Development of a European Drought Observatory and Drought Research

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1. **Europe**
   1. Methodology for drought M&A
      - Indicators (meteorological, soil moisture, remote sensing)
      - Analysis tools
   2. R&D on drought forecasting
   3. European Drought Observatory (EDO)
      - Pre-operational processing chain(s)
      - Web portal and map server for information exchange
      - Training & networking (e.g., WS&D EN)
   4. Regionally focussed research and implementation projects

2. **Africa**
   1. R&D on tools and Indicators for M&A
   2. R&D on forecasting

3. **Latin America**
   1. Collaboration with LA organisations and networks
   2. Web Map server
   3. Capacity Building & Training
Communication on Water Scarcity and Drought

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**Global Drought Monitoring System**

**European Reporting and Information System (WISE)**

- **JRC**
  - EDO
  - Global Drought Monitoring System

- **EEA**
  - WS&D-IS
  - European Reporting and Information System (WISE)

- **Network**
- **Network**

*yearly water scarcity indicators*

*yearly aggregated drought indicators*
• **Web-based Platform for detection, monitoring, forecasting and information exchange**
  - commonly agreed products (e.g. drought indices)
  - joint comparison and analysis of information
  - mutual exchange of knowledge & methodologies
  - direct up- and downscaling
  - real-time monitoring and forecasting (early warning, preparedness)

• **Multi-scale approach, integrating**
  - EU / continental level
  - MS level
  - Regional / river basin level

• **Subsidiarity principle**
  - European level information + platform (JRC)
  - National datasets managed at MS level
  - Regional information processed by river basin / regional environmental authorities
  - De-central data holding

Communication on Drought and Water Scarcity
Drought Management Plans

European Data Layers
- LC/LU
- Soil
- DEM
- RBs

Hydro-Meteorological Data
- Stations
- Fields
- Forecasts

Remote Sensing Data
- FAPAR
- NDWI
- Time Series

Hydrological Processes
- Monitoring & Modelling

Land Surface Processes

EDO Portal & Map Server

Products
- Rainfall Anomalies
- Soil Moisture Anomalies
- Vegetation Vigour

Relevant Authorities:
European, Member States, River Basins, …
Current EDO Products

- Precipitation
  - Monthly SPI (for different aggregation periods)

- Soil Moisture
  - Daily soil moisture
  - Daily soil moisture anomaly
  - Forecasted soil moisture anomaly
  - Forecasted soil moisture trend

- Vegetation status
  - NDWI 10-day daily composites
  - fAPAR 10-day composites.
  - fAPAR anomalies 10-day composites.

Composite Drought Indicator (Drought Alert)
3-month Standardized Precipitation Index (SPI) for 10-12/2008 aggregated to regional level

http://edo.jrc.ec.europa.eu/
Based on a modified Version of LISFLOOD
5km spatial resolution
EDO: Photosynthetic Activity (fAPAR)

- fAPAR, 21-31 May 2009
- 1km resolution

- fAPAR Anomaly, 21-31 May 2009

- Calculated from MERIS and SeaWIFS data (1997 →)
Forecasted Probability for SPI < -1.5

1-month Probabilistic Forecast of SPI-3

July 2007

Observed SPI

Probability that SPI-3 for the next month is "severe dry" or worse

(SPI < 1.5)
Assessment of the drought situation in Europe:

Who...: an administrative user
What..: get an overview of the drought situation in Europe and detailed information on affected regions
How…: start from the EDO map server…

http://edo.jrc.ec.europa.eu/
EDO: Status and Future

Status (2010):
• Prototype map server established and running
• Regular processing of precipitation, soil moisture and RS indicators
• Networked with EU scientific community (e.g., XEROCHORE, EUROGEOSS, …)
• Regular consultation with EU, national and regional stakeholders
• First collaboration agreements signed (DMCSEE)
• Carpathian Climate Project to start

Further System Development (2011 – 2012)
• Further development of the prototype EDO Map Server and Portal
• Stepwise integration of drought information from pilot MS (Spain, Slovenia, …)
• Bottom-up approach, increasing level of complexity
• Data exchange, standards and protocols (EUROGEOSS project)

Research and Development (ongoing)
• Drought indices (development, testing, validation)
• Drought forecasting (development & testing of monthly forecast products)
• Drought hazard analysis
• Common development of Land Use Modelling Platform (LUMP) for scenario analysis and impact assessment

Areal Extension & Networking (ongoing)
• Transfer, test and adaption of tools to cases of Africa and Latin America
• Foster global exchange and networking (e.g., NDMC, GEO, UNCCD, …)
Potential Contribution to IDMP

• Intellectual (e.g., Guidance, Training Materials):
  • Possible contribution in fields of expertise:
    • Monitoring and assessment
    • Indicators (meteorological, hydrological, remote sensing)
    • Interoperability of different Observatories
  • Implementation:
    • Possible contribution to European node
  • Awareness/Education/Training:
    • Possible contribution to Training
THANK YOU!

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