AlpEnDAC

The Alpine Environmental Data Analysis Centre – 2017/2018

Stephan Hachinger¹, Julian Meyer-Arnek², Helmut Heller¹, Christoph Harsch(⁵), Anton Frank¹, Oleg Goussev², Roland Mair³, Till Rehm⁴, Bianca Wittmann³, Michael Bittner²,⁵

1) Leibniz Supercomputing Centre / Bavarian Academy of Sciences & Humanitities (LRZ)
2) German Aerospace Center (DLR)
3) bifa Umweltinstitut GmbH
4) Umweltforschungsstation Schneefernerhaus (UFS)
5) University of Augsburg (UniA)

The project „Virtual Alpine Observatory (VAO): Development and Internationalization of the Virtual Alpine Observatory (VAO-II) at the Environmental Research Station Schneefernerhaus (UFS)“, including AlpEnDAC, has been funded by the Bavarian State Ministry of the Environment and Consumer Protection.
Research in the „era of data science“

Dan Ariely
January 6, 2013 at 6:17pm

Big data is like teenage sex: everyone talks about it, nobody really knows how to do it, everyone thinks everyone else is doing it, so everyone claims they are doing it...
AlpEnDaC: A joint effort of DLR/WDC-RSAT and LRZ

Satellite data, value added products & services

- Redundant big data MGMT systems (1PB)
  - OGC-compliant data, metadata systems

Scientific computing
- air-quality maps from simulations, etc.

IT service for scientific research

National & European supercomputing centre
- HPC, Cloud, etc.
- > 200,000 CPU cores on SuperMUC

Data science
- > 50 PByte archive, Big Data competence centre
Our mission is to help you with data-heavy science in practice:

We enable scientists around the VAO ...

... with or without experience in scientific computing ...

... to manage, archive, analyse, and publish their data.

• Data management, analysis & simulation platform
  → „data on demand“
  → „computing on demand“
  → „operating on demand“

• Help and consulting
A brief timeline of AlpEnDAC

**Kick-off, 1st user workshop**
- 2015

**Setup of Neo4J / Postgres Data Infrastructure @DLR**
- 2016

**iRODS distributed data store connects AlpEnDAC sites**
- 2017

**AlpEnDAC.eu “in production”**
- 2018

**“AlpEnDAC Phase II”**
The AlpEnDAC 2017/2018

A trip through the AlpEnDAC: front page www.alpendac.eu
A trip through the AlpEnDAC: „free-text + tag“-based data retrieval
A trip through the AlpEnDAC: Computing on Demand w/ FLEXPART

(A. Stohl et al.)

Backend technology:
LRZ Compute Cloud / EC2 Interface
A trip through the AlpEnDAC: Interoperability

- WMS or WFS data products from VAO partners can be easily integrated

  Example: EURAC Snow Cover (thanks!)

- Metadata catalogue available (on request) via an OAI-PMH interface

  → can be integrated e.g. in German „super-data-repository“ GeRDI
A trip through the AlpEnDAC: daily-simulation data products

WRF (Europe, Alps, BY/Tirol)

Polyphemus/DLR air quality

GFS and ECMWF mirror repository (2010-ongoing)

GFS 0.25/0.5° forecast archive

DLR / LRZ Data Science Store

ECMWF ERA-Interim archive

DLR / LRZ Data Science Store
But now you ask: „What’re you doing 2017/18, and what was that ... operating on demand?“ → AlpEnDAC Phase II

- Operating on demand:
  - Measured data „events“ can trigger analysis workflows („service on demand“)
  - These workflows can trigger instrument settings („operating on demand“)

- More in Talk of H. Heller!
2017/18, AlpEnDAC Phase II: data sources

Satellite data (→ integration
WDC-RSAT / AlpEnDAC)

Citizen Science / IoT

Mobile data sources
2017/18, AlpEnDAC Phase II – „the boring side“: Consolidation work

... or: „Good systems live of people doing the dirty work!“

Aim 1: convenient services on larger scale:

• Usability and UI convenience
• Interaction with more scientists and repositories
• Versatile technical interfaces

Aim 2: process-based AlpEnDAC operation:

• Plan-Do-Check-Act (cf. ISO 20000)
• Service-availability monitoring
• Helpdesk
Thank you – stay tuned for AlpEnDAC Phase II developments!

Following talks:
→ „Service for Science“ (Julian Meyer-Arnek)
→ Technical details / access to AlpEnDAC (Helmut Heller)

Dr. Julian Meyer-Arnek
German Aerospace Center (DLR)
Phone: +49 8153 28-1324
Email: julian.meyer-arnek@dlr.de

Dr. Stephan Hachinger, Dr. Helmut Heller
Leibniz Supercomputing Centre (LRZ)
Phone: +49 89 35831 7830
Email: hachinger@lrz.de, heller@lrz.de

VAO Coordinator:
Prof. Dr. Michael Bittner
German Aerospace Center / U. Augsburg
Phone: +49 (0)8153 28-1379
Email: michael.bittner@dlr.de

The project „Virtual Alpine Observatory (VAO): Development and Internationalization of the Virtual Alpine Observatory (VAO-II) at the Environmental Research Station Schneefernerhaus (UFS)” has been funded by the Bavarian State Ministry of the Environment and Consumer Protection.