**Workshop on update of metadata, data availability and application needs for a CCLME ECO-GIS viewer**

United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

Organisation des Nations Unies pour l'éducation la science et la culture

Commission océanographique intergouvernementale

Organización de las Naciones Unidas para la Educación la Ciencia y la Cultura

Comisión Oceanográfica Intergubernamental

Организация Объединенных Наций по вопросам образования науки и культуры

Межправительственная океанографическая комиссия

# GIS applications, spatial modelling and open data portal

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**Marine Policy and Regional Coordination Section**

Section de Politique Maritime et de la Coordination Régionale

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Морская политика и Региональная координация

# Objectives and content

- …ensure the richest debate as possible on spatial analysis and data availability, necessary for the delivery of a dynamic GIS tool to explore, analyze and compare data.

1. Indicators vizualization tools
    - Transboundary Waters Assessment Program (TWAP)
    - Ecosystem services indicators tool

- …with the aim to make metadata accessible and to improve data flows into analytical tools for ecosystem modeling.

2. Open data portal (CKAN)
3. Spatial-Dynamic model

# 1. Indicators vizualization tool - TWAP

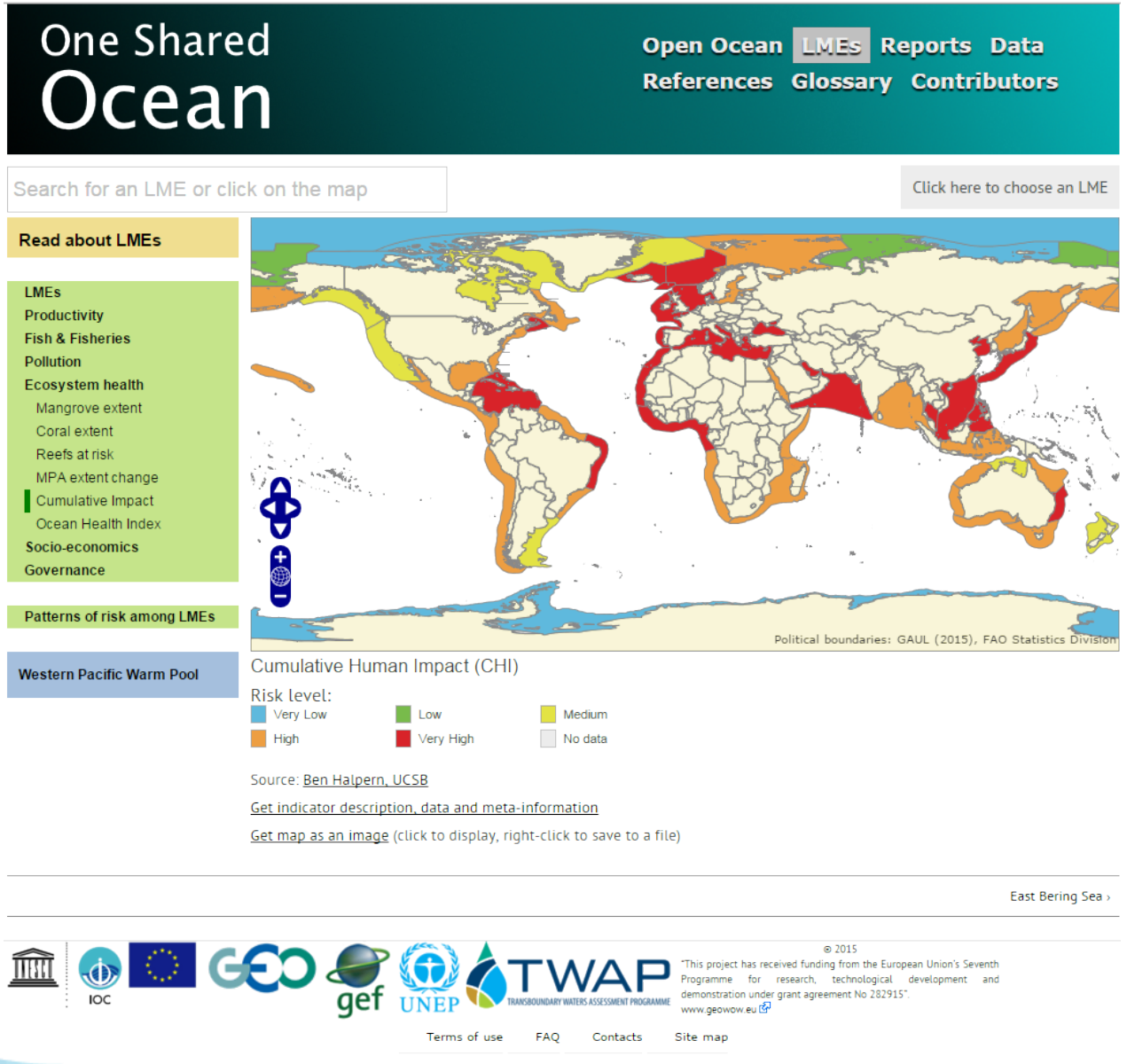
- Specifications:
  - **Global Environmental Facilities (GEF found project)**: the main users are the GEF itself, policy makers and international organizations;
  - **Geographic dimension:** Large Marine Ecosystems
  - **Thematic dimension:** 66 LME factsheets, showing indices and narratives for a given LME
  - **Time dimension:** Time-series
  - **Requirements:** Global maps, factsheets (narratives), Interactive charts, data to download, Web services and product descriptions;
  - **Web-site:** http://onesharedocean.org/?q=node/64

# 1. Indicators vizualization tool - TWAP

Main outcomes of the application:

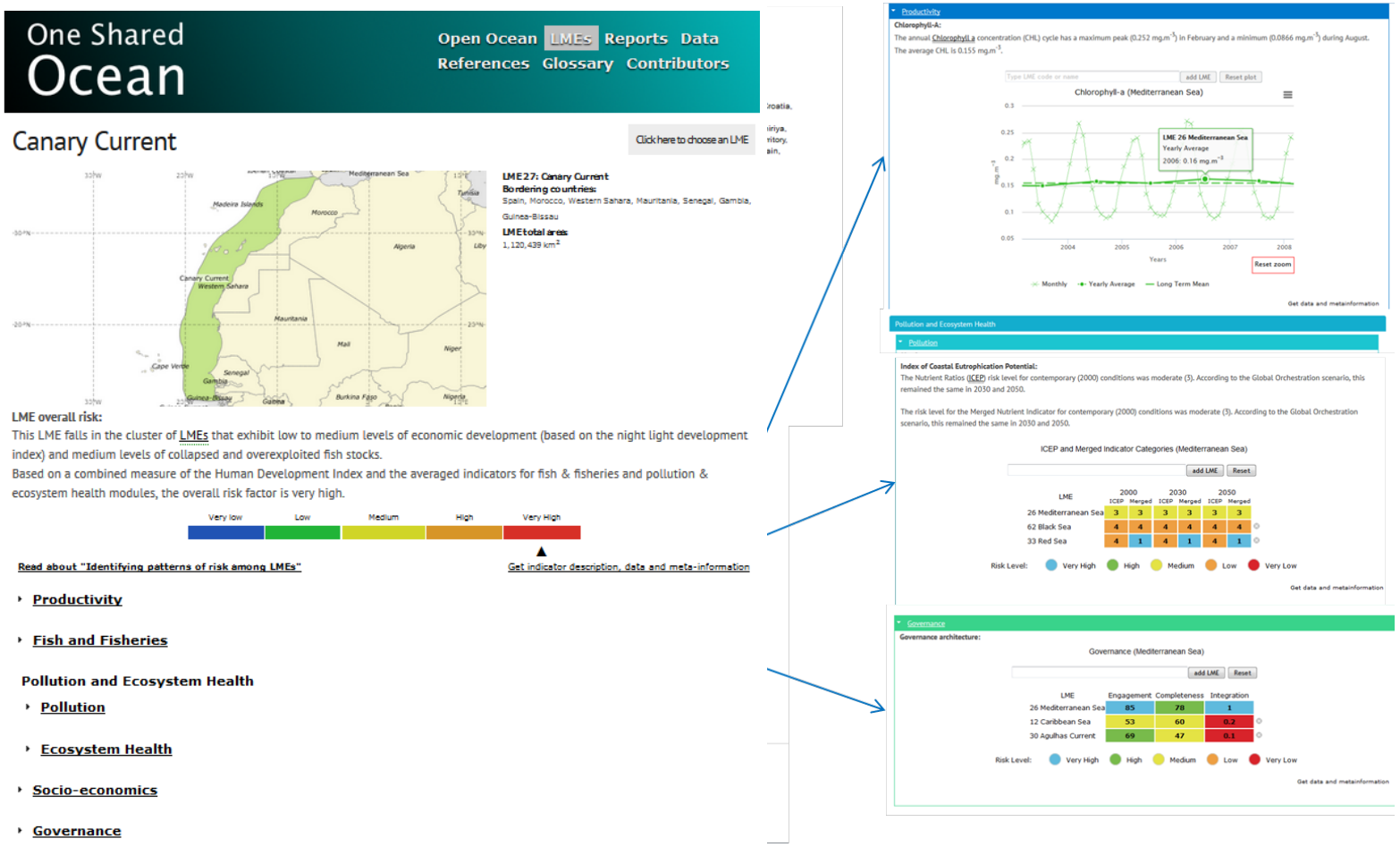
- Global maps,
- Showing indices values

- Productivity,
- Fish & fisheries,
- Pollution,
- Ecosystem health,
- Socio-economics, and Governance



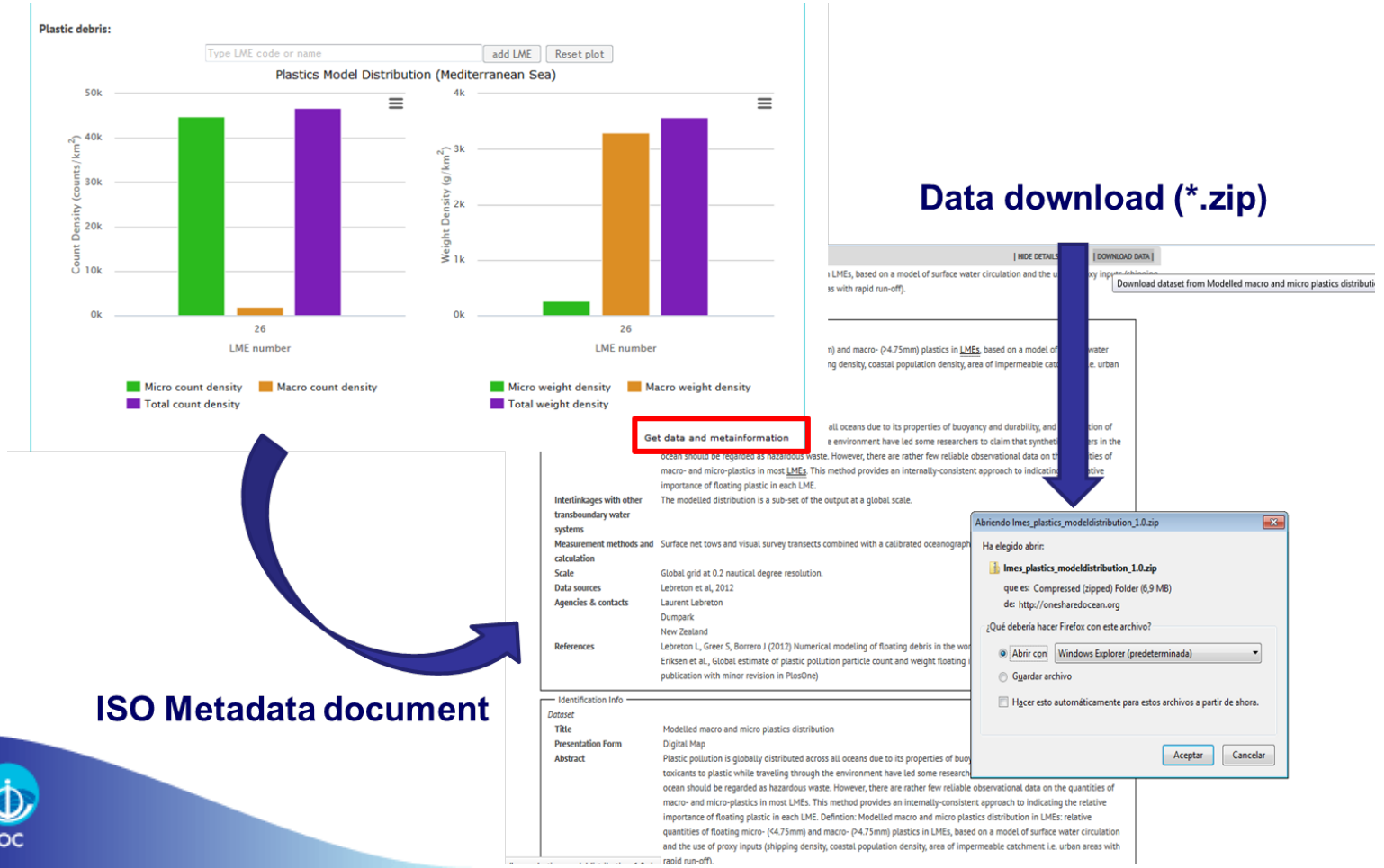
# 1. Indicators vizualization tool - TWAP

Main outcomes of the application: **Interactive charts** allowing to compare indices between LMEs



# 1. Indicators vizualization tool - TWAP

Main outcomes of the application: Data page: data to download, Web services and product descriptions



# 1. Indicators vizualization tool - TWAP

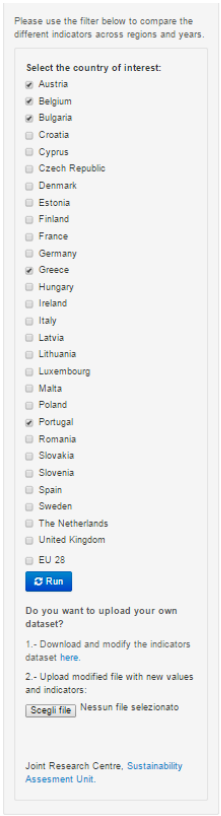
- Technology:
  - **** Server side ****
  - Server OS: Linux
  - Web server: Apache2
  - SDI: Geoserver
  - **** SDI communication ****
  - OGC web services, including WMS (served by geoserver)
  - Connected to UNEP SDI for TWAP geoportal application
  - **** Client side ****
  - CMS (content management system): Drupal 7
  - Interactive graphics: javascript, using HighCharts API
  - Interactive maps: OpenLayers (WMS interaction with geoserver)
  - Database interface: PHP 5. Data downloadable in a zip, showing meta-information

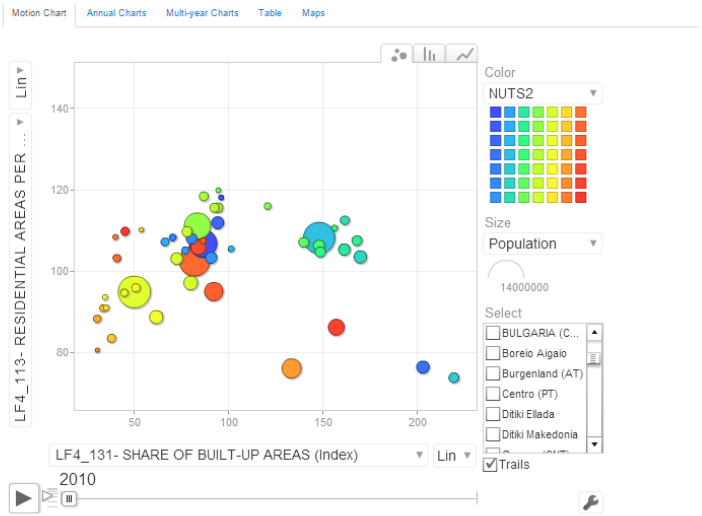
# 1. Indicators vizualization tool - LFT

- Specifications:
  - **Geographic dimension:** 2 geographic reporting layers
  - **Thematic dimension:** six thematic groups and ~55 indicators
  - **Time dimension:** Time-series (2010, 2020, 2030, 2040, 2050)
  - **Requirements:** GIS mapping and chart (comparison, composition and relationships)
- Technology:
  - R Shiny - http://shiny.rstudio.com/
  - Shiny a framework to develop web apps based on R scripts;
  - R libraries used: Shiny, GoogleVis, rCharts , tmap

# 1. Indicators vizualization tool - LFT

- Main outcomes of the application:
  - **Motion chart (Temporal trend graphs)- googleVis**
  - Spiderweb/radar charts
  - Vertical bar graphs
  - Export maps for country and regions - Tmaps
  - Data tables filtering and ranking



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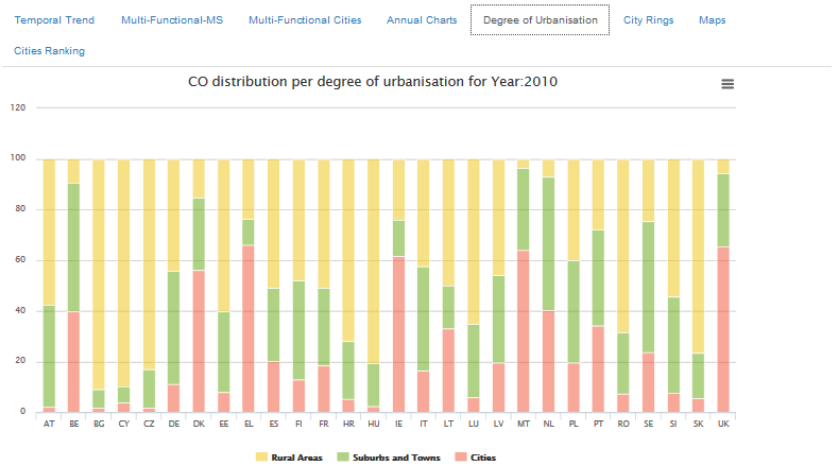

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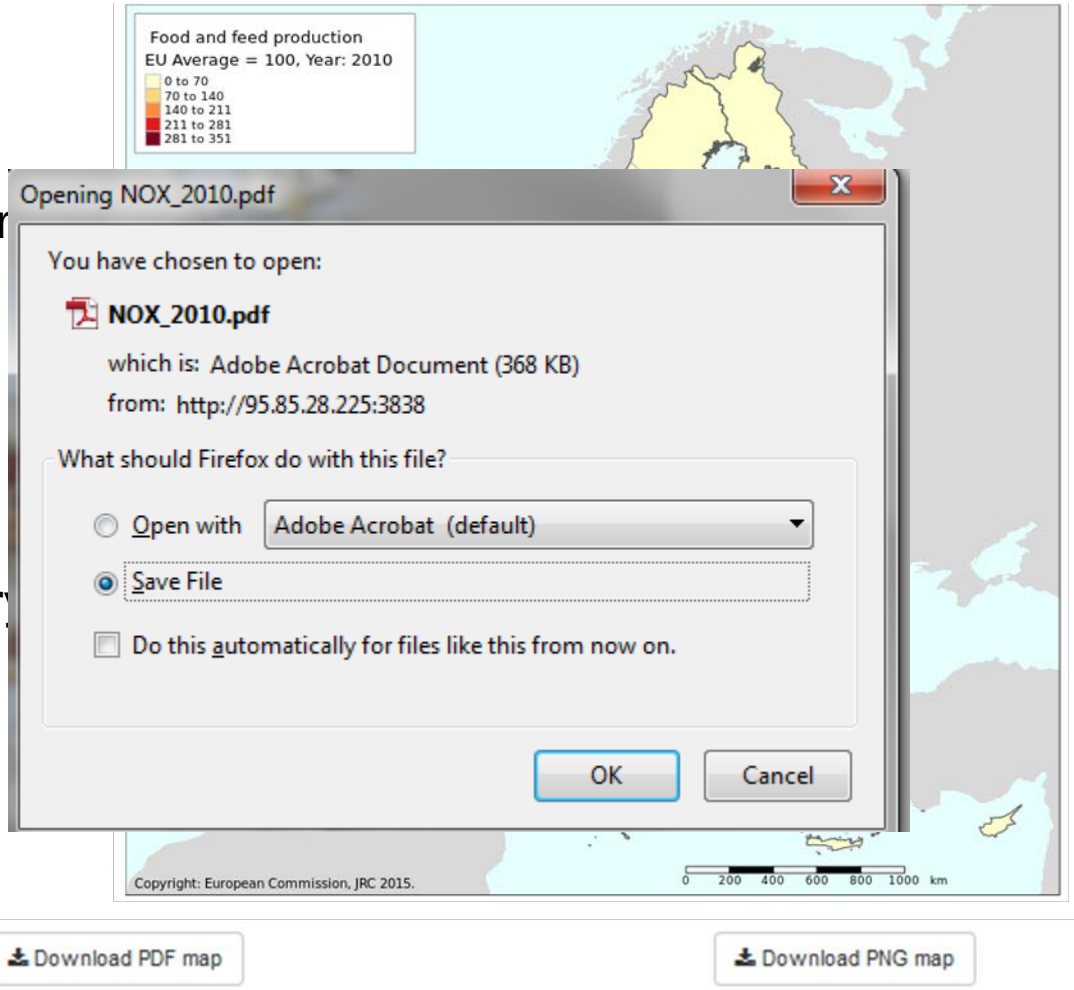

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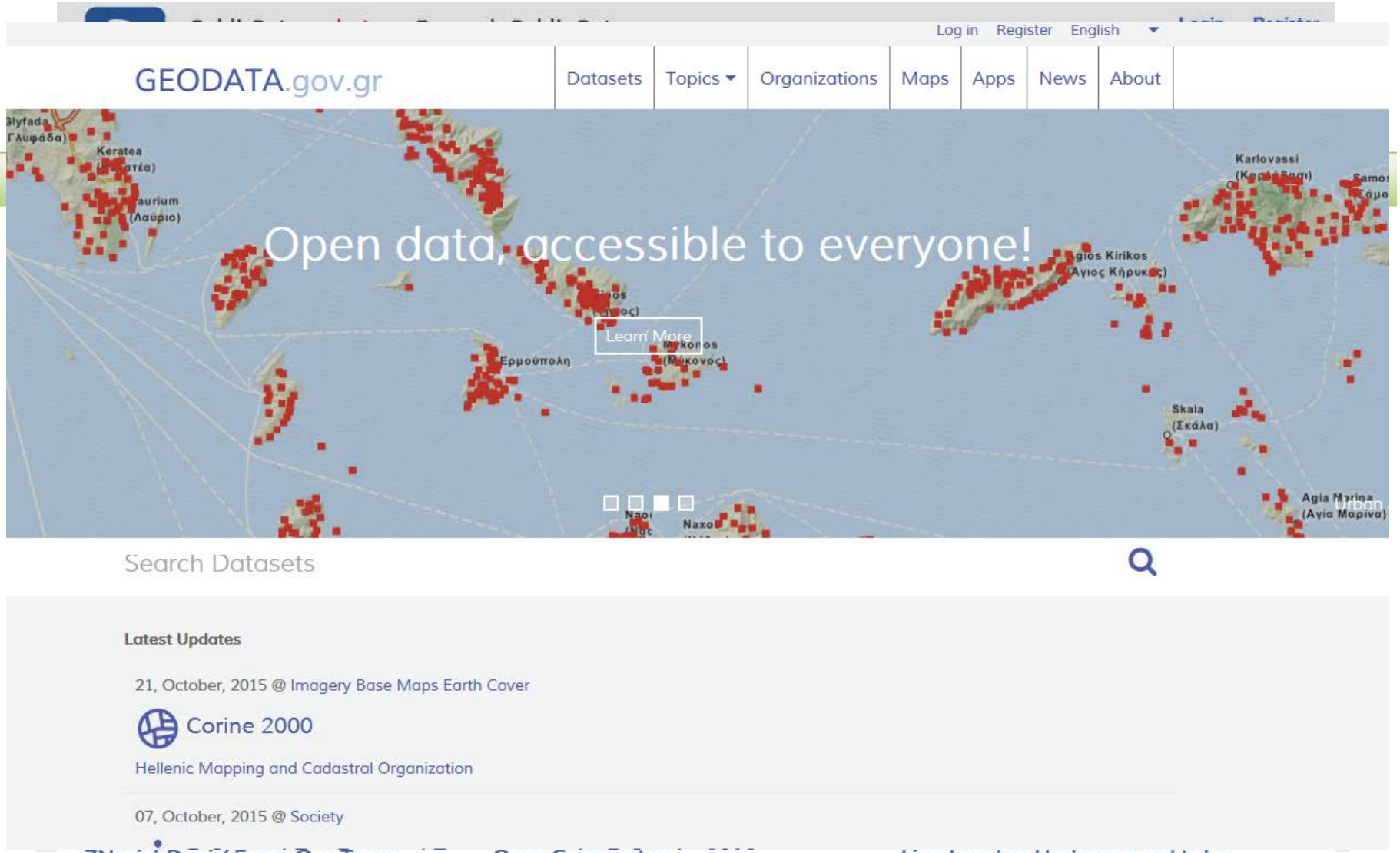
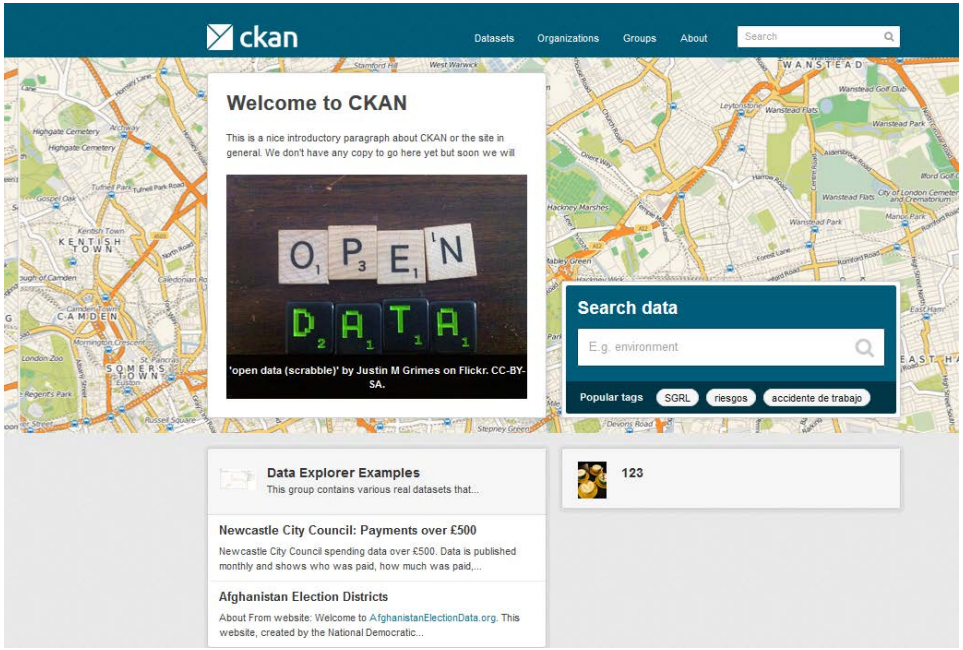
# 2. Open source data portal



# 2. Open source data portal

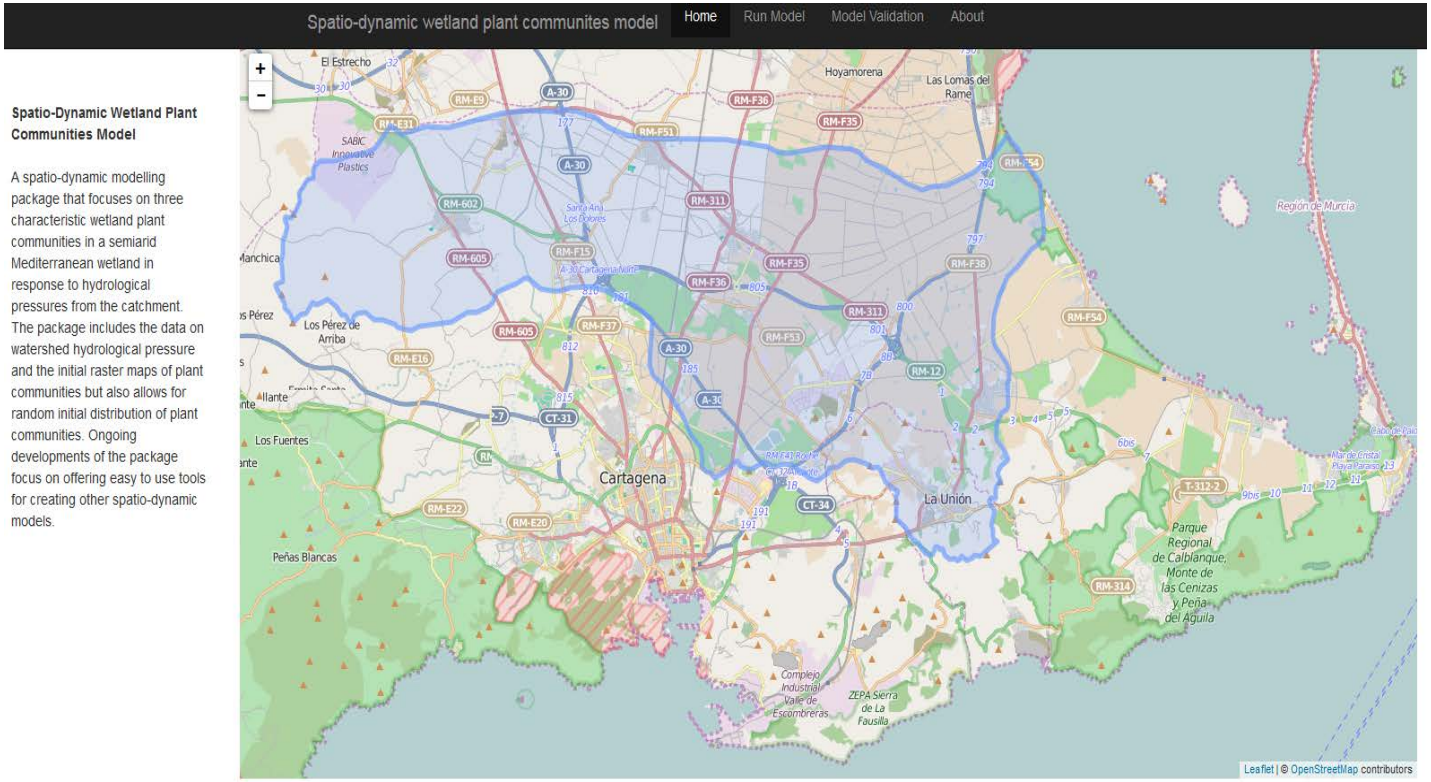
- Specifications:
  - **AQUACROSS H2020 project:** researchers, project partners, European Comission;
  - **Geographic dimension:** pilot case studies
- **Requirements:** cataloguing, interrogation, manipulation, and visualisation of diverse relevant datasets and documentation on water and biodiversity.

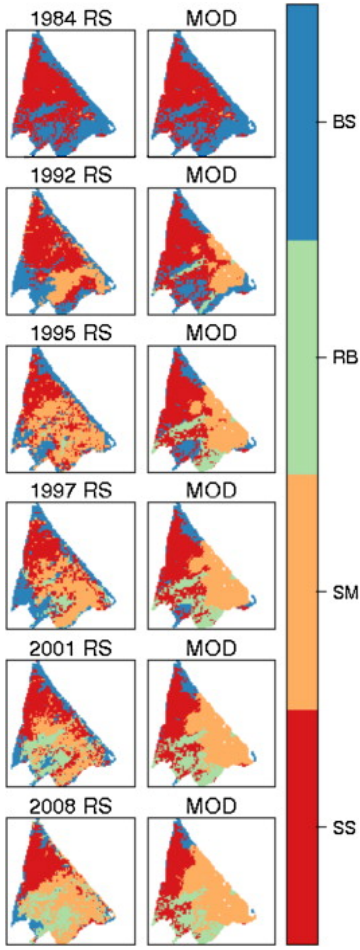


# 2. Open source data portal

- Technology:
  - CKAN is an *open-source data portal* platform is a powerful **data management system** that makes data accessible - http://ckan.org/ .
  - CKAN is aimed at data publishers (national and regional governments, companies and organizations) wanting to make their data open and available.
  - CKAN Python on the server side
  - Postgres/postgis for the database management system
  - javascript for the front-end libraries such as recline.js and leaflet.js

# 3. Spatial temporal model



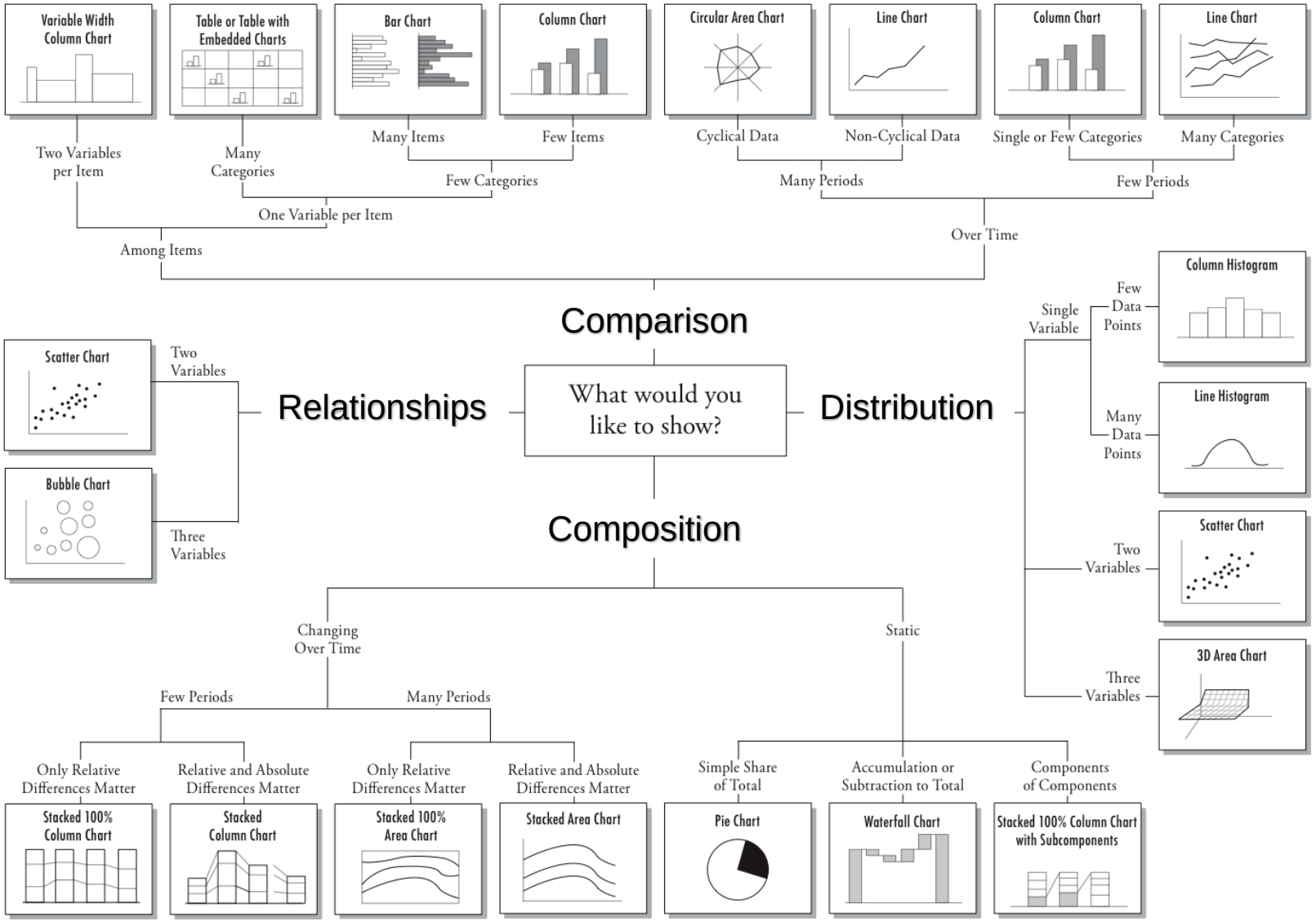




Martínez-López, J., Martínez-Fernández, J., Naimi, B., Carreño, M.F., Esteve, M.A., 2015. An open-source spatio dynamic wetland model of plant community responses to hydrological pressures. Ecological Modelling.

# 3. Spatial temporal model

- Tecnhology
  - Open CPU- https://www.opencpu.org/
  - OpenCPU is a system for embedded scientific computing and reproducible research -based on R.
  - Leaflet -an open-source JavaScript library for mobile-friendly interactive maps
- Github
  - Spatial temporal model: https://github.com/javimarlop/spdynmod
  - Graphic interface: https://github.com/javimarlop/spdynmodocpu

# Charts Suggestions




**Thank you!**
**Muito obrigado!**
Merci beaucoup!
¡Muchas gracias!
شُكْرًا
Спасибо
谢谢
http://ioc.unesco.org