

Ruimte voor **Geo-Informatie**



*RGI-189*

**Project:  
Gestandaardiseerde output van Sensoren  
op het Internet.**

**Workshop Testopstelling**

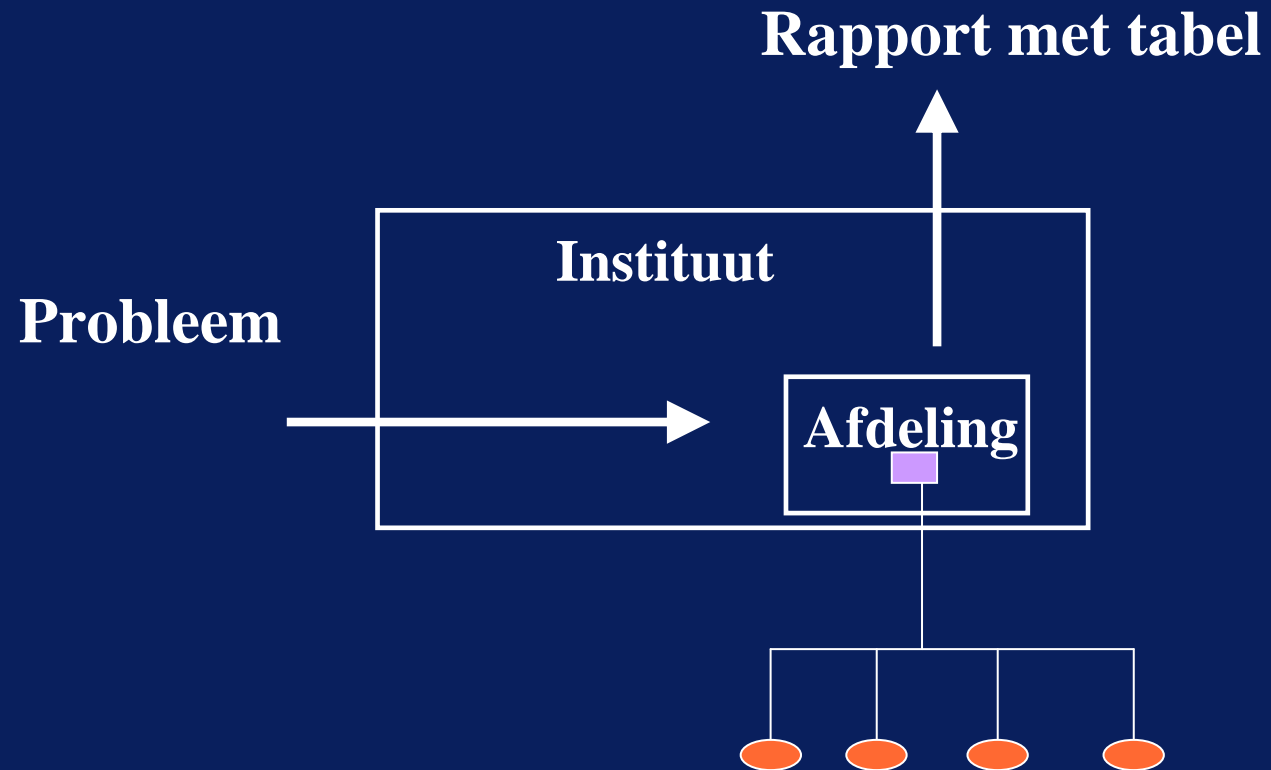
Jan Jellema

TNO

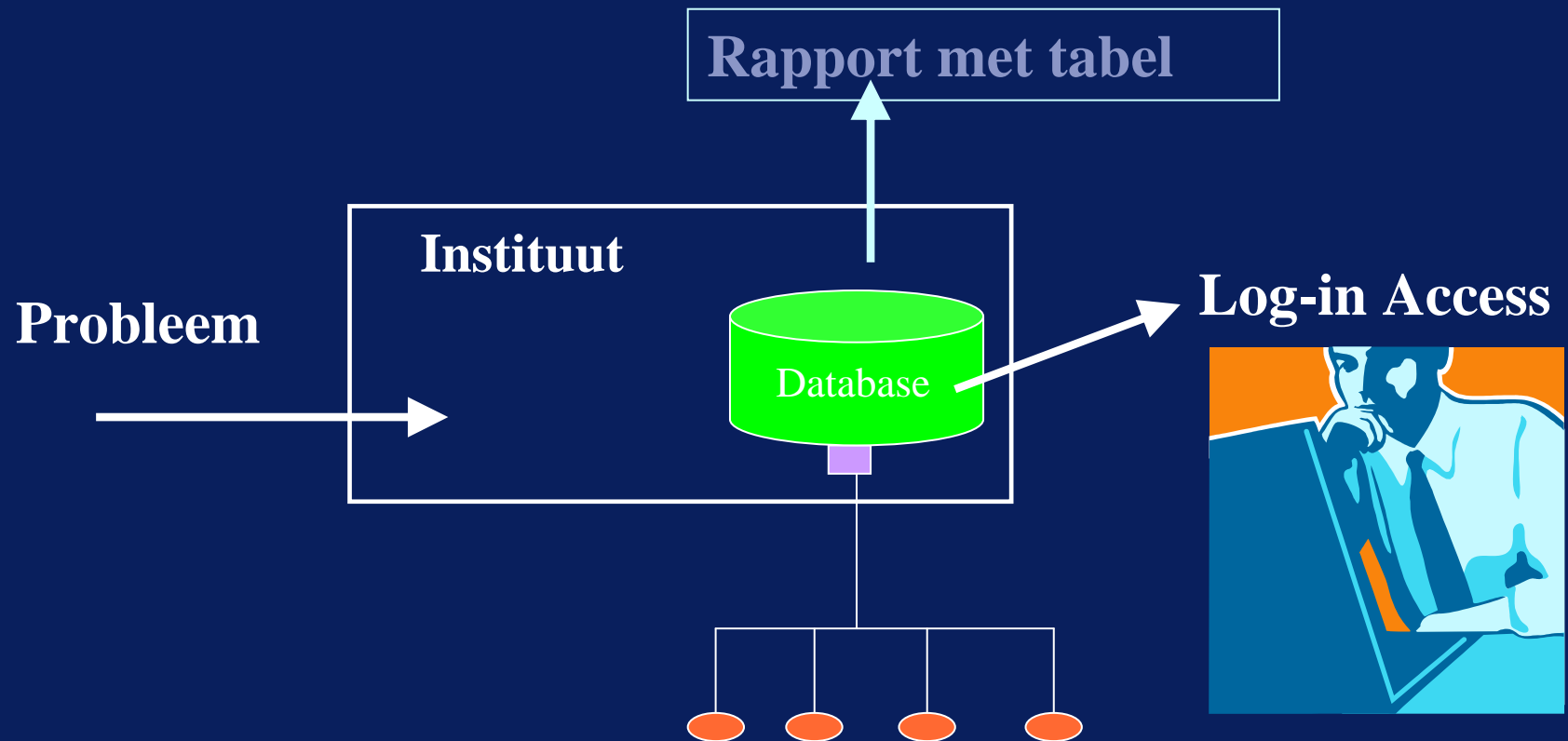
# Partners

- **KPN** National Telecommunications
- **LOFAR** Super fast scientific fibre network
- **KNMI** Royal Netherlands Meteorology Institute
- **WUR** Agricultural University Wageningen
- **Alterra** Agricultural Scientific Institute
- **Delft Hydr.** Delft Hydraulical laboratory
- **GeoDelft** Centre for Geo-Engineering
- **Eijkelkamp** Producer of environmental and groundwater sensors.
- **TNO B&O** Build environment and geosciences;  
Geological Survey of the Netherlands
- **IFGI** The Institute for Geo-Informatics

# Vroeger

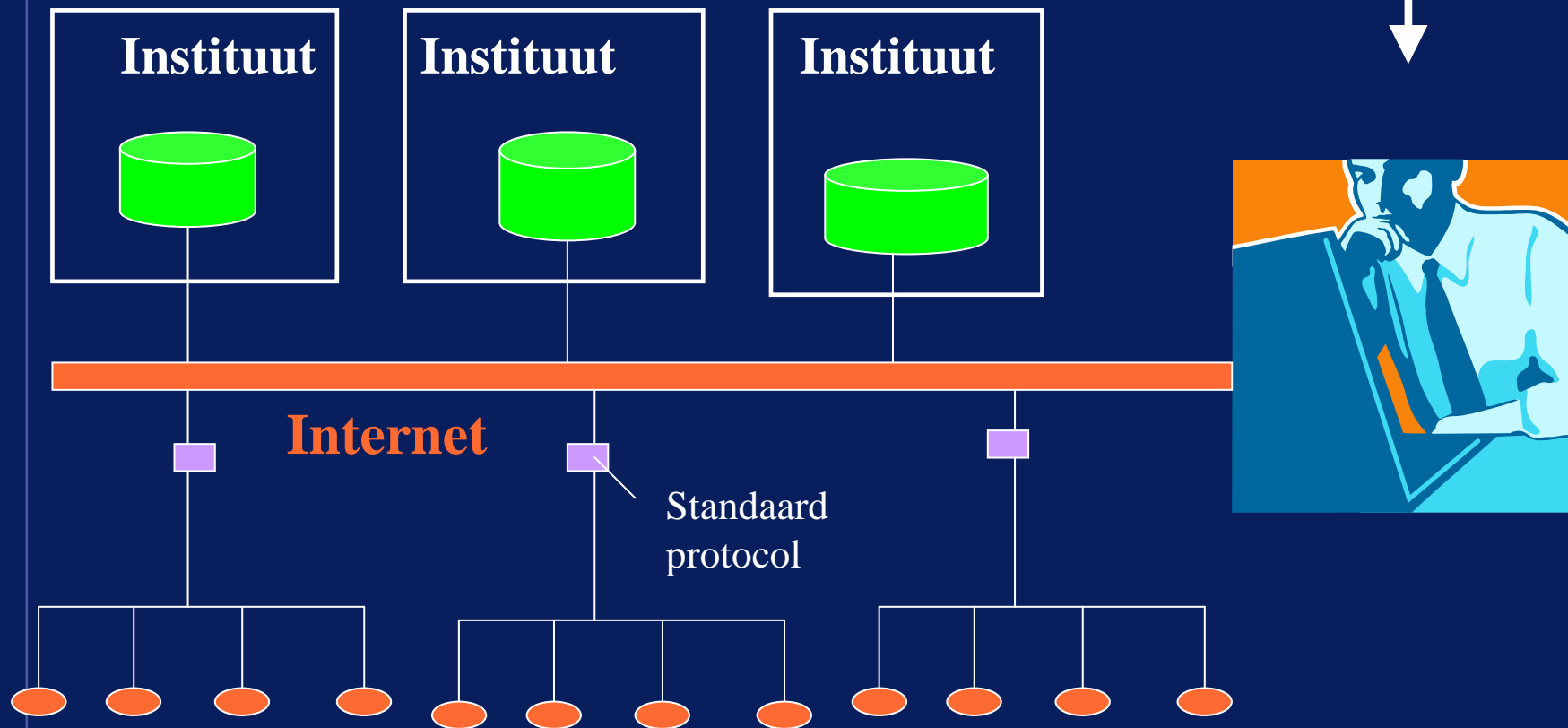


# Tegenwoordig



# Toekomst

Probleem



# Voorbeeld verdroging akker



**1. Bodemvocht**

**Meerdere plaatsen**

**2. Neerslag**

**locaal**

**3. Neerslag  
Verwacht  
Hydroline**

# Voorbeeld Aanvraag Berekening



## Grondwaterstanden

- Recent uit sensoren
- Vorige jaren

## Inlaat

- peilen debieten
- Kanaal Stuwen

## Neerslag/Verdamping

- Recent uit sensoren
- Afgelopen maanden

# Voorbeeld Staatsbosbeheer



**Grondwaterstand**

**Locale neerslag**

**Lucht kwaliteit**

**Actueel**

**Gr.water kwaliteit**

# Voorbeeld Staatsbosbeheer



**Grondwaterstand  
In brandputten**

**Brandbaar  
Materiaal**

**Lucht vervuiling  
door rook**

# Voorbeeld Hoog water



Rivier standen



# Voorbeeld Hoog water



**rivier  
standen**

**Grondwaterstand  
In kwelgebied**

**polderafvoer**



# Polder bij Lent




# **Voordelen van Sensor informatie op het Internet**

- **Betere samenwerking tussen instituten.**
- **Geinformeerde burgers (Aarhus).**
- **Real-time ondersteuning van beslissingen.**

# Starting points

- **General technical requirements by TNO**
- **Requirements Demonstration by Alterra/WUR**
- **Test-area “Rivierenland”**
- **Content aspects by Alterra, WL, GeoDelft, TNO, RWS, Rivierenland and KNMI**
- **Data Communication by KPN and Lofar**
- **Sensors and practical support by Eijkelkamp**
- **SWE specs and introduction by IFGI**

# Planning

	2006	2007	2008
WP1			
WP2			
WP3			
WP4			
WP5			
WP6			
WP7			
WP8			





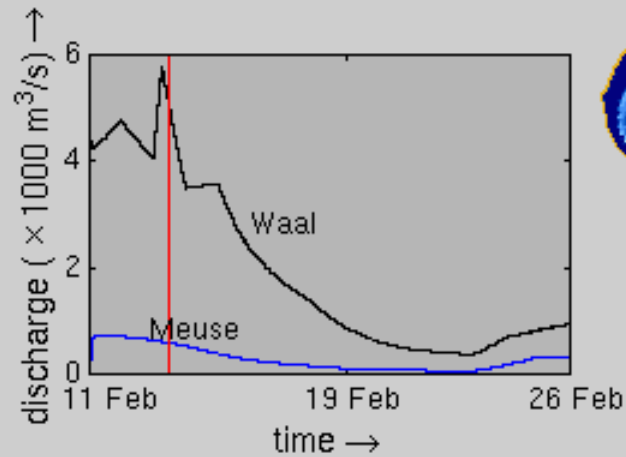
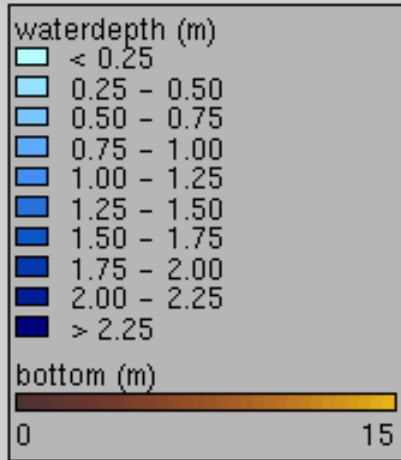
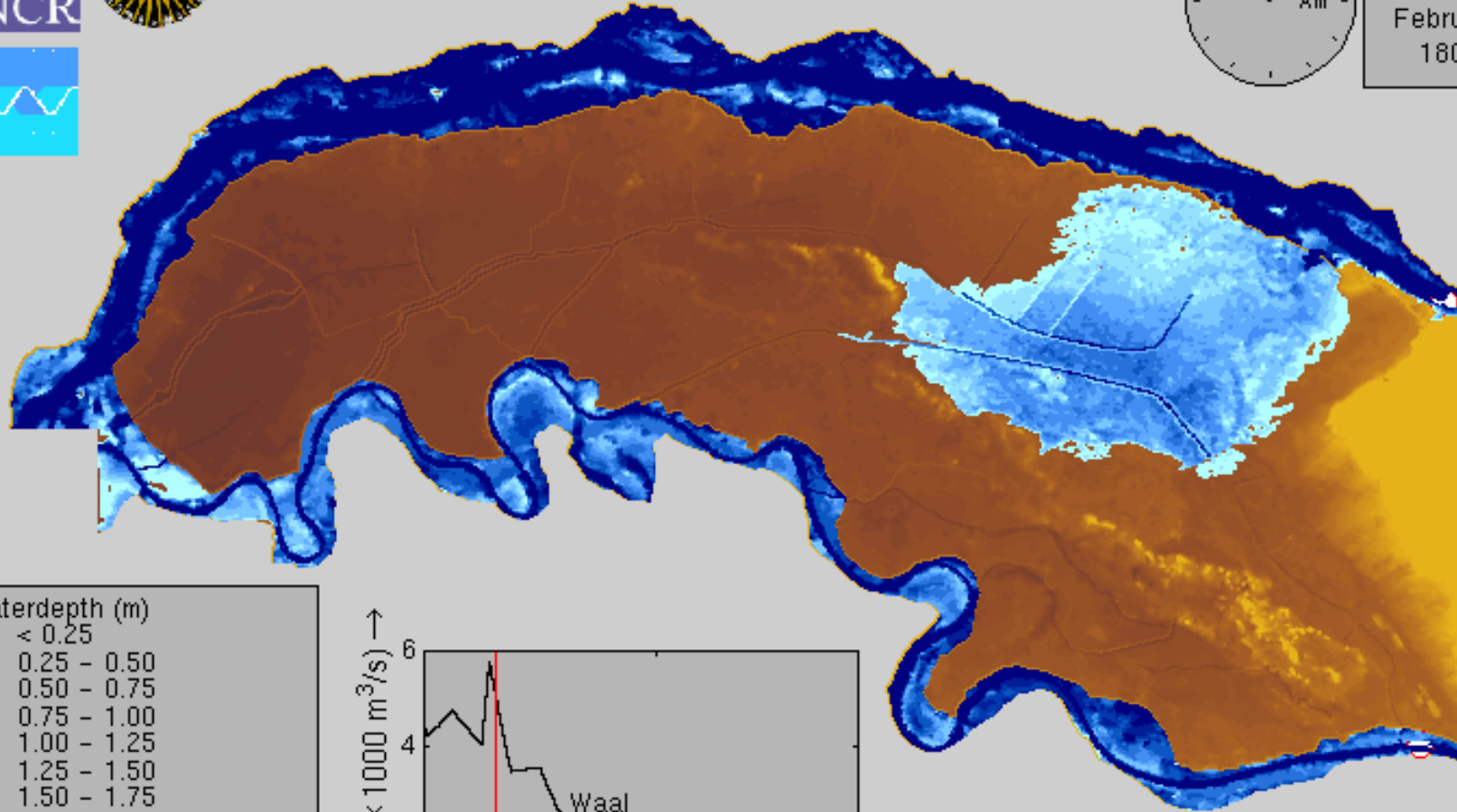


# THE FLOOD OF 1805

Flooding of the polder 'Land van Maas en Waal', The Netherlands



Wednesday  
**13**  
February  
1805



Annika W. Hesselink

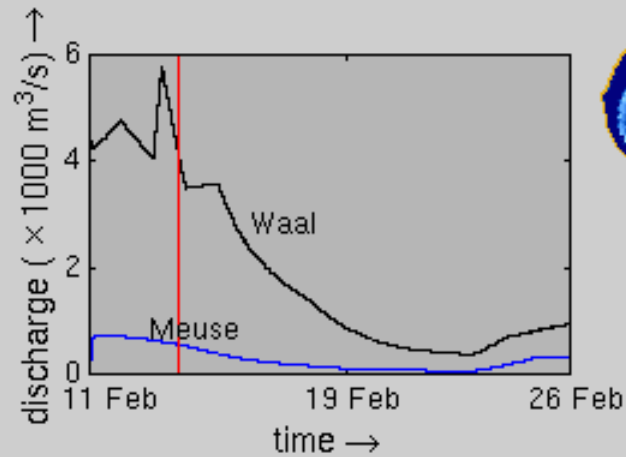
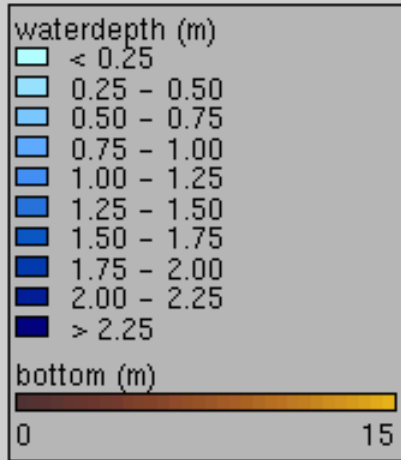
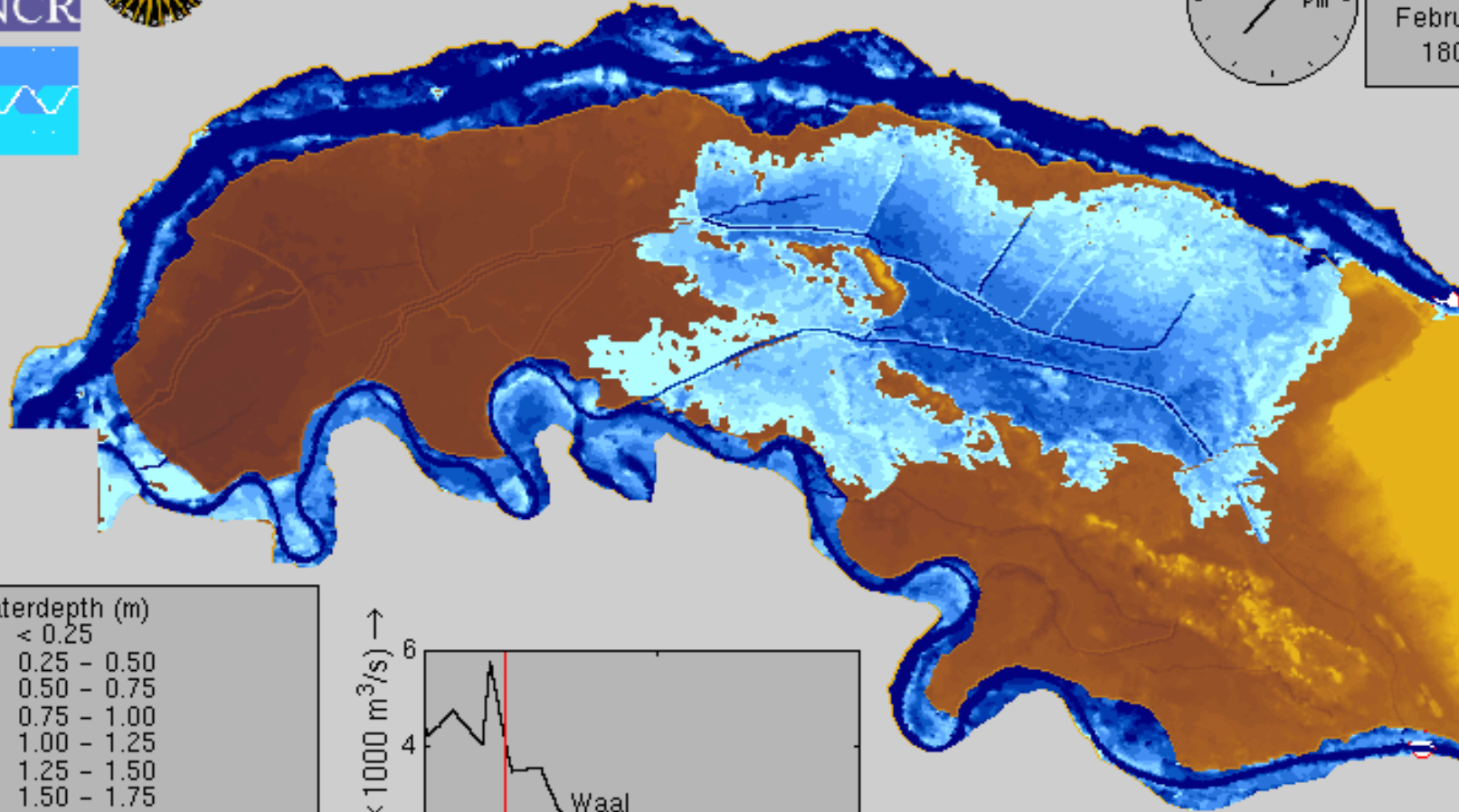


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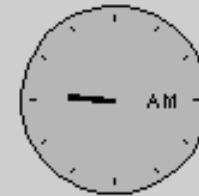


Annika W. Hesselink

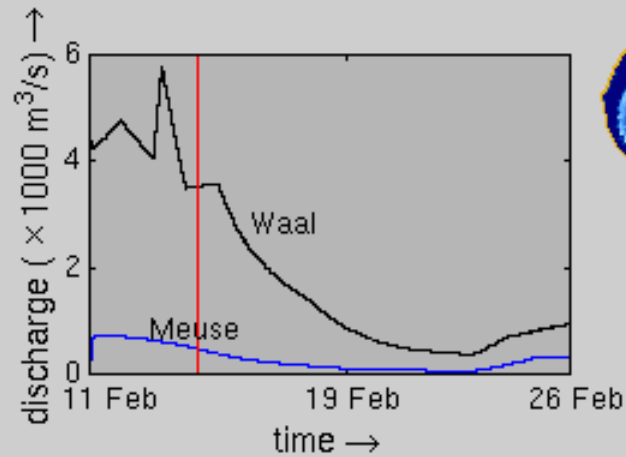
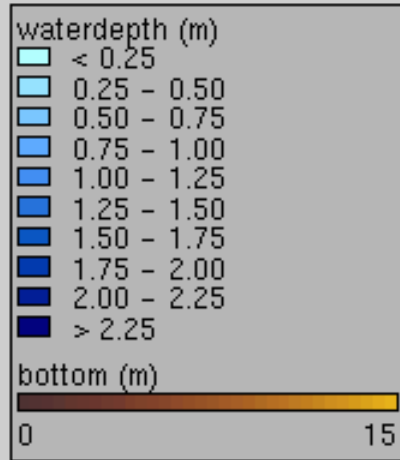
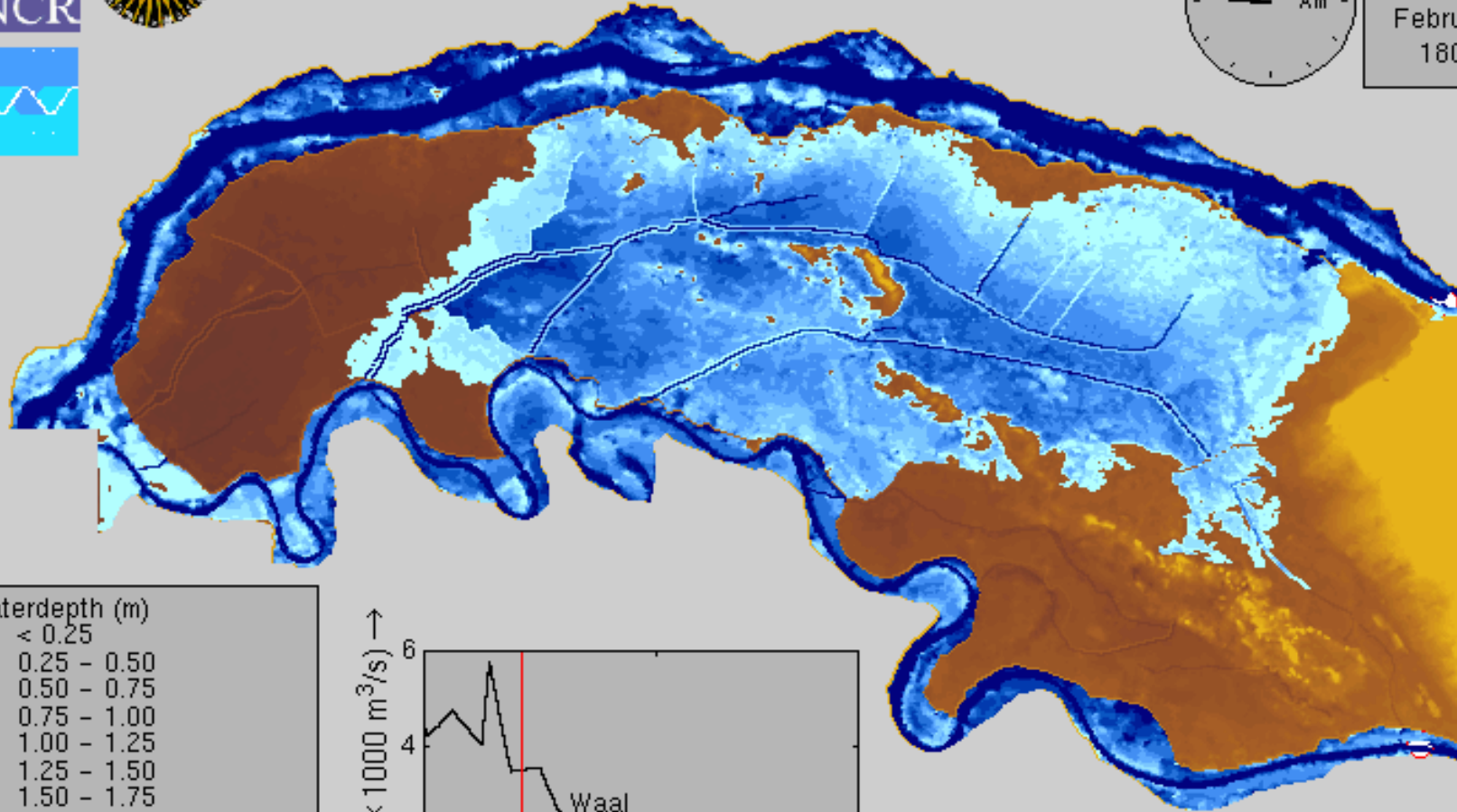


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February  
1805



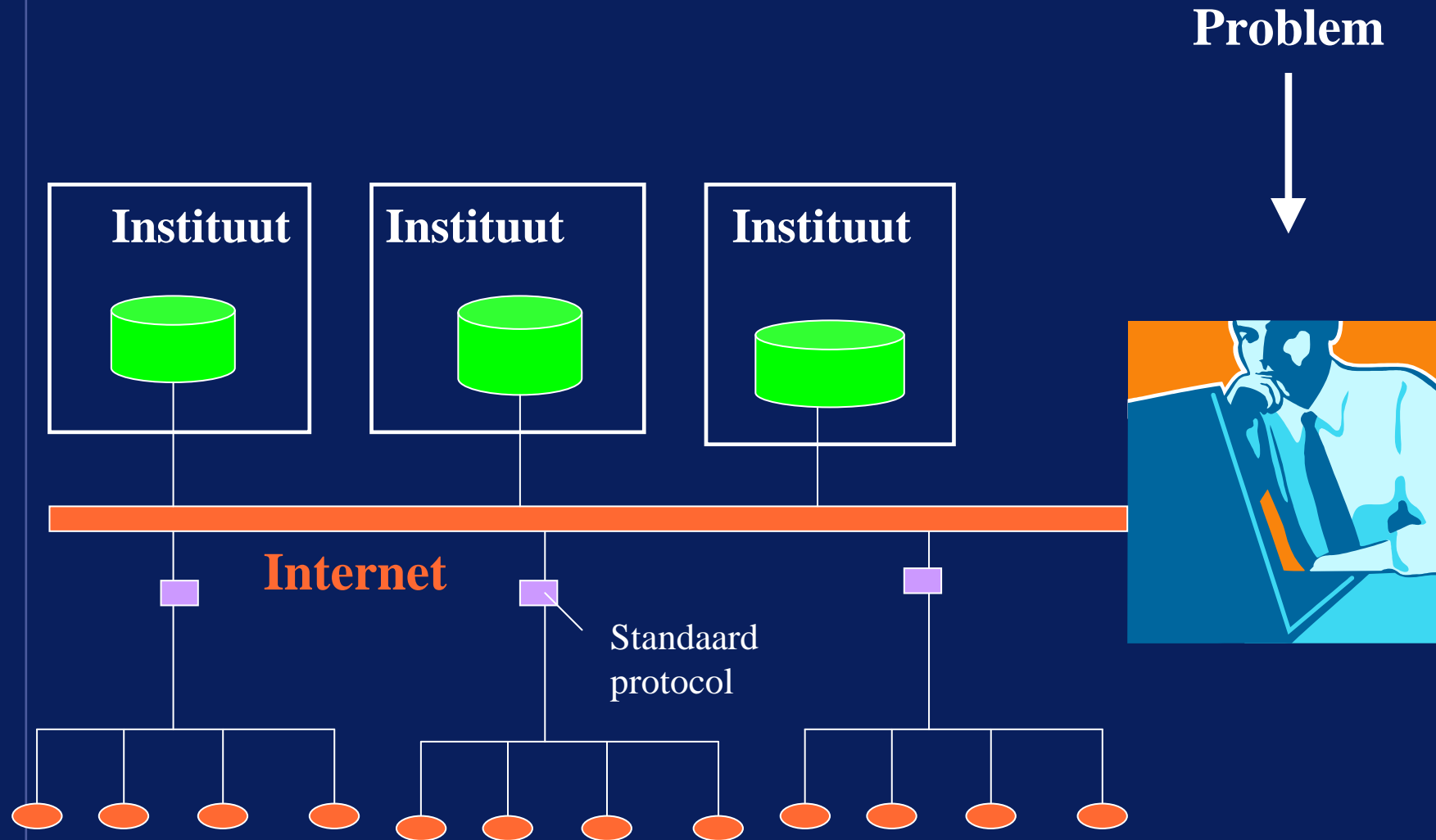
Annika W. Hesselink

# Sensor Web Enablement



- **Search through the Internet.  
Find the metadata and location of the sensor**
- **Contact the sensor and ask for recent (meta)parameters**
- **Define a selection or pre-process the data**
- **Receive the selection or request for periodic updates**
- **Search for and apply standard processes on received data.**

# Toekomst



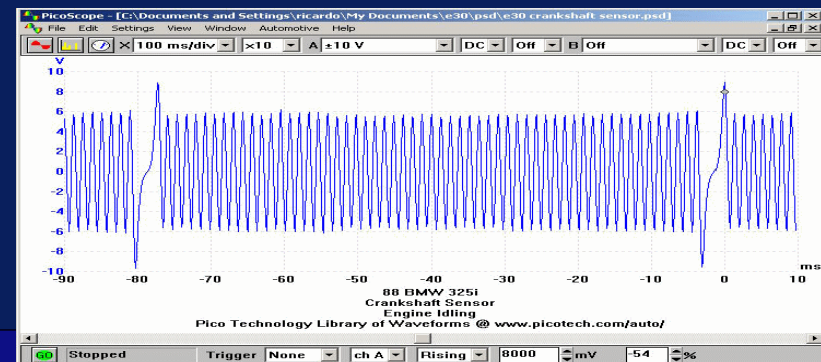
- **1. Sensor Model Language (SensorML)** – The general models and XML encodings for sensors. SensorML originated under OWS 1.1, was significantly enhanced under OWS 1.2 and is now available as a public discussion paper.
- **2. Observations & Measurements (O&M)** - The general models and XML encodings for sensor observations and measurements. O&M originated under OWS 1.1 and was significantly enhanced under OWS 1.2.
- **3. Sensor Observation Service (SOS)** – A service by which a client can obtain observations from one or more sensors/platforms (can be of mixed sensor/platform types). Clients can also obtain information that describes the associated sensors and platforms. This service originated under OWS 1.1 and was significantly enhanced under OWS 1.2.
- **4. Sensor Planning Service (SPS)** – A service by which a client can determine collection feasibility for a desired set of collection requests for one or more mobile sensors/platforms, or a client may submit collection requests directly to these sensors/platforms. This service was defined under OWS 1.2.
- **5. Web Notification Service (WNS)** – A service by which a client may conduct asynchronous dialogues (message interchanges) with one or more other services. This service is useful when many collaborating services are required to satisfy a client request, and/or when significant delays are involved in satisfying the request. This service was defined under OWS 1.2 in support of SPS operations. WNS has broad applicability in many such multi-service applications.

# WorkPackages

- |  |                    |
|--|--------------------|
| <b>1. Framework for the use of SWE</b>                           | <b>TNO</b>         |
| <b>2. Define and elaborate the experiments</b>                   | <b>WUR</b>         |
| <b>3. Combine archived data with new actual data</b>             | <b>LOFAR/TNO</b>   |
| <b>4. SWE in eco-hydrological research</b>                       | <b>WUR</b>         |
| <b>5. SWE in flood warning and operational water management.</b> | <b>Delft Hydr.</b> |
| <b>6. SWE in meteorological observation systems</b>              | <b>KNMI</b>        |
| <b>7. Dike observation in "Rivierenland"</b>                     | <b>GeoDelft</b>    |
| <b>8. The business case</b>                                      | <b>KPN/Lofar</b>   |
| <b>9. Project management and communication.</b>                  | <b>TNO</b>         |

# Questions?

- High-volume measurement data?
- Where is the selection/preprocessing done?
- Property rights owner? Confidential data? Responsibility quality? Validation is missing, Scale:local? Machine-ready?
- Different types of sensors, Power-supply, Data-communication to Internet?
- Who is paying for every step in the measurement and data transfer.

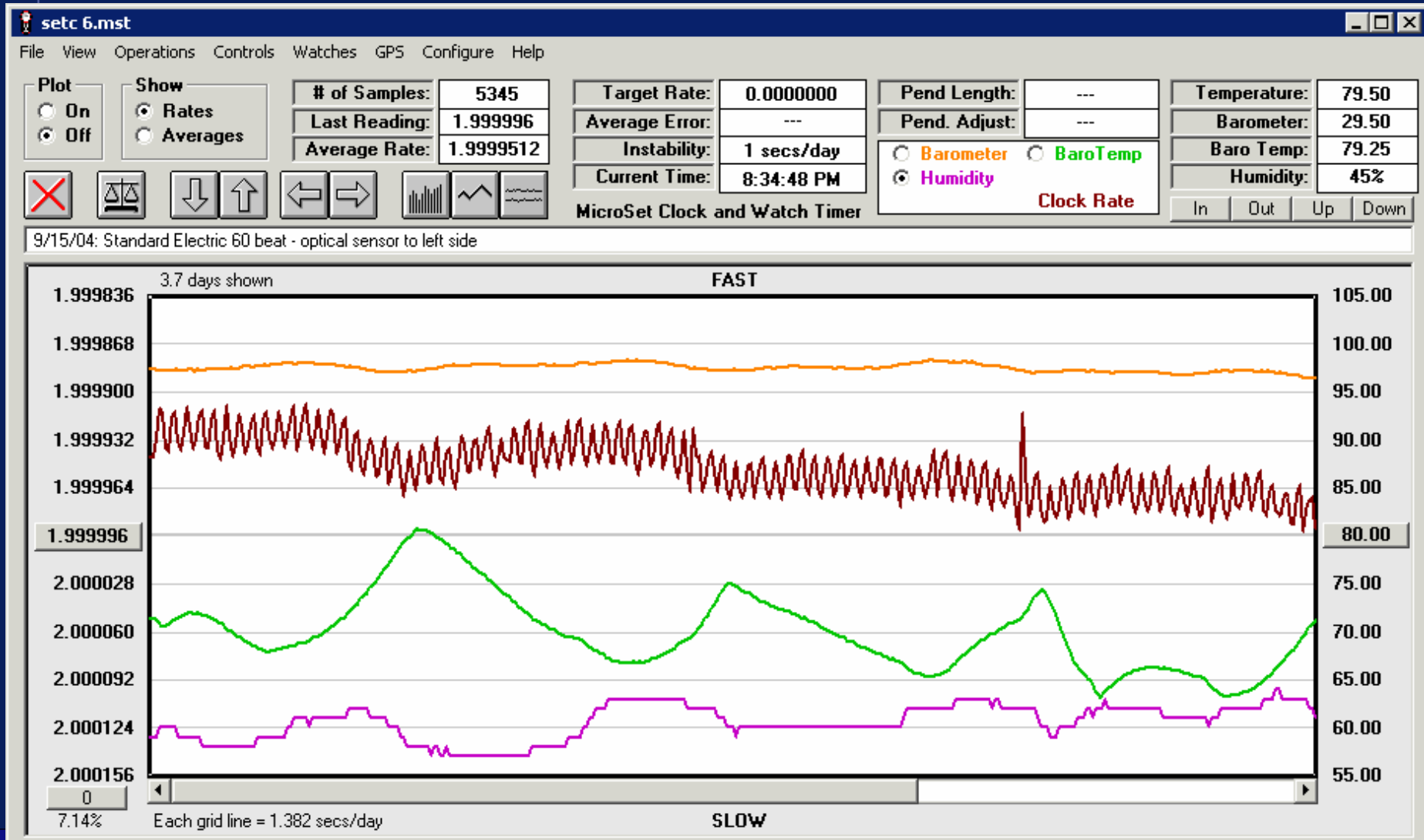


## **WorkPackage 1**

# **Framework and protocols**

- **Optimum approach between several disciplines  
Expectations and requirements of partners should be inventoried and harmonized**
- **Locate and describe existing developments and experiences**
- **Define minimum on data, metadata and other parameters, necessary for common use, starting with OGC-proposals.**
- **Define general infrastructure, functionality, software and hardware.**
- **Recommend standard processes, graphical presentation and geographical presentation**

# End





# **Voordelen van Sensor informatie op het Internet**

- **Betere samenwerking tussen instituten**
- **Geinformeerde burgers (Aarhus)**
- **Real-time ondersteuning van beslissingen.**





# OpenGIS

- **OpenGIS-pilot: standaard niet compleet**
- **Verschillende implementaties vendors**
- **Standaard niet in belang van ESRI?**
- **AGI heeft gekozen voor open standaard en open source software?**
- **Hoe kunnen we dit verder ondersteunen of gebruiken?**
- **RGI = druk op verdere standaardisatie? Ook op organisaties als OGC en vendors?**

# Markets – Geophysical data

