Coastal Thematic Exploitation Platform (C-TEP): An innovative and collaborative platform to facilitate Big Data coastal research

Eimear Tuohy (1), Sebastien Clerc (2), Eirini Politi (1), Antoine Mangin (3), Mihai Datcu (4), Stefano Vignudelli (5), Diomede Illuzzi (6), Vasile Craciunescu (7), and Michael Aspetsberger (8)

(1) MaREI, University College Cork, Cork, Ireland (eimear.tuohy@ucc.ie), (2) ACRI-ST, Sophia-Antipolis, France (Sebastien.Clerc@acri-st.fr), (3) ACRI-HE, Sophia-Antipolis, France (antoine.mangin@acri-he.fr), (4) DLR, Germany (mihai.datcu@dlr.de), (5) CNR, Cologne, Italy (Stefano.Vignudelli@cnr.it), (6) Planetek, Bari, Italy (Illuzzi@planetek.it), (7) Terrasigna, Bucharest, Romania (Vasile.Craciunescu@terrasigna.com), (8) Catalysts GmbH, Austria (Michael.Aspetsberger@catalysts.cc)

The Coastal Thematic Exploitation Platform (C-TEP) is an on-going European Space Agency (ESA) funded project to develop a web service dedicated to the observation of the coastal environment and to support coastal management and monitoring. For over 20 years ESA satellites have provided a wealth of environmental data. The availability of an ever increasing volume of environmental data from satellite remote sensing provides a unique opportunity for exploratory science and the development of coastal applications. However, the diversity and complexity of EO data available, the need for efficient data access, information extraction, data management and high spec processing tools pose major challenges to achieving its full potential in terms of Big Data exploitation. C-TEP will provide a new means to handle the technical challenges of the observation of coastal areas and contribute to improved understanding and decision-making with respect to coastal resources and environments.

C-TEP will unlock coastal knowledge and innovation as a collaborative, virtual work environment providing access to a comprehensive database of coastal Earth Observation (EO) data, in-situ data, model data and the tools and processors necessary to fully exploit these vast and heterogeneous datasets. The cloud processing capabilities provided, allow users to perform heavy processing tasks through a user-friendly Graphical User Interface (GUI). A connection to the PEPS (Plateforme pour l'Exploitation des Produits Sentinel) archive will provide data from Sentinel missions 1, 2 and 3. Automatic comparison tools will be provided to exploit the in-situ datasets in synergy with EO data. In addition, users may develop, test and share their own advanced algorithms for the extraction of coastal information. Algorithm validation will be facilitated by the capabilities to compute statistics over long time-series. Finally, C-TEP subscription services will allow users to perform automatic monitoring of some key indicators (water quality, water level, vegetation stress) from Near Real Time data.

To demonstrate the benefits of C-TEP, three pilot cases have been implemented, each addressing specific, and highly topical, coastal research needs. These applications include change detection in land and seabed cover, water quality monitoring and reporting, and a coastal altimetry processor. The pilot cases demonstrate the wide scope of C-TEP and how it may contribute to European projects and international coastal networks.

In conclusion, CTEP aims to provide new services and tools which will revolutionise accessibility to EO datasets, support a multi-disciplinary research collaboration, and the provision of long-term data series and innovative services for the monitoring of coastal regions.