Watermanagement to the next level powered by Spatial Information

René van der Velden
April 26, 2012
Geospatial World Forum
Op Zeeniveau
At sea level
Auf Meeresspiegelhöhe
Au niveau de la mer

Over enkele kilometers passeert U de 0 meter NAP-lijn. U rijdt daarna boven zeeniveau. U bevindt zich nu precies op zeeniveau.
Flood risk areas
Need for spatial data is evident!
The Netherlands

• The Netherlands is an example of a country highly susceptible to both sea-level rise and river flooding.

• 55% of its territory is below sea level where 60% of its population lives and 65% of its Gross National Product (GNP) is produced.
• 25 Water Authorities
• Flood control, drainage and irrigation, water quality, wastewater treatment
• 10 million people and € 2,000.- billion value behind dunes en dikes
• 17,500 km dikes / 225,000 km canals and rivers
• 3,000 diked marshes
Het Waterschapshuis

• Organisation responsible for the joint (geo) information policy and its implementation for all water authorities and where the water authorities cooperate with other governments and agencies.
Spatial data for water management

- Massive data sets (big-data)
- Sensors are everywhere
- Real time availability
- Lots of detail
- Variety of needs
- Variety of techniques

-> examples and challenges
• IJkdijk is an international cooperation to develop and validate new inspection and monitoring technologies for water barriers

• focus on development, testing and validation of sensor systems in water defences.

• investigates the use of sensor network technology to support early warning systems and emergency management.
Dike Data Service Centre

- understanding behaviour of barriers
- current / predicted strength
- 2014: completion
AHN: Actueel Hoogtebestand Nederland

National elevation model of The Netherlands

1 point per 16 m²

AHN-2 (2007-2012)
8-10 points per 1 m²
• 135.200.000.000 lidar points
• Accuracy 5cm
• Also available in grids (0.5x0.5m)
3di.nu : innovation for watermanagement

• Detailed information about flooding as a result of heavy rainfall and floods;
• Immediate insight into the effects of measures;
• Realtime information, accessed via an interactive web portal;
• Clear insight in flooding by means of realistic 3D-animations.

(by TU Delft, Deltares, Nelen&Schuurmans and waterboards)
Real-time 3D visualisation based on big data sets (AHN:pointclouds-lidar)
interferometric synthetic aperture radar

- INSAR
- displacements in [mm/year]
- data will be available for years
Central governmental program for aerial photography of the Netherlands:

- High resolution – 10 cm
- Low resolution – 25 cm

yearly; started in 2012
Efficient use of available AHN-data ??
Challenges big-data

The big-data problem; well known and characterized by:

• Volume
• Velocity
• Variety

How to compete with this?
Solutions big-data (1)

- Storage
- Processing power
- Improved visualisation and advanced data modeling
- Invest in data-mining (metadata, locations, ref systems, topology) ...

..to improve:
- interoperability
- availability of data
- processing of data into information
Solutions big-data (2)

It’s not only technology:
- User requirements by demanding customers are leading
- Do we need all the details?

Let’s start with:
- Reduce redundancy of data capture;
- Intelligent use of (combinations of) techniques
THANK YOU FOR YOUR ATTENTION!