OpenEarth Data management

Introduction to OpenEarth Data management

OpenEarth is an initiative on dealing with Data, Models and Tools in earth science projects. OpenEarth provides free and open source models and tools. OpenEarth aims for a more continuous approach to data & knowledge management. It provides a platform to archive, host and disseminate high quality data, state-of-the-art model systems and well-tested tools for practical analysis. OpenEarth aims for reproducible and transparent workflows and open data. OpenEarth Data management is built with open source software components that provide internationally accepted web services. Figure 1 is a schematic description of the integrating role of OpenEarth Data management in data intensive projects and systems.

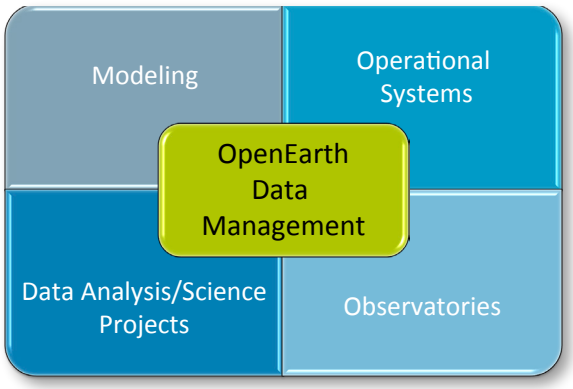

Figure 1 OpenEarth datamanagement as base of projects and systems

OpenEarth in (inter)national projects

OpenEarth aims for sharing and reusing data and has its place in data intensive projects in the (geo) physical environment. Often these (inter)national projects are multidisciplinary, involve various partners, are dynamic in space and time with high demands on accuracy, performance and visualisations. Projects span the entire cycle from physics, via biological systems to effects on geological and climate scale. This type of research comes with a range of inputs of data from sensor enabled networks via, citizen networks to earth observation and models in/outputs. Clear information extraction from this Big Data streams is a very important part of this kind of knowledge intensive projects.
OpenEarth includes a variety of products on different levels of development.
Most practical applicable products are:

- OpenEarth DataLab (showcase: Sand Motor),
- Water Information Systems (showcase: MajiSys and EU FP7 Space FAST)

OpenEarth DataLab

The OpenEarth DataLab provides a platform for a (closed) community to organise, share, visualise and use (geo) data in a generic way as a solid knowledge base allowing to focus on key questions (e.g. modelling, monitoring, evaluation, research) rather than restructuring and gathering data over and over again. The OpenEarth DataLab is an integrated web-based system that facilitates reproducible and transparent workflows as envisaged in the OpenEarth data approach.
The OpenEarth DataLab development is a cooperation between Deltares and 3TU.Datacentrum.

OpenEarth WIS

OpenEarth WIS is used in a wide variety of projects ranging from data science via in situ measurements, high frequency continuous measurement and operational systems to earth observation projects.

october 2015

OpenEarth WIS is currently applied in numerous projects ranging from information visualisation in the Kustviewer (Figure 2), via modelling of wave attenuation of vegetation using satellite imagery (Figure 3) to Integrated Water Resource Management projects (Figure 4).

Transfer of knowledge

OpenEarth knowledge presents tips and tricks, best practices and latest developments of data management systems via

- Public wiki *http://OpenEarth.eu*
- capacity building
- training events on Delft Software Days and on project locations

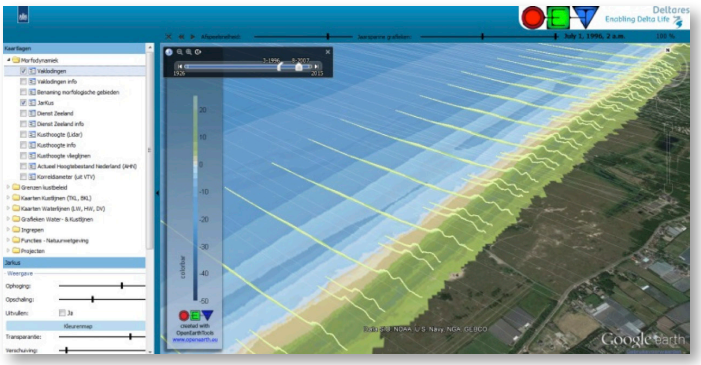

Figure 2. Screenshot from kustviewer.lizard.net

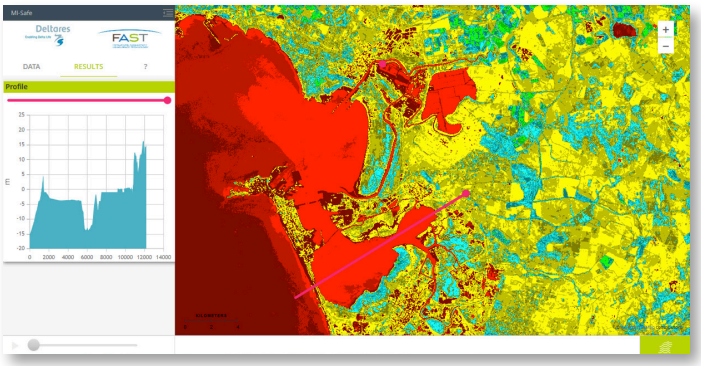

Figure 3. Screenshot of wave attenuation model using satelite imagery

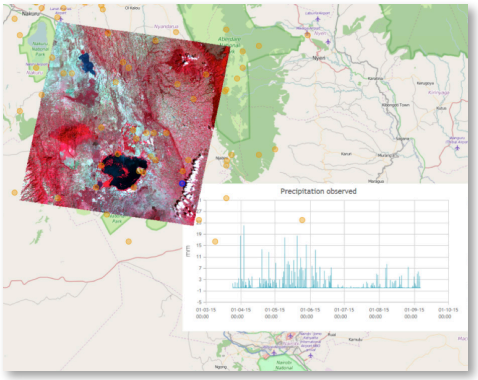

Figure 4. Water information Systems

Showcases

Sand Motor

The OpenEarth DataLab is successfully applied for the data management of the Sand Motor related data, which is hosted at 3TU.Datacentrum (Figure 6). The application for the Sand Motor data shows how a variety of data from different disciplines is stored centrally and forms the knowledge base for all related research, studies and analysis. In this way, the DataLab facilitates multidisciplinary research.

MajiSys

The MajiSys is the Water Information System for the Naivasha region. The WIS show detailed information of the Naivasha Lake region and displays all relevant information within Water Resource Management Authority of Naivasha. This WIS is powered by FEWS which takes care of the automatic insertion of time series of several rain gauges.

FAST

The EU Space FAST project deals with data derived from satellite imagery and in situ measurements of vegetation, bathymetry, topography and wave characteristics, to assess the protective role of wetlands and integrate them in flood risk management strategies. This is done by incorporating all building blocks of OpenEarth data management and use OGC services to display and generate information on the fly (by WPS and WCS).

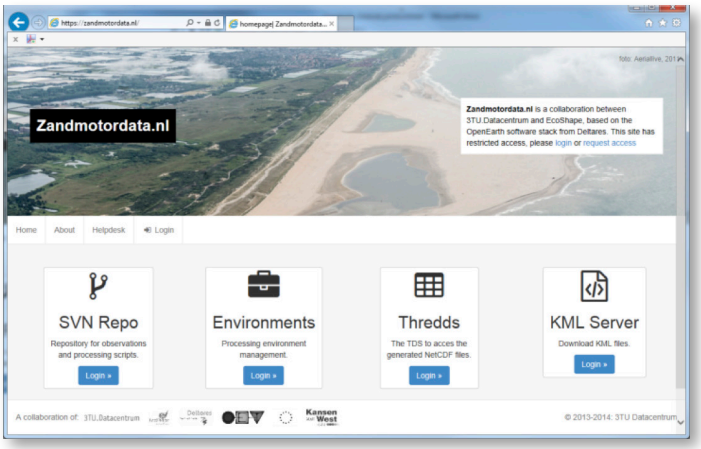

Figure 6 Home page of OpenEarth DataLab for Sand motor

List of Deltares Experts

Gerrit Hendriksen, gerrit.hendriksen@deltares.nl
Kees den Heijer, kees.denheijer@deltares.nl
Fedor Baart, fedor.baart@deltares.nl
Frank Keppel, frank.keppel@deltares.nl

Deltares

PO Box 177
2600 MH Delft, The Netherlands
T +31 (0)88 335 82 73
info@deltares.nl
www.deltares.nl

Deltares is an independent institute for applied research in the field of water, subsurface and infrastructure. Throughout the world, we work on smart solutions, innovations and applications for people, environment and society.
Deltares is based in Delft and Utrecht..