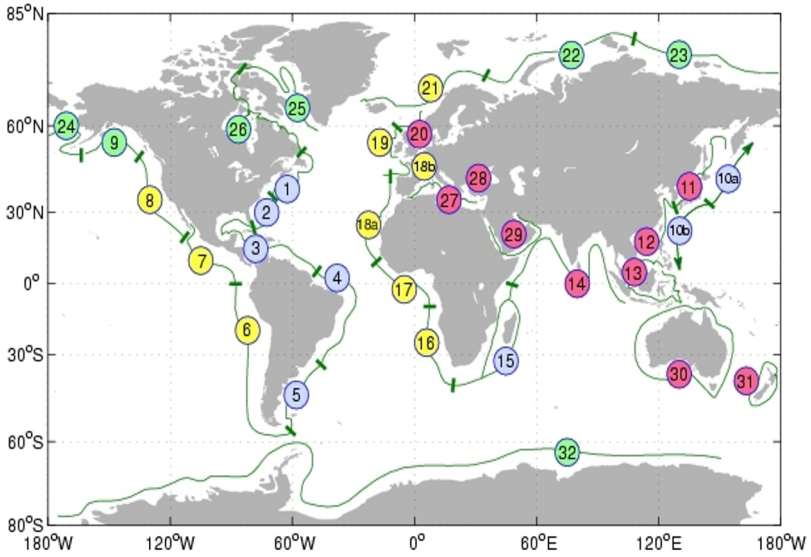
3) Co-design and implementation of an integrated coastal ocean observing and forecasting system adhering to best practices and standards, designed as a global framework and implemented locally.

Coastpredict Key Decade OUTCOMES

1. Integrated knowledge of the **global coastal ocean from events to climate** (*advancing Knowledge*);
2. The design and implementation of an **integrated river/estuarine/coastal/open ocean observing and modelling multidisciplinary** system (*integrated observing and predicting*);
3. **Improved coastal marine forecasting and extended range predictive capabilities for the coastal zone** (*accurate predictions from hours to centuries ahead*);
4. **The development of methods for trusted data/information exchange and interoperability** across the value chain and adopt these as best practices (*open and free access to coastal information*);
5. **Innovative and sustainable applications for coastal solutions/services** that directly benefit local populations, including well-being and human health (*solutions*);
6. **Increased equitable education and capacity** for observing and forecasting in the global coastal ocean (*capacity building*).
7. **Strong engagement of Early Career Professionals and promotion of education**, training and research under principles of diversity, equity and inclusion (*education, no-one left behind*)

Coastpredict new knowledge

Redefining the c**o**ncep**t** of the glob**a**l coas**t**al oc**e**an: a coastpredict project by J.Hopkins



Robinson and Brink, The Sea, Vol. 14 (2010)

A more comprehensive understanding of the multi-scale interactions that take place within the coastal ocean and the interconnected nature of coastal and shelf sea environments (land-shelf-atmosphere-open ocean).

A new process-based set of coastal ocean typologies, applicable worldwide

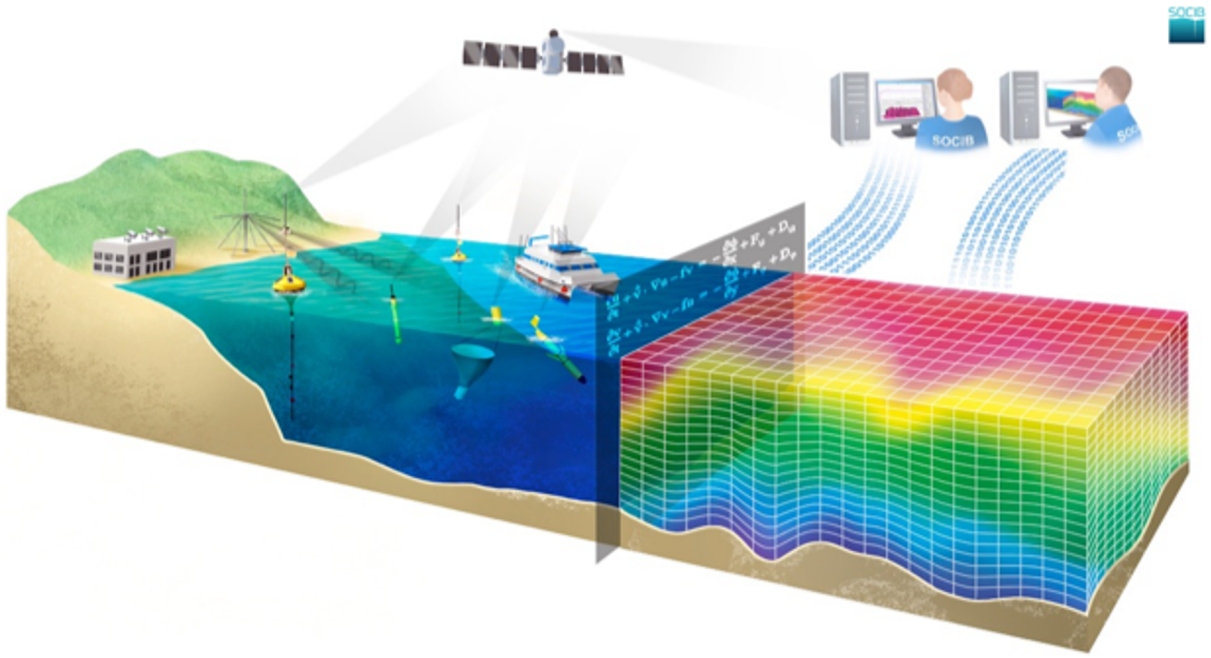
New understanding with which future coastal ocean observing systems can be optimally designed

An online tool, accessible to all, where users can generate a customised map of global coastal ocean typologies based on the processes and dynamics most relevant to their problem/interests.

Georgia Tech

GEORGIA **SMART** COMMUNITIES CHALLENGE

The Smart Sea Level Sensors Project is one of four projects under the Georgia Smart Communities Challenge. The strategies developed by the selected communities are meant to serve as models that could be implemented elsewhere to advance smart technology and improve community well-being across Georgia.



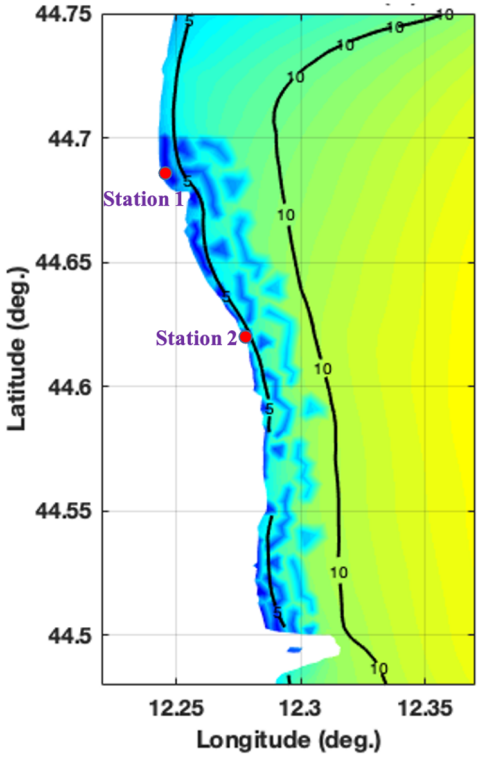
CoastPredict new observing

CoastPredict: Urban Oceanography for impact forecasting

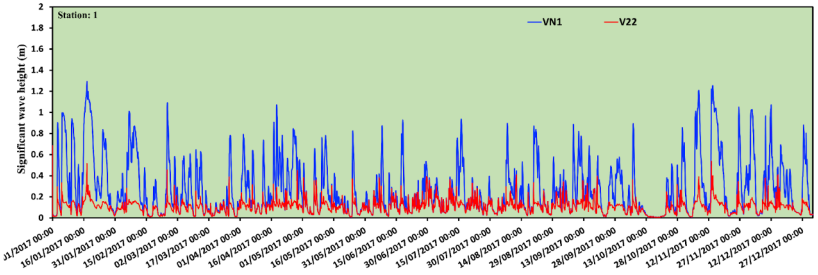
To Predict Better…
Submerged taxis in Hoboken during Hurricane Sandy

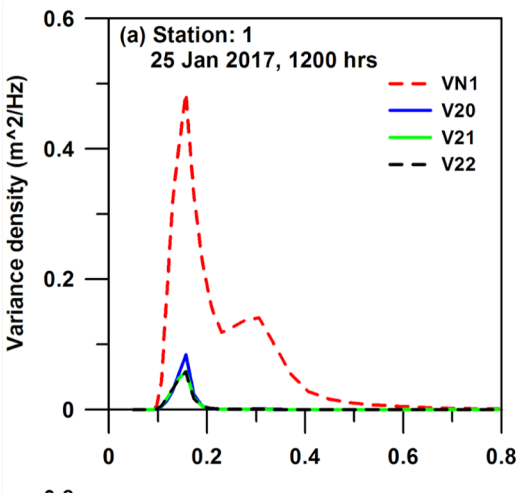
Taxis were moved to a "safer" part of town (from south to north)

CoastPredict: Nature Based Solutions against storm surge



Station 1 –
blue no vegetation / red vegetation

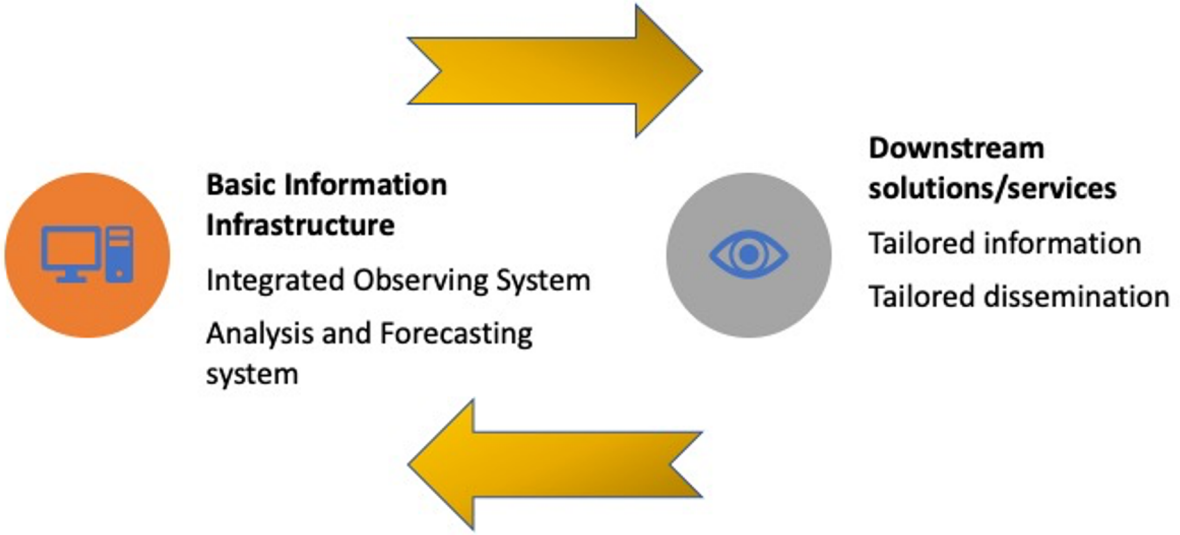




What is the transformative science in Coastpredict?

- **innovative multidisciplinary observational technologies and fit for purpose observing system in the Global Coastal Ocean,**
- **innovative numerical modelling, data assimilation and data science tools** (including Coastal Earth System Modelling);
- **coastal solutions/services**
- **a virtual information/digital infrastructure**
- a new **Global Coastal Ocean Network**

The simplified value chain and where Coastpredict mainly contributes



1. Scientific understanding of coastal processes giving rise to R2O2R developments
2. Integrated open-coastal observing
3. Improved (accuracy and time lead) and impact-based coastal forecasts
4. Best Practices for the Coastal areas

1. Coastal areas solutions for DRR
2. Solutions for Climate change mitigation and adaptation
3. Capacity Building

Coastpredict Programme Governance and working structure