



# bavAIRia

Europe's heart of aerospace  
and navigation

Manfred Schroeder  
Polar View Progress Meeting 9, Brussels, 18 January 2011

## bavAIRia e.V. is the organisation to manage the Bavarian aerospace and SatNav clusters

- bavAIRia is an organization funded by the **Bavarian State Government** to manage the clusters Aerospace and Satellite Navigation
- Founded in mid 2006 with 40 member organisations, bavAIRia currently have **150 member organisations**
- Dr. Martin Haunschild, President and CEO of bavAIRia, is the mandated coordinator for Aerospace and Satellite Navigation of the Bavarian Ministry of Economics



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bavAIRia brings together the stake holder groups industry, science and politics on a **neutral ground – the goal is to facilitate cooperation projects**

# Bavarian user forums bring together the actors from different stages of the value chain, resulting in creative ideas & projects

## BAVARIAN SATNAV SECTORS & USER FORUMS



3

Space Applix / ICT



4

Security



5

Robotics



6

Transport



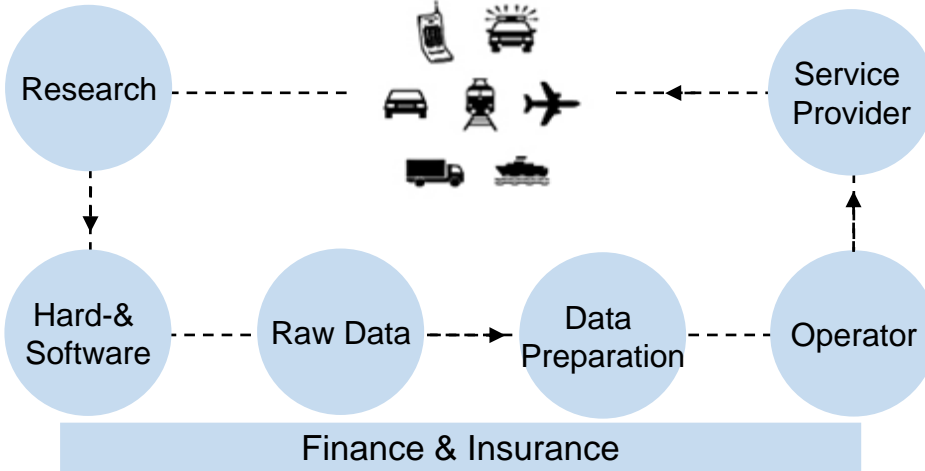
7

Railway Tec.



2

Tourism & Leisure



8

GIS/ Land Use



1

e-Health/ Telemedicine

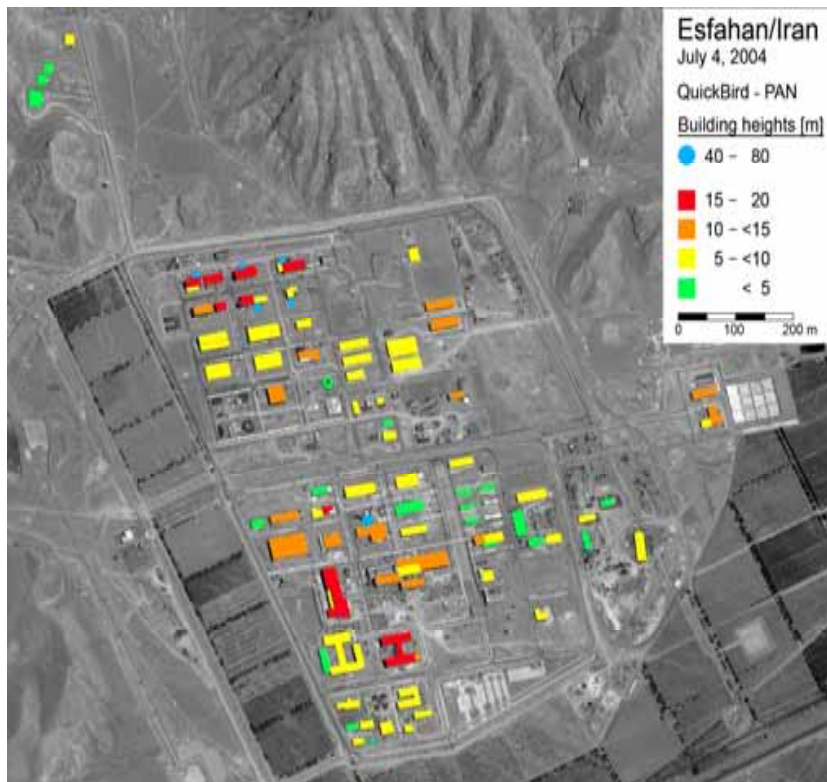


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GMES

## The bavAIRia GMES-Office concentrates Bavarian GMES-Competencies and Activities

### GMES



Example Iran, Esfahan, Nuclear Safeguards, Building Heights from Satellite Data

### Comments

- GMES is besides Galileo the second largest space application project of the European Commission. Bavaria is home of ca. 25 companies and institutes with expertise in the scope of GMES.
- The bavAIRia GMES-Office has the following goals:
  - Representation of interests on Federal- and EU-Level
  - Networking of relevant Companies and Research Institutes in Bavaria. For this periodical meetings of a GMES- Working Group and convening of Workshops such as “Satellite Services for Environment and Security“ and “Satellite-based Integrated Applications”.
  - Supporting the participation in EU- und ESA- Programms (so far succesful participation in 15 ESA and EU projects)
  - Marketing activities (Publishing of Broschures, participation in trade/fair shows)

# Bavarian GMES Competencies & Key Actors have been compiled in a Fact Book

- Land Monitoring



- Emergency Response



- Monitoring of the Atmosphere



- Marine Services



- Civil Security



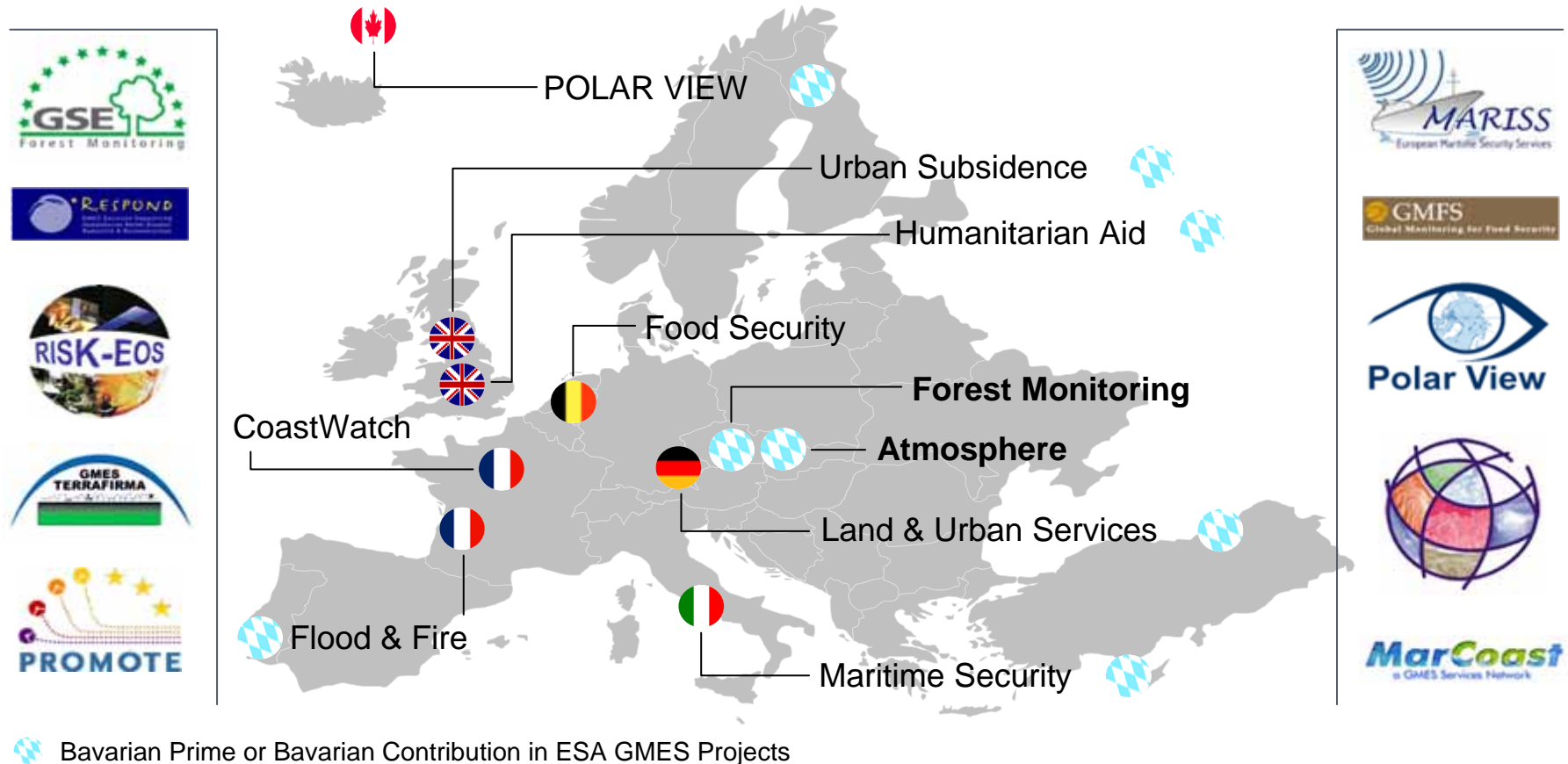
- Climate Change



*Monitoring für Umwelt und Sicherheit – die Kompetenzen Bayerns in GMES*



# As of today Bavaria participates in 8 of 10 GMES Service Element Projects of ESA



## Bavaria participates in 4 of 5 Fast Track- and Pilot Projects in the EU-FP7 for Development and Validation of preoperational GMES Core Services

- Land Monitoring:   
- Emergency Response:   
- Marine Services:   -
- Security:   
- Atmosphere:   

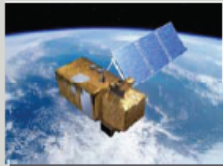
# GMES Missions: The Sentinel Satellites



## Sentinel 1 – SAR imaging

Wetterunabhängig; Tag / Nacht; Interferometrie

2011



## Sentinel 2 – Multispectral imaging

Landbezogene Anwendungen: Stadt, Wald, Landwirtschaft...  
Kontinuität von Landsat, SPOT

2012



## Sentinel 3 – Ocean and global land monitoring

Meeres-Farbe, Vegetation, Meer / Land  
Oberflächentemperatur, Altimetrie

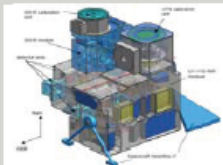
2012



## Sentinel 4 – Geostationary atmospheric

Beobachtung der Zusammensetzung der Atmosphäre,  
grenz-überschreitende Verschmutzung

2017+



## Sentinel 5 and precursor – Low-orbit atmospheric

Beobachtung der Zusammensetzung der Atmosphäre

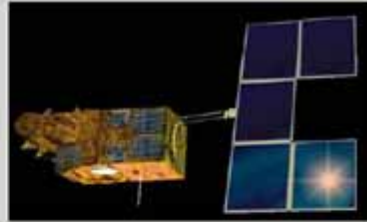
2014, 2019



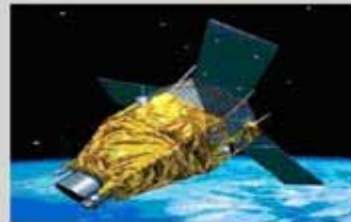
# Contributing Missions



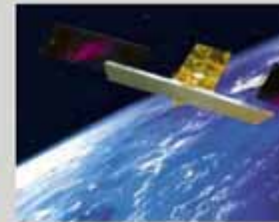
Jason



SPOT



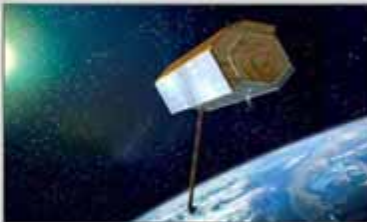
Pléiades



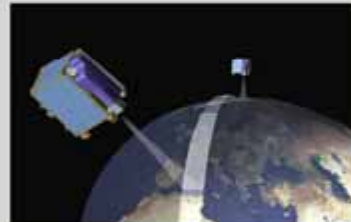
Cosmo-Skymed



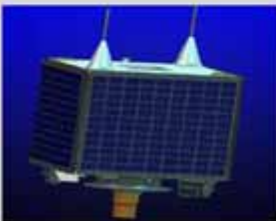
Radarsat



Terrasar-X



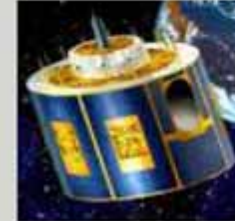
RapidEye



DMCs



METOP



MSG

# Global Monitoring For Environment and Security bavAIRia's GMES Office concentrates EO Competence in Bavaria

## Geoinfo products for crisis management



1

**Flood in Namibia Angola  
March 25, 2009**

2

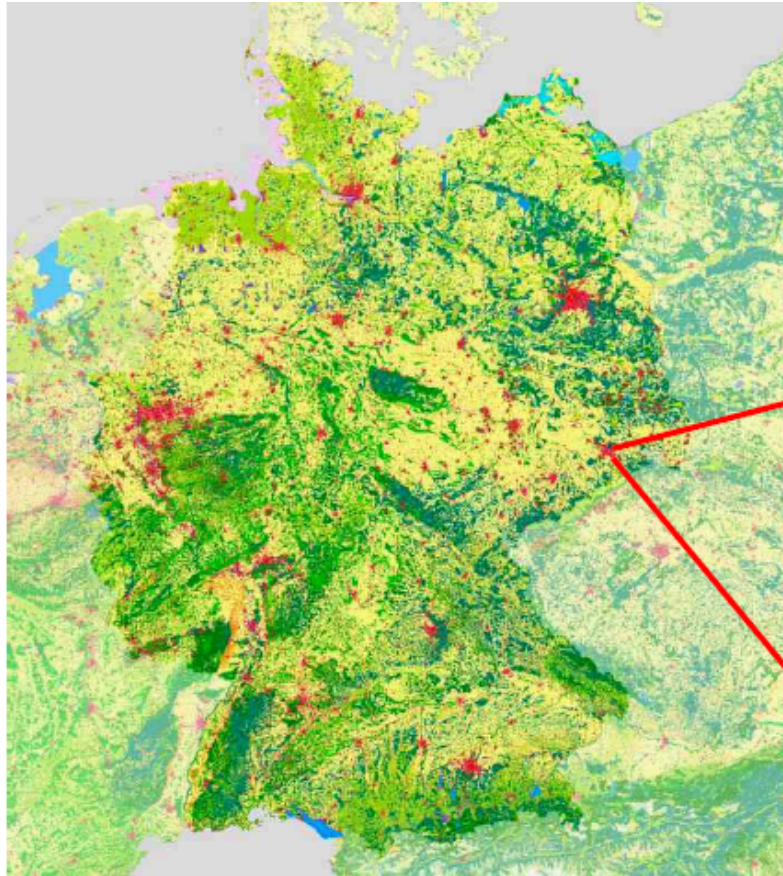
**Forest Fire in Greece,Attica  
August 25,2009**

3

**Iran, Esfahan, Nuclear Safeguards  
July 04, 2004**

The GMES Office has identified relevant Bavarian expertise and has established networks of industry, research and public authorities which assure the effective use of GMES for environmental and security applications.

## European Land Cover Classification 1990-2006



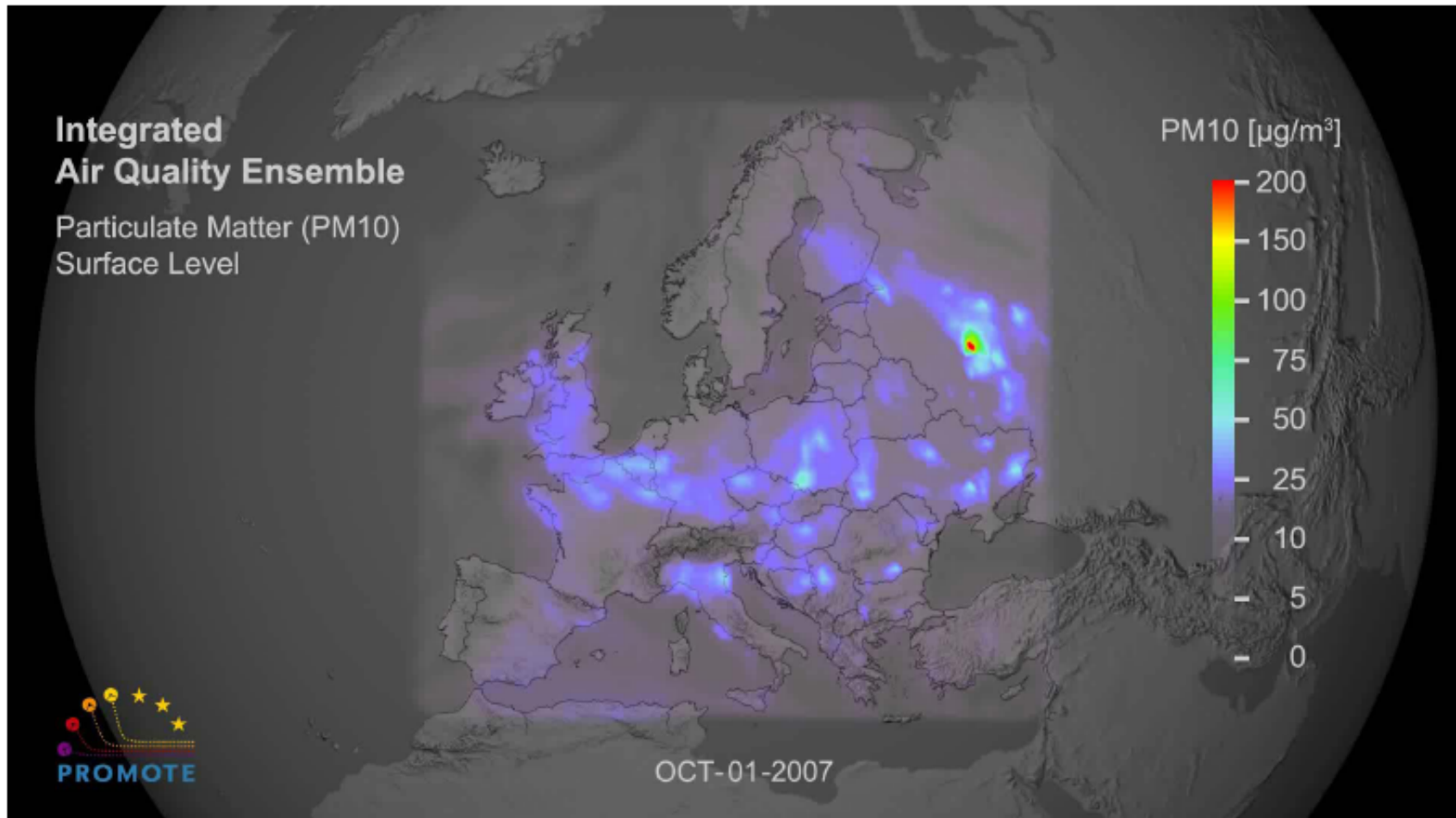
CLC 2000: Landsat-7 ETM+ (1999 to 2001)

- EU-wide, 2006 in nearly all European countries
- harmonized method, classification key: 44 classes in Europe
- DFD: national coordination for Germany on behalf of UBA



Subarea of Dresden

## Particulate Matter Distribution in Europe (GMES-Service)



# UV-CHECK

## Goal

Individual Sun Burning Time

## Tasks

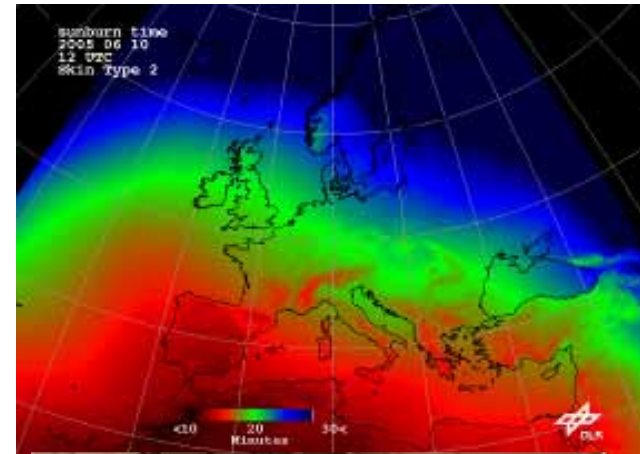
Provision of User Specific and Localized Information

## Potentials

**Earth Observation:** Computation of UV-Exposure in Dependence of Geographical Coordinates and Time of Day Based on Ozon Concentration and Aerosol Distribution

**Navigation:** Lokalisierung des Nutzers

**Communication:** Distribution via Mobile Telephone



## Bavarian Contribution to Polar View – GMES Service for Ice and Snow



Since 2005 the Munich company VISTA is part of the Polar View Team and contributes to:

- **NRT Snow Cover Mapping** for Central Europe using operational optical and microwave EO
- **Snow Water Equivalent estimations for the Alps** using joined EO observation and water balance modeling
- **Hydropower** simulations and forecast

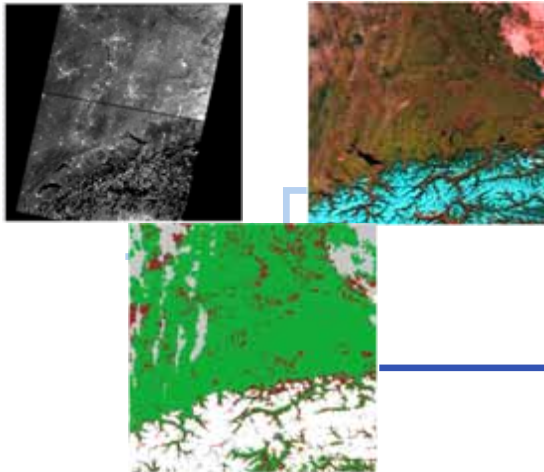
Polar View information products are used by:

- Flood forecast center HVZ of LfU Baden-Württemberg, Karlsruhe, Germany
- Flood information service of LUWG Rheinland-Pfalz, Mainz, Germany
- German Federal Institute of Hydrology (BfG), Koblenz, Germany
- Amt der Vorarlberger Landesregierung, Bregenz, Austria
- WSL Institute for Snow and Avalanche Research SLF, Davos, Switzerland
- LMU University of Munich (GLOWA Danube & SMOS cal/val), Germany

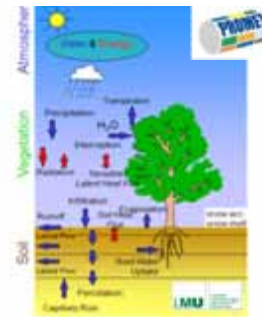


# VISTA's Near Real Time Snow Service Central Europe

Operational EO data processing  
ENVISAT ASAR + NOAA/METOP AVHRR

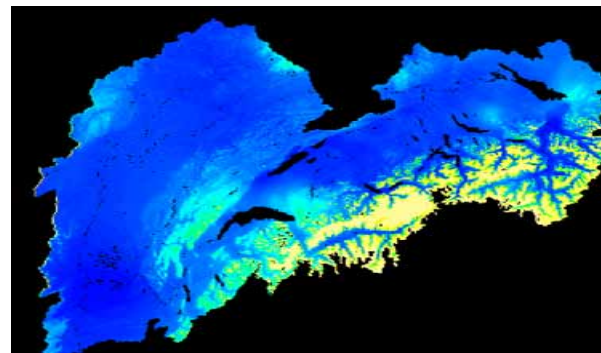


Daily snow cover maps & wet snow detection products used for flood forecast and hydrological analysis

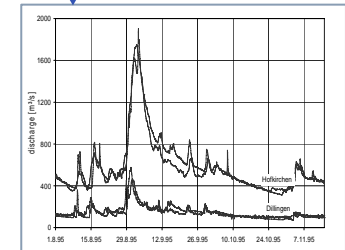


Meteo-Data

Modelling of snow storage, runoff along rivers and hydropower production



Snow Water Equivalent from joined observation and modeling



River Runoff

# Bavarian Contribution to Polar View European Snow Monitoring



Hosting of a **Snow Service Portal**  
by VISTA:

- Multiday products of the snow cover generated from daily & high resolution results of the Polar View Snow Service Providers
  - KSAT (Norway)
  - SYKE (Finland)
  - VISTA (Germany)
- Minimum cloud cover achieved applying a 10 day composite
- Snow cover fraction represented in 5 classes in 0.05° resolution



direct access via  
[www.snowsense.de](http://www.snowsense.de)





- **NEREUS is the Network of 25 European REgions Using Space Technologies founded in 2007**
- **Goals: - To act as strong voice for the regional dimensions of space policy to enhance the participation of citizens and companies in the European space policy**
  - **Strengthen the cooperation between regions**
  - **Stimulate joint projects**
- **Bavaria- represented by its Ministry of Economic Affairs- is member of NEREUS. bavAIRia e. V. is acting on behalf of the Ministry**
- **For practical cooperation 4 Working Groups were established:**
  - WG GMES /Earth Observation**
  - WG Satellite Navigation and Implementation**
  - WG Telecommunication**
  - WG Education, Training, Communication**

## CONTACT

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