

## The 'Virtual Alpine Observatory': Combining the Research Activities of the European Alpine High Altitude Research Observatories for an Enhanced Climate and Environmental Monitoring



Climate change impacts the system Earth. Especially, the Alpine region is known as being very sensitive to this. Alpine high altitude research stations contribute significantly to monitoring, understanding and forecasting of processes in the Earth system. Their exposed location create almost ideal conditions for the investigation of many physical and chemical processes in the atmosphere, geosphere, cryo- and hydrosphere and the biosphere. The Virtual Alpine Observatory project (VAO) supports the research activities of the Alpine high altitude research stations by combining their measurements and performing joint research projects. Access to other data, e.g. satellite-based, and to high performance computing facilities create almost unique research opportunities.

### The central elements of VAO are:

- Linking the IT of the high altitude research stations including quality assurance and data storage
- Defining and realizing joint basic research and application-oriented projects related to climate change and climate adaptation
- Delivery of information about transition to renewable energy sources and natural hazards of a changing climate
- Improving flood control and producing better estimates of water resources
- Preparing statements to ensure the touristic use of the Alpine region
- Flanking the VAO project with national and European funded projects

### Associated research stations:

International Foundation 'High Altitude Research Stations Jungfrauoch & Gornergrat' (Switzerland)  
Sonnblick Observatory (Austria)  
European Academy of Bozen/Bolzano (Italy)  
Haute Provence Observatory (France)

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## Partner Institutions

German Aerospace Center  
The German Remote Sensing Data Center (DFD)



Karlsruhe Institute of Technology  
Institute for Meteorology and Climate Research (IMK)



Helmholtz Zentrum München  
German Research Center for Environmental Health (GmbH)

Helmholtz Zentrum münchen  
Deutsches Forschungszentrum für Gesundheit und Umwelt

Institute of Comprehensive Molecular Analytics  
Institute of Radiation Protection

Umweltbundesamt  
Global Atmosphere Watch



Technische Universität München  
Center of Life and Food Sciences Weihenstephan



Chair for Ecoclimatology

Ludwig-Maximilians-Universität München

Chair of Economic Geography and Tourism Research  
Chair of Physical Geography and Remote Sensing  
Clinical Center of the University of Munich



University of Augsburg

Chair of Physical Geography and Quantitative Methods  
Institute of Physics



Max Planck Institute for Dynamics and Self-Organization



Environmental Research Station Schneefernerhaus GmbH



Leibniz Supercomputing Centre of the Bavarian Academy of  
Sciences and Humanities



Bifa Environmental Institute GmbH



Bavarian Research Alliance GmbH



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