OpenEarth and EDD-Tools

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**EDD-Tools development**

- Eco mind maps / causal loop diagrams / **system design**
- **Map Table**
- BwN in system engineering
- Valuation of nature/ecology
- **Valuation of nature in SCBA**
- Dealing with uncertainties in SCBA
- BwN in Project Cost estimates Infrastructure (PRI-methodology)
Case map 'Zandwinning IJsselmeergebied'

System design from Community of Practice
Map Table

- A digital design table that is used as an instrument in spatial planning processes.
- Its purpose is to give insight in the impact of spatial measures, by combining knowledge of participants, spatial databases and models that can predict impacts.
- Map Table makes it possible to design in an interactive way.
Valuation of nature in SCBA

- Socioeconomic cost benefit analysis (SCBA) tool values the change in non-economic value due to BwN-projects as SCBA does not only include regular (financial) costs and benefits but also public goods like nature benefits and recreation aspects.
- This tool facilitates decision makers in how to value the BwN concepts to be able to compare the BwN advantages to the additional costs that might be involved.
- A SCBA gives a strong argument to start a project when the benefits for society exceed the costs.
- BwN aims to obtain price tags for nature services as bequest value and recreational perception.
OpenEarth – Inter-company management of:
data, models, tools & knowledge

Mark van Koningsveld (Van Oord/TUD)
Gerben de Boer (Deltasres/TUD)
Data

Tools

Models

Volume calculation

XBeach
Recognisable frustrations?

• hmm, what was measured here?
• huh, where was it measured exactly?
• oops, when was it measured?
• aarghh, is there still someone around who knows what was done there?

• ohhh, why does it take so long to collect data!
• #$*!, has that data been deleted?!?
• ah yeah, yet another data format … again!!!
• sigh, this problem must have been solved by someone else before me!

• oh oh, I used an old version of this tool!
• euh, what/where is the most recent version of this tool?
• why is everybody using a different tool for the same analysis?
• oh no, we’ve made the same mistake again!

• WHY CAN’T I BUILD ON THE HERITAGE OF PREVIOUS PROJECTS?
Example 1

Poor data description:

• What is measured?
• What units?
• What locations?
• Which projection?
• When measured?
• With what instrument?
• With what settings?
Example 2

Poor data description:

- Projection?
- Transparency?

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<th>Ens/V</th>
<th>Bin/Dir</th>
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<th>Longitude</th>
<th>Latitude</th>
<th>ADCP</th>
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</table>

Coordinate transformation

```matlab
% Interpretation: 5155.54385 = 51 gr 55.54385 min (to be checked)
if size(d6,2)==9; d6 = [repmat(' ',size(d6,1),1) d6]; end; % Add blanks (for the sake of consistency)
if size(d7,2)==9; d7 = [repmat(' ',size(d7,1),1) d7]; end; % idem

Lat = str2num(d6(:,1:2))+str2num(d6(:,3:end))/60;
Lon = str2num(d7(:,1:2))+str2num(d7(:,3:end))/60;
[x,y,utmzone] = deg2utm(Lat,Lon); % WGS84 transformatie
x2 = x+92.57; % Ad-hoc, local conversion to ED50
y2 = y+209.84;
```
Similar examples can be provided of tools

- Poor version control on various tools (be it: Excel spreadsheets, Matlab tools, Fortran codes etc.)
- Setup of software architecture such that the software is very hard to maintain and improve (e.g. no modular setup)
- Reinventing the wheel between departments (rather developing something new from scratch than merging efforts and collaborate)
- Hard to identify in reports which version of a tool was used (undesirable from a quality perspective)

The overall poor quality and availability of data, models, tools and knowledge inhibits knowledge development and progress!
OpenEarth: the standard for handling data, models, tools and information?

OpenEarth is:

• A robust community of users …
• that cooperate from the philosophy …
• that data, models, tools and information …
• should be exchanged as freely and openly as possible …
• across the boundary of projects (and even organisations?).
OpenEarth: the standard for handling data, models, tools and information?

OpenEarth stimulates effective cooperation by:

- Offering a **free infrastructure** built from the best available open source components (third generation – ongoing development since 2003):
  - Backup, version control and web access
  - Broadly accepted international standards (netCDF, EPSG, CF, etc)
- Exchanging all data, models, tools and information from OpenEarth projects via one **shared repository**
- Providing easy access to **training materials** for (minimal) capacity building with potential users to enable effective cooperation within the OpenEarth community
OpenEarth
Infrastructure & Workflow

Key elements:
• version control & web access
• data = raw data + script
• one data format vs. many
• central storage vs. decentral
• open source standards

1. Web access to version control and backup
2. Web access to datasets
3. Web access to visualisation

Tools data & scripts
One interface to bind them

OpenEarth Infrastructure & Workflow
TOOLS:
> 3,000 commits!
> 27,800 filechanges
> 70 active developers
> 200 users

DATA:
> 1,350 commits
> 60 active users!
Grids
Jarkus transect: Noord-Holland, 3800, 2008
Volume is: 5452.85 m³/m

\[ \text{Volume result Boundaries} = \text{getVolume}(x, x, 'z', z); \]
Volume is: 3688.35 m³/m³

```
[Volume result Boundaries] = getVolume('x', x, 'z', z, ...
   'LowerBoundary', -8, ...
   'LandwardBoundary', -10, ...
   'SeawardBoundary', 800);
```
EDD workshops
Conclusions OpenEarth

• The poor quality and availability of data, models, tools and knowledge inhibits knowledge development and progress

• OpenEarth provides an open source project superseding approach for data and knowledge management

• The OpenEarth approach is used in a growing number of projects (a.o. Building with Nature)

• You can use it too!

www.openearth.nl or www.openearth.eu