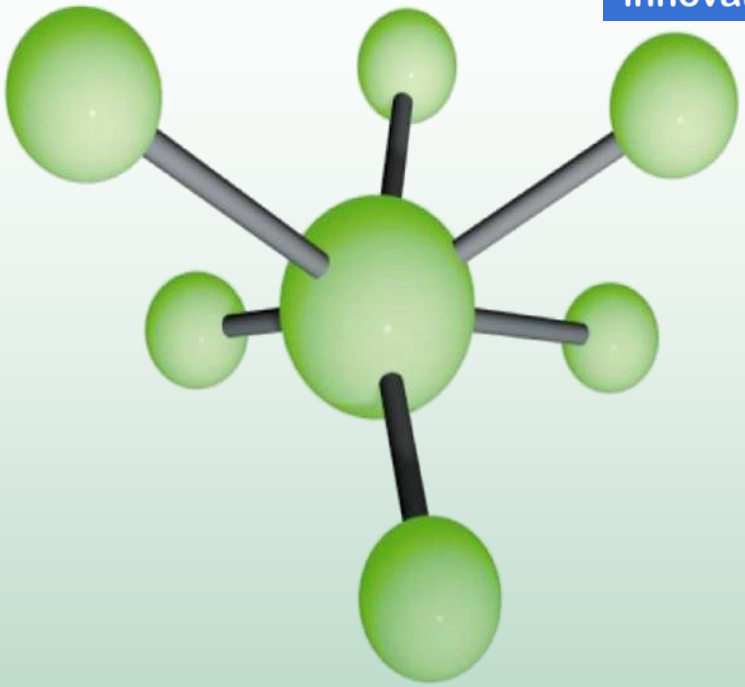


S@NY

Sensors Anywhere

FP6-033564

Adding Value to Geospatial Data with SensorSA Fusion Services

Final SANY Event, Linz, 19 November 2009

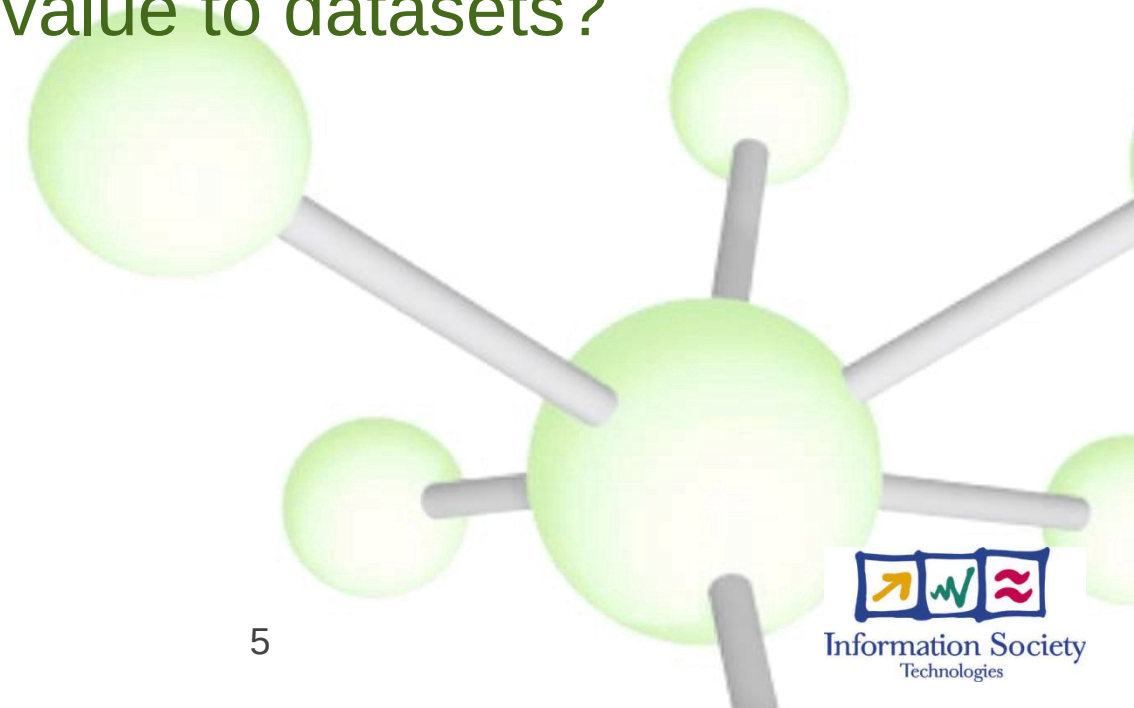
Stuart E. Middleton

IT Innovation Centre, University of Southampton

Question

What is data fusion?

How does it add value to datasets?

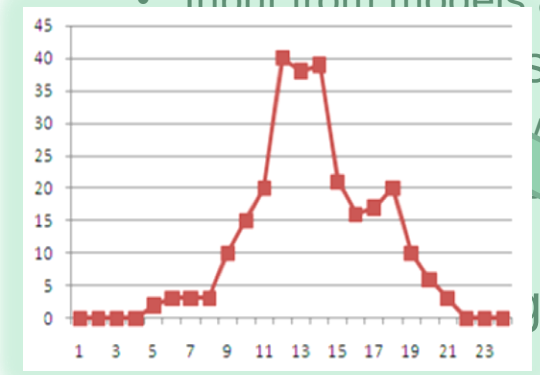


Outline of presentation

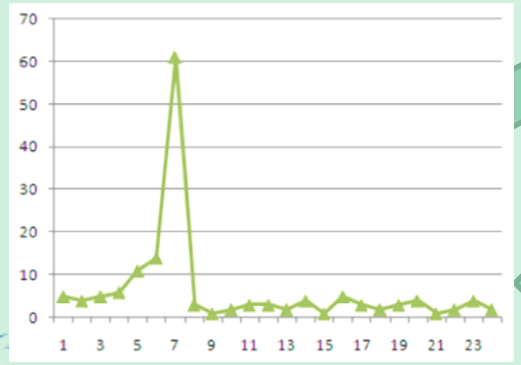
- Data fusion [3]
  - What is data fusion?
  - Value proposition for data fusion
  - What is generic data fusion?
- OGC standards and SANY fusion services [1]
  - How can the OGC standards help us?
- Fusion services [2]
  - How does a fusion service work?
  - Visualization
- Summary

Data fusion (1/3)

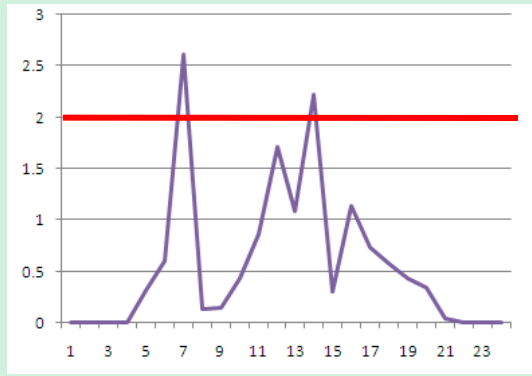
- What is data fusion?
  - Fusion of multiple data sources
    - Integration of data sources
    - Inference of new data from existing sources
    - Input from models as well as raw data



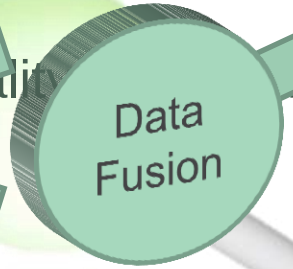
Beach attendance / day



Microbial contamination / day



Impact assessment
>> close beach? <<



Data fusion (2/3)

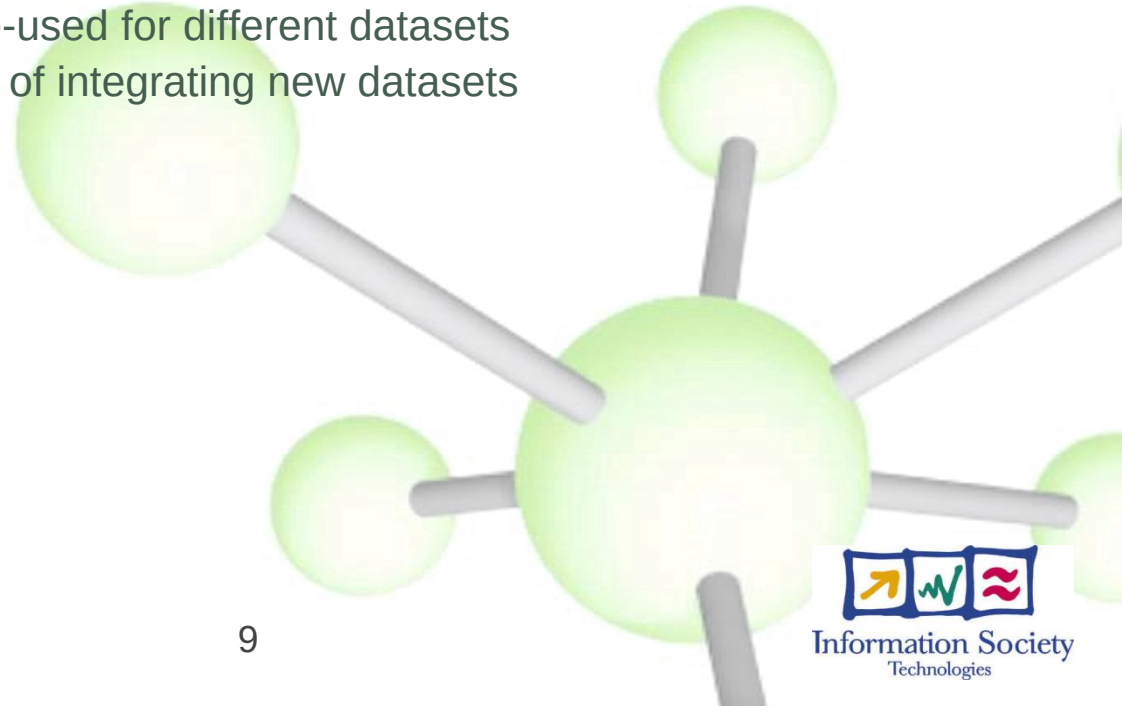
- Value proposition
  - Fusion techniques add value to existing data
  - Knowledge squared value proposition
    - The whole is larger than the sum of the parts

- Examples of adding value in SANY
  - Spatial fusion
    - Data : ground displacement measurements [Dresden]
    - Value: interpolation over whole areas
  - Temporal fusion
    - Data: historical water salinity measurements [Falmouth]
    - Value: prediction of future salinity values
  - Data modelling
    - Data: air pollution measurements [Linz]
    - Value: state space model of stochastic trends and daily cycles of NO_2

Data fusion (3/3)

- What about generic data fusion?
  - We are developing generic fusion techniques within SANY
  - Separating the configuration and data from the algorithm itself
  - Automating fusion pre-processing using O&M metadata

  - ***Why?***
    - Lowers the cost of developing fusion algorithms
    - Same algorithm can be re-used for different datasets
    - Plug and play lowers cost of integrating new datasets

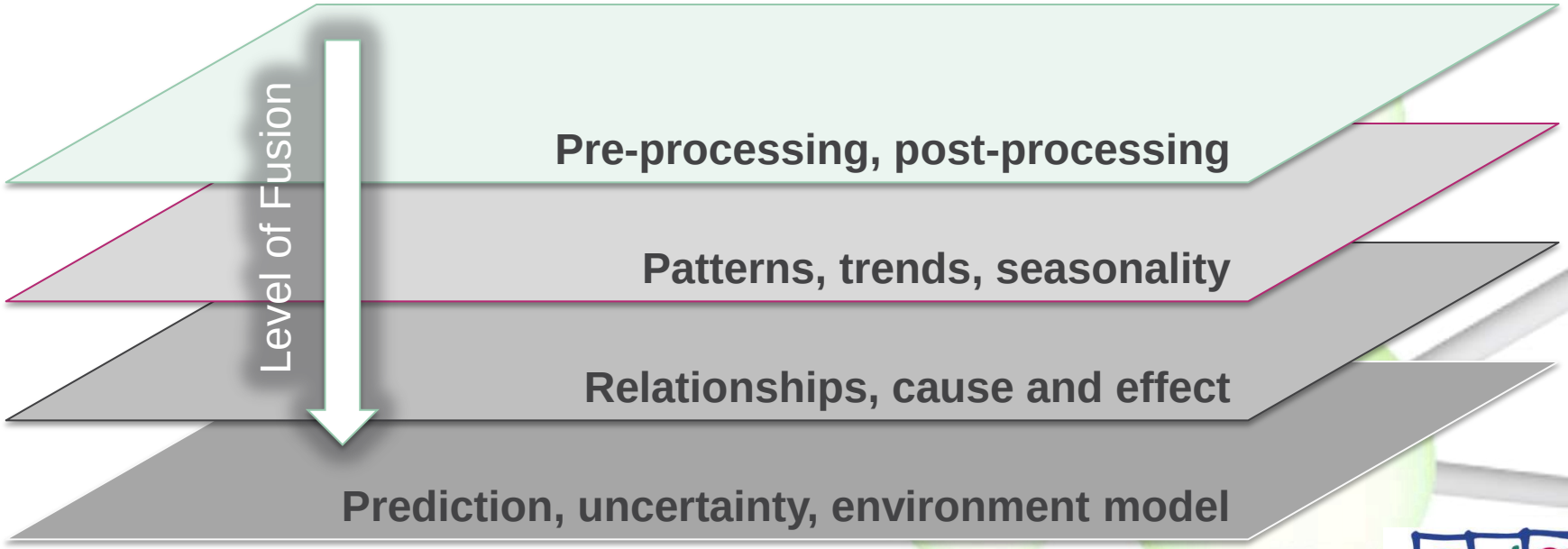


OGC standards and SANY fusion services (1/1)

- How can the OGC standards help us?
  - Open Geospatial Consortium (OGC)
    - http://www.opengeospatial.org/
  - Processing protocols
    - Web Processing Standard (WPS)
    - Sensor Planning Service (SPS)
  - Data syntax
    - Observation & Measurement (O&M)
  - ***Why?***
    - Standard interfaces lowers the cost of integrating third party software

Fusion services (1/2)

- How does a fusion service work?
  - Pre-processing
    - data aggregation, syntax checking etc
  - Fusion processing at different levels
  - Post-processing
    - Result formatting, storage on external servers etc



Profiles make fusion setup easier

- Choose property : NO_2, O_3, Cloud Cover, Wind, Air Temperature etc
- Setup algorithm params : Lag, Sill, Nugget etc (or use defaults)
- Run the fusion service

SANY : Spatial, Temporal, Spatial-temporal, Causal correlation

Information Society Technologies

Summary

- Data fusion
  - Adds value to your data
    - Aggregation, interpolation, prediction
  - Generic fusion lowers costs
    - Algorithm reuse
    - Dataset plug and play
- OGC standards and SANY fusion services
  - Standards reduce cost of integration of third party software
- Fusion services
  - SANY provides support for different levels of fusion
  - Visualization of results using third party tools

SEE THE DEMO

Thanks for your attention

More information and downloads on

SANY-IP.EU web site!

IT Innovation Centre

University of Southampton

Dr Stuart E. Middleton

sem@it-innovation.soton.ac.uk

www.it-innovation.soton.ac.uk