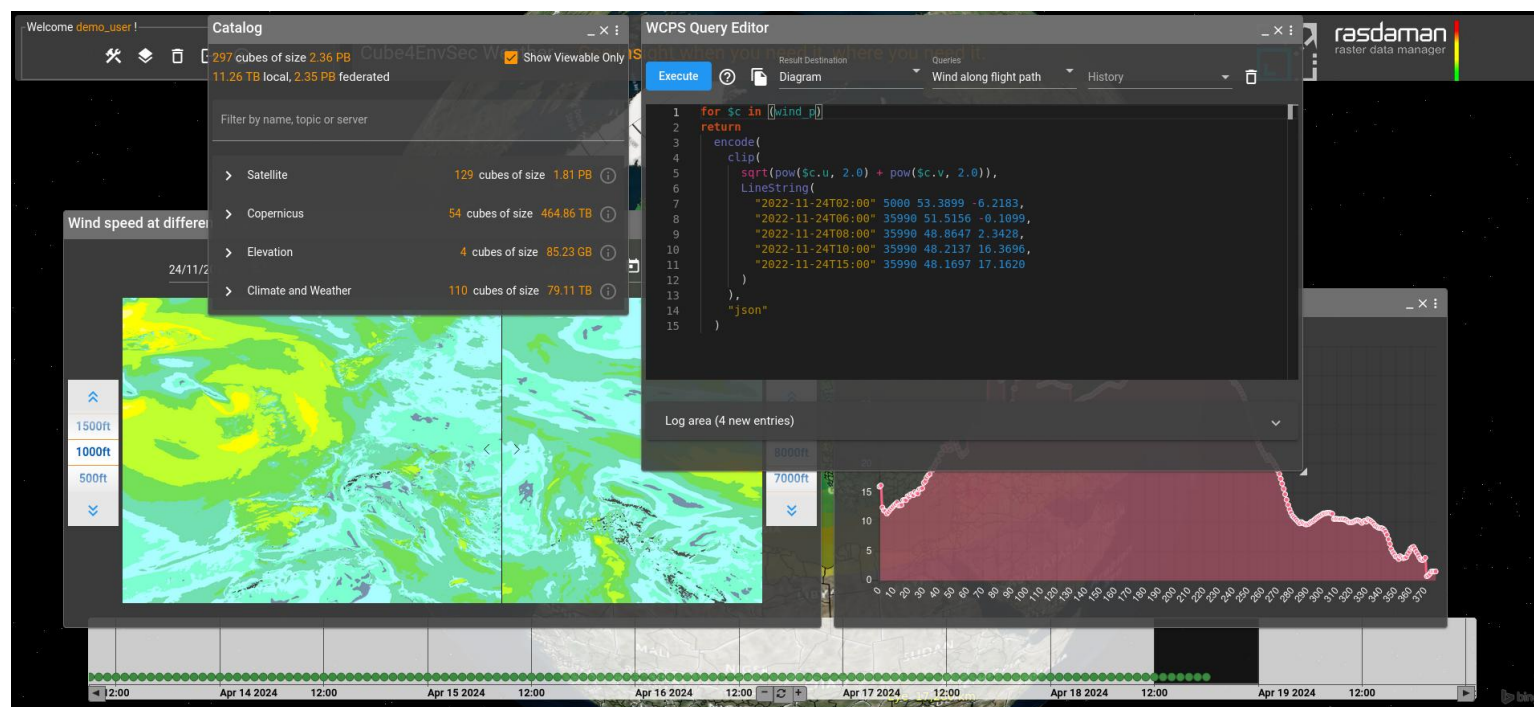# rasdaman:
Selected Further Features

the rasdaman team

rasdaman GmbH

Dashboard

- Various n-D display & action widgets, continuously extended

- Configurable (single JSON file): from kiosk to expert mode

- ✎ weather, lightning demo

Virtual Coverages

- Problem: how to combine inhomogeneous coverages?

- rasdaman: virtual coverage
  = (heterogeneous) collection of coverages, acting as single coverage

  - On every request, homogenized view created automatically

- Ex: Sentinel granules with individual UTM zones

  - Step 1: homogenize within UTM zone

  - Step 2: virtual coverage over UTM coverages

```
for $c in (utm_virtual)
return encode( $c[Lat(52.2:53.2), Long(11.93:15.1)], "tiff" )
```

- Query optimization

 - Read only file (part)s relevant, omit reprojection if unnecessary, ...

Datacube Federation

- Federation = collection of networked rasdaman services

- Single common data offering, location-transparent

  - incl distributed datacube fusion

- Ex: earthserver.world ↳ demo

max((A.nir - A.red) / (A.nir + A.red))
+ avg(B.green)
+ max((C.red + C.green + C.blue) / 3)

Dataset A

Dataset B

Dataset C
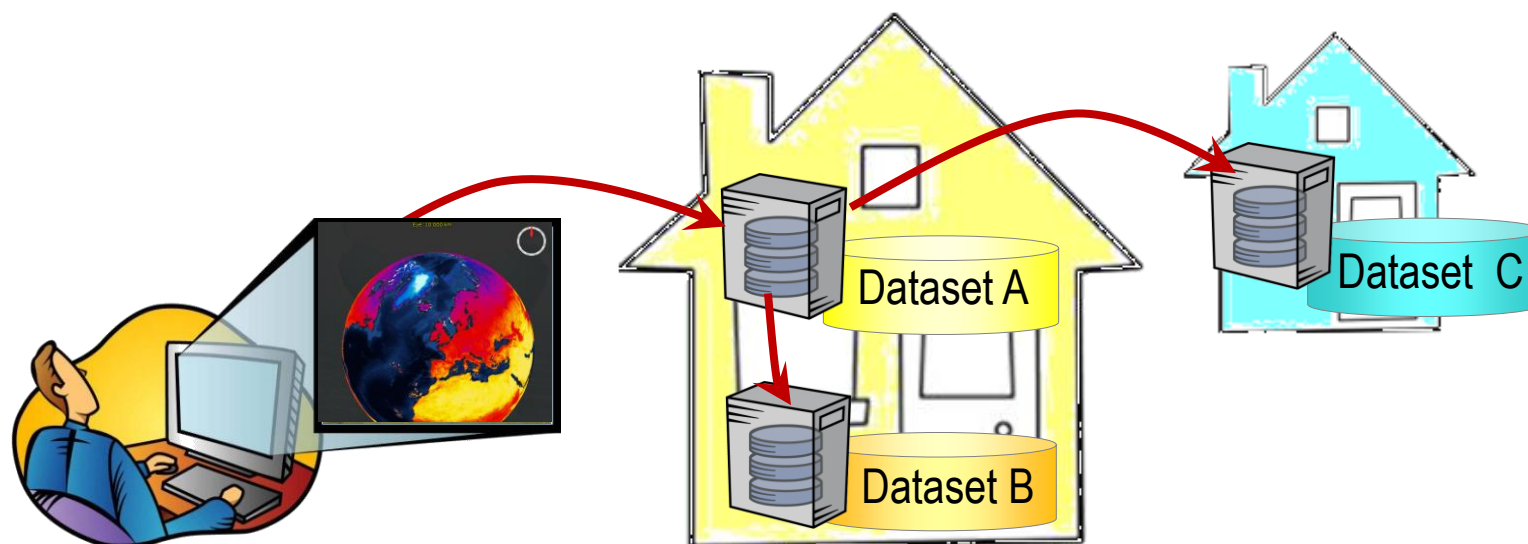
Server-Side External Code Integration

- UDF = function invoked in query, custom code executed on server

- **extend** QL with new functions

  - integrate external libraries

  - offer functionality without disclosing code

- **Direct embedding** in query processing pipeline

  - convenient for users

  - high performance

- Python & more languages supported

  - PyTorch for ML models
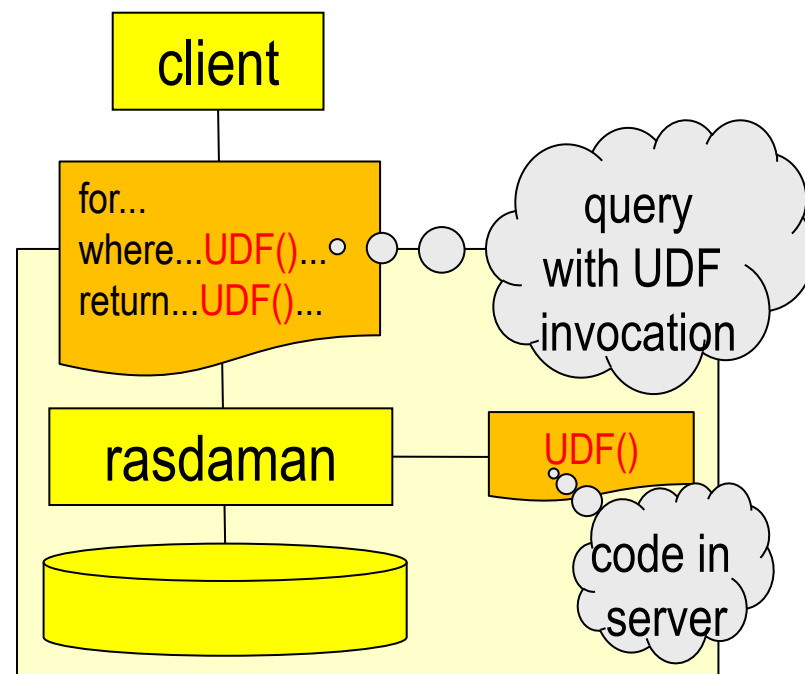
AI-Cubes™

- Goal: seamless integration of ML in datacube queries

  - FAIRiCUBE: model-based crop classification

```
for $s2 in (Sentinel_2), $m in (CropModel)
return encode( nn.predict( $s2[…], $m ), "tiff" )
```

- AI-Cube project: Natural Language Processing

  - RSVQA by TU Berlin / Begüm Demir

  - Demo: https://ai-cu.be

- Challenge: models quickly degrade
  when outside training comfort zone

[ConstructorU, WageningenR]

Security

- Access control

  - Standard Role-Based Access Control: users, roles

  - Extended with triggers & exemptions

  - Datacubes & regions within: down to single pixels

  - Security by design: cannot be circumvented by user

- Quota

  - Checked before query execution

- Billing