

Additional slides (for potential questions)

spatial data for all of science

Proposal for a large-scale research facility NWO interview, 10 January 2012, Utrecht

maps4science.nl





M4S ambition levels



Unique selling points

Spatial enabler for all of science

High density data ecosystem

Intensive nationwide collaboration

Experiment lab for open data cycles

Right moment in time





Maps4Science Motivation

- NL → one of the worlds' best-measured countries
 Great data sets: topo base map, AHN-2, geology, socio-economic,...
- However, geo-data use within academia is poor, reasons:
 - 1. Licence restrictions
 - 2. Technical inability to handle data types (3D, massive data,...)
 - 3. Lack of awareness
- Maps4Science goals:
 - 1. Production tool (geo-data storage, delivery, and services)
 - 2. Research topic itself





Time is right \rightarrow Content is becoming more available

- 'Verhagen plaatst open data hoog op Digitale Agenda', in Automatisering Gids by Rolf Zaal;
- 'Toepassing van de Wet openbaarheid van bestuur (in Dutch), brief van de Minister van BZK over Open Data bij de overheid;
- 'Toegang tot Onderzoeksdata', SURFshare report, Stichting SURF;
- INSPIRE and 'Basisregistraties' are will provide results;
- 'Een nationale satellietdatabank als horizontaal thema binnen de topsectoren!' (Nieuwsbericht' Min ELI, 04-10-2011);
- Min I&M stelt vanaf 1 januari 2012 de Basisregistratie Topografie gratis beschikbaar;
- 'OGC Plan for White Papers on NSF Earth Cube'.
- → No other GOF except generic ICT does support such a large amount of researchers





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Link to generic ICT GOF 'Building the e-Infrastructure'

René van Schaik (Netherlands eScience Center)
 discussion GOF-GOF connection to support Maps4Science needs:

'traditional' datasets of an estimated volume growth of 200 TB/year and 'non-traditional' datasets (such as sensor network data, VGI, LBS and other sources) of between 500 TB and 1000 TB/year resulting in a total storage (and processing) capability of 7 PB. Some important connections must be based on optical pathways to ensure fast and seamless access.

- 3. Netherlands eScience Center/ SURF Foundation/ SARA:
 - generic grid computing infrastructure (BiGGrid),
 - fast network connections and
 - substantial available data storage





Scientist different than 'normal' user? (of Gov geo-service or Google Earth)

- 1. Looking for unexpected relationships (more strange data combi's)
- 2. More interested in source measurements (reinterpretations)
- 3. Large areas/regions of interest, more data, discovering patterns
- 4. Producing more own data (from measurements, computations)
- 5. More requiring w.r.t. 3D and temporal (not only 'now') support
- 6. Wanting to share geo-processing chains
- 7. Non geo-info professional (medicine, history, economics, etc.)
- \rightarrow Answer: yes (and no)
- → Same ease of use, but with much more types of data and services huge challenge...



Living Lab

- Collaboration with Public and Private sector: golden triangle
- Development must take place in real world (virtual) environment
- Cross-over environment, involving all stakeholders
- Real world applications
- Open environment (OGC testbed-like)

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Partners

- 1. Technische Universiteit Delft, Prof. dr. ir. Peter van Oosterom
- 2. Alterra, Ir. Jandirk Bulens
- 3. Data Archiving and Networked Services (DANS), Dr. Peter Doorn
- 4. Geonovum, Drs. Rob van de Velde
- 5. NLR, Dr. Rob van Swol
- 6. Universiteit van Amsterdam, Prof. dr. Tom van Engers
- 7. Universiteit Twente, ITC, Dr. ir. Rolf de By
- 8. Universiteit Utrecht, Prof. dr. Steven de Jong
- 9. Vrije Universiteit Amsterdam/EduGIS, Prof. dr. Joop v/d Schee
- 10. Wageningen Universiteit, Prof. dr. ir. Arnold Bregt



Various local 'geo-desks' NL Univ's

1. Different status/phases

- UU geo-loket
- Special map collections WUR library
- GeoDesk Alterra
- Geo data warehouse UT/ITC
- TUD kaartenkamer/ TUD Maps
- VU Geoplaza
- 2. Different locations within organizations: central/library, faculty/dept
- 3. Overlapping activities (data/services) and all having more ambitions
- 4. With KB and DANS in joint platform 'UKB werkgroep kaarten en GIS' DANS=Data Archiving & Networked Services, Institute KNAW/NWO





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Supporters national (1/3)

red = new after 31 aug'11

- SURF, Prof. dr. W.B.G. Liebrand
- Netherlands eScience Centre, Prof. dr. Jacob de Vlieg
- Kadaster, Dr. ir. M.A. Salzmann
- TNO | Geological Survey of the Netherlands, Dr. M.J. v/d Meulen
- KNMI, Royal Netherlands Meteorological Institute, Dr. G.H.J. v Oord
- RWS-DID, Rijkswaterstaat, Data-ICT-Dienst, Ir. Arie Versluis, MBA
- AHN Programme, Ir. R. van der Velden
- Het Waterschapshuis, Drs. J.W.A. van Enst
- The Hydrographic Office (Def), Kortenoeven, Kapitein ter Zee
- PBL Netherlands Environmental Assessment Agency, Ir. R. v/d Berg
- Netherlands Space Office, Dr. G. Nieuwpoort
- Geo Business Nederland, Drs. E.H.T.M. Nijpels
- Geomatica Business Park, Prof. ir. J. Stuip
- Noldus Information Technology, Dr. L.P.J.J. Noldus





Supporters national (2/3)

- KNAW-NCG, Netherlands Geodetic Commission, Prof. dr. ir. M. Molenaar
- GeoFort, Drs. Willemijn Simon van Leeuwen
- Next Generation Infrastructures, Prof. dr. ir. M.P.C. Weijnen
- Stichting Arbeidsmarkt Geo, H. Westerbeek, MSc
- ICT Innovation Platform for Geo-information, Ir. Th. Thewessen
- Ministry of Infrastructure and the Environment (I&M), Drs. H.W.J. Ovink
- Ministry of Economic Affairs, Agriculture and Innovation (ELI), Drs. J. Gooijer
- DataLand, Ir. M. Jellema
- Statistics Netherlands (CBS), Drs. W. van Nunspeet
- NMDC (National Model and Data Centre), Ir. W.J. Nieuwenhuizen
- Deltares, confirmed
- Publieke Dienstverlening op de Kaart (PDOK), confirmed





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Supporters international (3/3)

- OGC, Open Geospatial Consortium, Mark E. Reichardt
- Geoide Network, Canada, Prof. dr. Nicholas Chrisman
- CRC-SI, Cooperative Research Centre for Spatial Information, Australia, Dr. Peter Woodgate
- KU Leuven, Instituut voor de overheid, Dr. Joep Crompvoets
- ISO/TC 211 Geographic information/Geomatics, Olaf Østensen
- EuroSDR, Jean-Philippe Lagrange
- EDINA, UK National Data Centre (Uni Edinburgh), Peter Burnhill
- GSDI, Global Spatial Data Infrastructure Ass, Dr. Abbas Rajabifard
- AGILE, Danny Vandenbroucke, MSc
- EuroGeographics, Dave Lovell, OBE FRGS CGeog
- Oracle, James K. Steiner
- Esri, USA, Jack Dangermond
- Google, confirmed
- Microsoft, confirmed





Maps4Sience 2nd in world after UK (and parallel with USA)

- EDINA, the only similar facility (http://edina.ac.uk):
 - National academic data centre, 1995 designated by JISC (UK's information&digital technologies expert for education&research)
 - Funded by JISC, research councils (ESRC, NERC), and Universities
 - Annual assessment, business plan and update strategic plan
 - Hosted by University of Edinburgh with the University Data Library
- EDINA organization: management (9), data library (5), administration (4), user support (14), service delivery (50= bibliographic&multimedia 22 + research&geodata 27 + learning&teaching 1), IT infrastructure (8), Warrington office (3)
- Differences: more centralized, less as research topic itself
- USA/NSF has now call of the 'Earth Cube'

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Instead of local facilities towards a national facility, phases



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Architecture (linked data provisions)



Our 4 science cases

- 1. Geo-Information Science case: 9 GI research topic
- 2. Science with geo-information case: 6 domains
- 3. Spatial Cyberinfrastructure science case
- 4. Digital rights management science case





Scientific breakthroughs (1): GI-science itself

- Create best GII (geoweb)
 - 1. Architecture, resources and standards;
 - 2. Usability and dissemination modes;
 - 3. Management of very large data sets;
 - 4. Semantics of GI;
 - 5. Services, searches and optimization;
 - 6. Standardized data models and data quality;
 - 7. Volunteered GI and citizen science;
 - 8. GII-assessment;

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9. Satellites as a service.



Scientific breakthroughs (2): Annex B science cases using geo-data

- Health: Measuring and Forecasting the Spread of Epidemics Prof. dr. Peter Sloot (UvA)
- Water resources: Better management through geo-information Prof. dr. ir. Nick van der Giesen (TUD)
- Crime: Geo-information and GI-Science as Crime reduction tools
 Prof. dr. Marianne Junger (UT)
- Agriculture: Avian Influenza Don't spread the disease Ir. Henk Janssen, WUR;
- Cultural history: The Integrating Heritage Program
 Prof. dr. Jan Kolen, Prof. dr. Henk Scholten (VU)
- GNSS performance: Support mission-critical applications by predicting GNSS performance

Drs. Judith van Bruggen-van Putten (NLR)





Body	Composition	Responsibility	
Board	Partners; mix of Directors of Libraries and Institutes 2x year	 Strategic decisions; determines annual and financial report and long term and yearly work plan Responsible to funding agencies 	
NAP	Representation of intended users from Science (profs), Government/Business directors (users/data suppliers) and top-level GI/ICT profs; E.g. Kadaster, NCG, GBN, IPN; 2x year	 Strategic advise Approves on yearly working plan Monitors progress 	
IAP	Representation of prominent, experienced researchers from international research organizations and business, e.g. Edina, JRC, GSDI, NofN, OGC, Oracle, Google; 1x year	 Strategic advise Review Advise in international matters (cooperation, harmonization,) 	
Directors	Director of Science (TUD) Director of Infrastructure (TUD Library) Director of Living Lab (IIP-Geo) 1x month	 Secretary of the board Responsible for realizing M4S Facility (final responsibility is within the board) Daily management 	



Business case

- Libraries actively involved
- Partners contribute where possible (data, experience, software...)
- No doubling of activities, developments
- Central coordination TU Delft (standardization)
- Hardware decisions not too early (and phased), due to lower prices in the future zo
- Lean en mean Maps4Science support bureau
- Two years of development for (first version) Maps4Science Facility
- Five years of production of new facility (continuous improvements)
- Existing (local) facilities are first two years called Maps4Science
- Next few weeks, more detailed program (who does what)



M4S Business case

Bloc k	Work packages	M€	Partners
Infrastructure	Spatial CyberInfrastructure R&D DRM R&D GII Personnel Housing & office & communication Transition (decommissioning) Maintenance Evaluation and improvements Customisation to educational needs <i>Subtotal</i>	2,8 1,0 1,0 3,9 0,6 0,6 3,0 1,2 1,2 1,2 15,3	TUD, UT, DANS, VU, WU, UU, Geonovum, NLR UvA, TUD, DANS, WU, Geonovum, Alterra TUD, UT, WU, Geonovum, Alterra, NLR TUD, IIPGEO TUD, IIPGEO TUD, UT, DANS, VU, WU, UU, Geonovum TUD, UT TUD, UT, VU, UvA TUD, UT, VU, UvA
Scien ce	GII Science case Scientific use cases Subtotal	4,2 1,9 6,1	TUD, UT, WU TUD, UT, UvA, WU, VU, NLR
Living Lab	Testbed facility, Live city lab, Layar visualisation, Multiscale & Gaming simulation	1,4	IIPGeo, TUD, Geonovum, GBN, NCG, SAGEO, (Business and Government partners)
Total		22,8	



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Future (after the 2+5 years) project

- Currently, all project partners spend resources (staff, money) on local facilities (already for many decades)
- Boards (rectors, deans, directors) have indicated to provide at least 25% own funding during live time project
- Use of facility should be well proven during lifetime project

→ Partners (and supporters) will continue with facility after project in most appropriate embedding (TUD Library, DANS, SURF,...)



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"Doctor, take your own medicine..."

- (nearly) all scientists need geo-information, not only the georelated disciplines (but also archaeology, epidemiology, engineering, social sciences, etc.) → data intensive science
- Proposal for large national research facility: Maps4Science (2+5 years project, 22.8 meuro)
- Dutch geo-data provides support
- Node in international network; e.g. EDINA
- Make best GII: 3D/time/scale, semantics, upload, large data, remote processing, data policy
 → www.maps4science.nl



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25

INSPIRE Themes (annex I and II)

Annex I:

- •Coordinate reference systems
- •Geographical grid systems
- •Geographical names
- Administrative units
- •Addresses
- •Cadastral parcels
- •Transport networks (road, water,..)
- •Hydrography
- •Protected sites

Annex II:

Elevation
Land cover
Orthoimagery
Geology (aquifiers,..)





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INPSIRE Themes (annex III)

- Statistical units
- •Buildings
- •Soil
- •Land use
- •Human health and safety
- •Utility and Government services (water supply, sewage,..)
- Environmental monitoring facilities
 Production and industrial facilities (water abstraction,..)
- •Agricultural and aquaculture facilities
- •Population distribution demography

- •Area management/restriction/ regulation zones & reporting units (areas around drinking water,..)
- Natural risk zones
- Atmospheric conditions
- •Meteorological geographical features
- •Oceanographic geographical features
- •Sea regions
- •Bio-geographical regions
- •Habitats and biotopes
- •Species distribution
- •Energy resources
- •Mineral resources





Spatial data examples (EduGIS maps)

Open street map



















Zoek een adres

