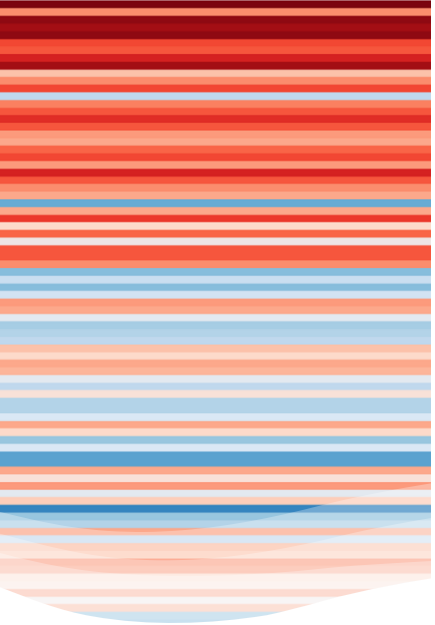
Climate services at a national level and its coordination with Copernicus: the example of Germany

Sarah Jones,Tobias Fuchs, Stephanie Hänsel, Katrin Koch

09. April 2025



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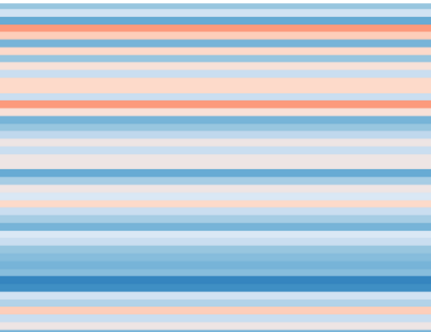
Climate Services at Different Levels



Climate Services: Global – EU – National

- Operational European climate and atmosphere services with trans-national dimension
- Free access to quality-assured data allowing for informed decision-making and policy development

Climate Services: Global – EU – National

- Global Institutions and Frameworks
  - WMO Commissions, UN Agencies, GEO
- International Agreements and Initiatives
  - Paris Agreement
- Global Players
  - EUMETSAT

GFCS
GLOBAL FRAMEWORK FOR CLIMATE SERVICES

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- Operational, national climate services of DWD and its partners
- Free access to national datasets, products and services for applications on all governmental levels

DWD

National Climate Services & Copernicus

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	**Provision of Nat. Climate Services based on transnat. Coperniucs products** • Integrating & leveraging Copernicus data to provide sector-specific atmospheric & climate services for decision-making

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- Integrating & leveraging Copernicus data to provide sector-specific atmospheric & climate services for decision-making

Refinement of transnational European-Level Data for National Use

- Downscaling & processing of pan-European datasets
- Integration of higher-resolution local datasets → sub-national and/ or municipal level

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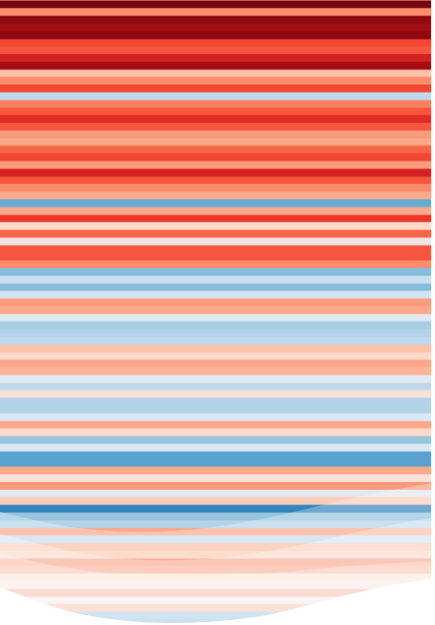
Providing Copernicus with Ground-Based Observational Data

- Validation & accuracy improvement of satellite observations through combining them with ground-based remote sensing data, as well as integrating national in-situ datasets



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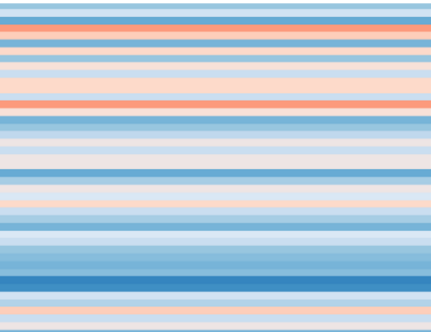
Climate Services at a National Level: DWD, Germany



DWD Climate Services: Contribution to National Strategies

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Climate Adaption

- German CC adaptation strategy (DAS)
- Monitoring/ Impact/ Risk/ Adaptation
- National Climate adaptation law 2023 (enacted 01. July 2024)
- Preventive climate adaptation strategy with measurable goals

Disaster Risk Management

- National Resilience Strategy 2022
- Implementation plan

Heat Prevention

- National Heat Protection Plan 2024

DWD Mandate: Climate Change Adaptation

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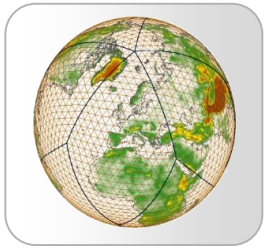
Climate Adaption

- Uniform data base for climate adaptation measures in Germany
- Recommendations on use of climate information & its limitations
- Objective climate data & information based on latest findings
- Comprehensive ensemble of regional climate projections to represent uncertainty
- Quality-assured data at high spatial resolution
- Climate services currently based on CMIP5 global climate projections data



CMIP
The World Climate Research Programme's Coupled Model Intercomparison Project

WCRP CORDEX

DAS Core Service “Climate and Water”

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Climate Adaption

- The German CC Adaptation Strategy DAS covers 14 fields of action and defines the necessity of national data and consultation services
  → DWD and DAS core service
- DAS core service provides up-to-date, reliable and consistent data and information as well as operational services derived from them
- Data are used for climate change impact assessments and the suggestion of adaptation options

DAS Basisdienst
Klima und Wasser

BSH Bundesamt für Seeschifffahrt und Hydrographie
BAW Bundesanstalt für Wasserbau
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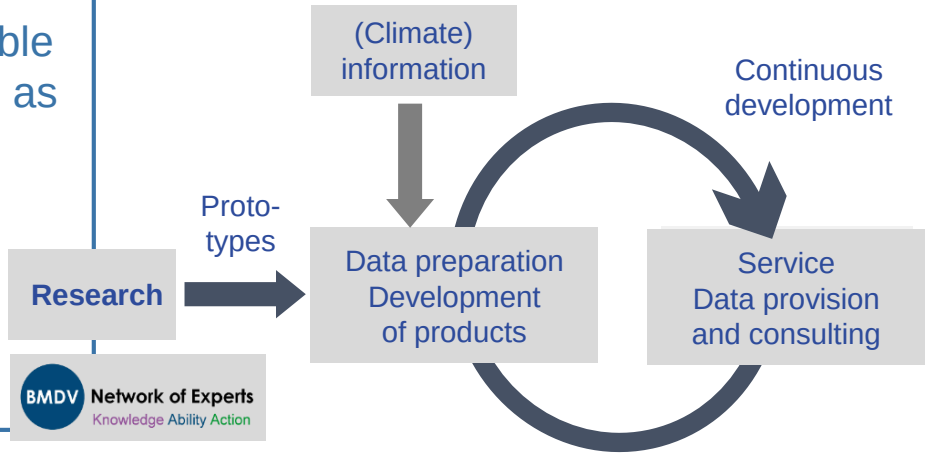
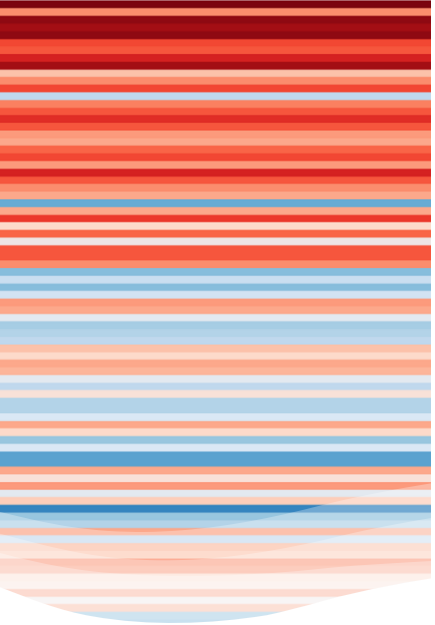
bfg Bundesanstalt für Gewässerkunde





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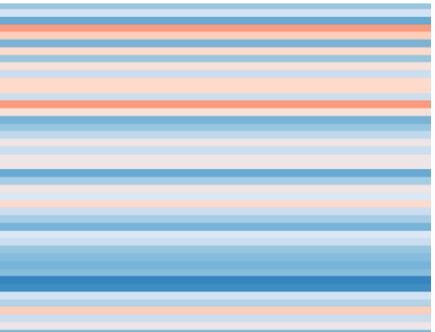
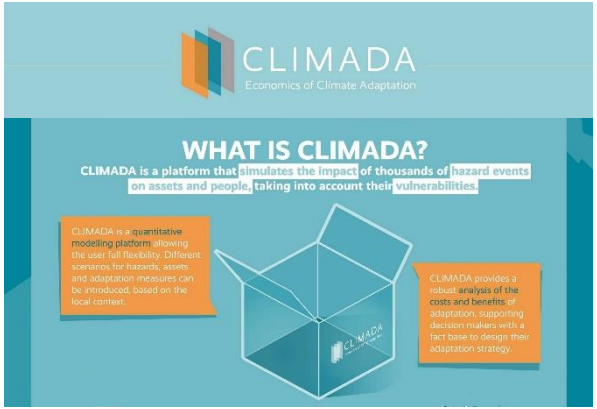


U-CLIMADAPT

User-centric Assessment of Climate Change Impacts for Adaptation

- Foundation for user-driven adaptation appraisal
  - Provision of refined & socioeconomically relevant climate impact assessments
  - Climate forecasts & projections from the C3S Climate Data Store (CDS)



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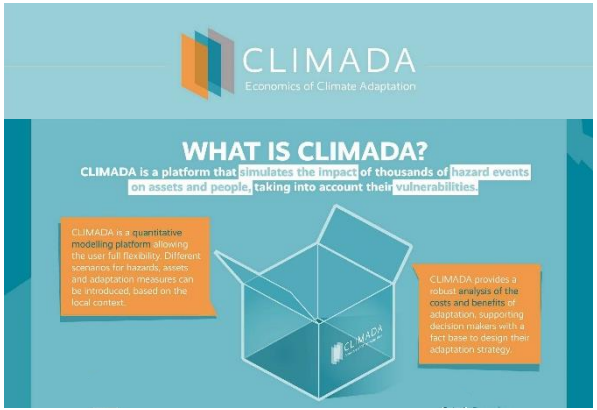
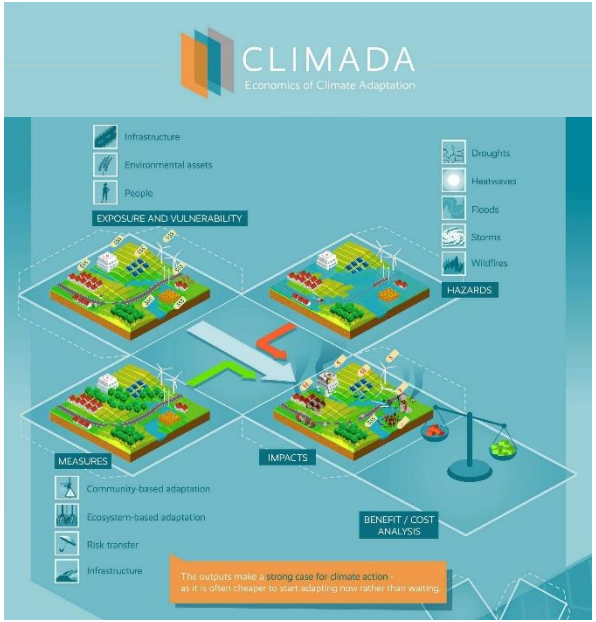
  - Climate forecasts & projections from the C3S Climate Data Store (CDS)
- Operationalization of downstream applications & services
  - Providing new users access to novel operational services
  - Stakeholder engagement
  - Upgrading & promoting the open-access global platform CLIMADA



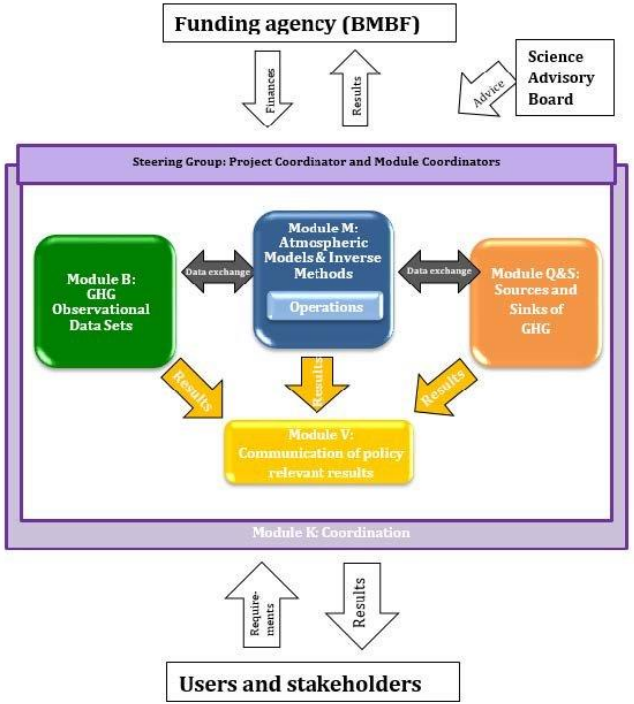
U-CLIMADAPT

Output & Results

- National use-cases for climatic extreme impacts (Germany + Switzerland)
- Web-based operational crowdsourcing platform to gather architectural information
- Quantification of aerosol impact on urban heat and human heat stress
- Freely available, open-source stochastic rainfall generator linked to Copernicus data
- Enlargement of the user community by integrating user-relevant impact indicators into DWD's pre-operational services



Integrated Greenhouse Gas Monitoring System for Germany (ITMS)



ITMS Key Elements

- Comprehensive Monitoring System
- Reliable Verification
- Data Integration
- Inverse Modelling

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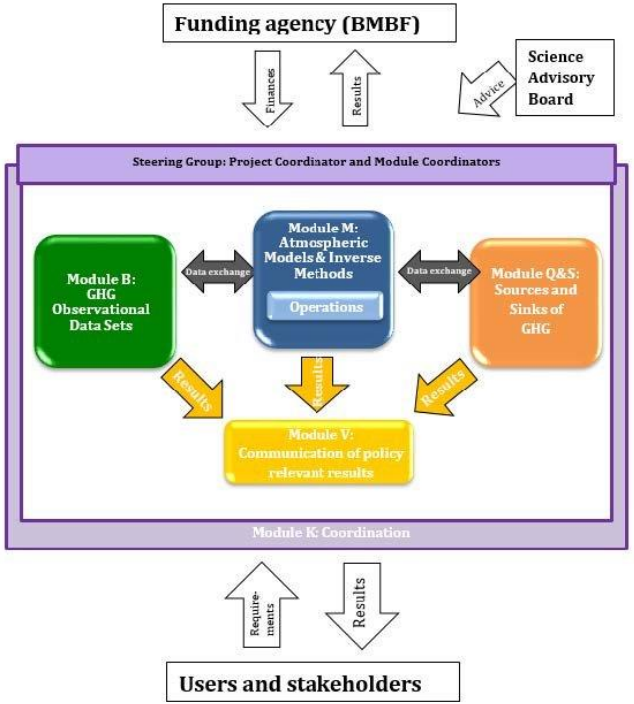

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- Policy Support
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CAMS

- Alignment in supporting effective climate action and compliance
- Synergy between national and European efforts in GHG monitoring in order to ensure comprehensive and accurate atmospheric data for policymakers and researchers
- National methodologies and data can enhance the accuracy and resolution of CAMS products

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- Resource Allocation
- User and Stakeholder Engagement

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- Enhanced & Informed Decision-Making
- Sector-specific Insights & Support for Sectoral Planning
- Support for Climate Action on different Scales
- Stronger Transnational, National and Regional Coordination

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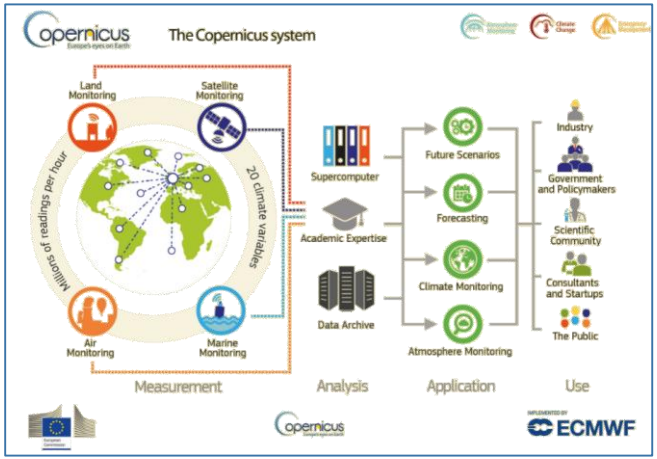
Outlook and Take-away Messages

A Multi-Level Climate & Atmospheric Monitoring Framework - the way forward?

- Multi-level approach ensures that trans-national European climate and atmospheric data is actively used
- By bridging trans-national European observations and services with national expertise and implementation Copernicus
  - enables precise, localized climate adaptation and air quality management
  - reinforces the EU's leadership in global climate action

National Meteorological Services + other national partners



Thank you for your attention!

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References

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