LifeWatch/EnvEurope
User Forum Use Case
Ecology
User Forum
Barcelona, March 2012
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LIFEWATCH

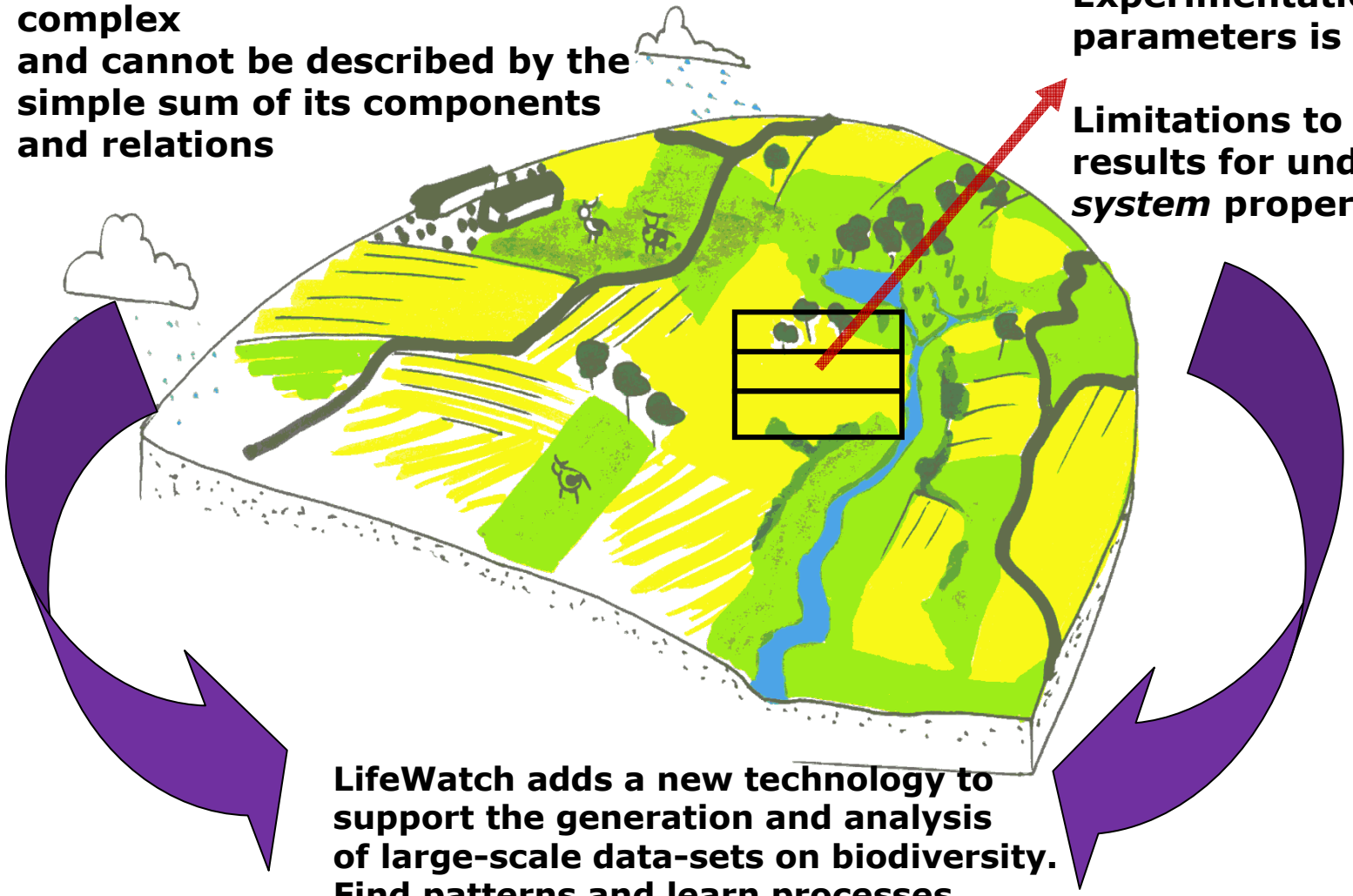
Infrastructure for Biodiversity and Ecosystem Research

SEVENTH FRAMEWORK PROGRAMME

The biodiversity *system* is complex and cannot be described by the simple sum of its components and relations

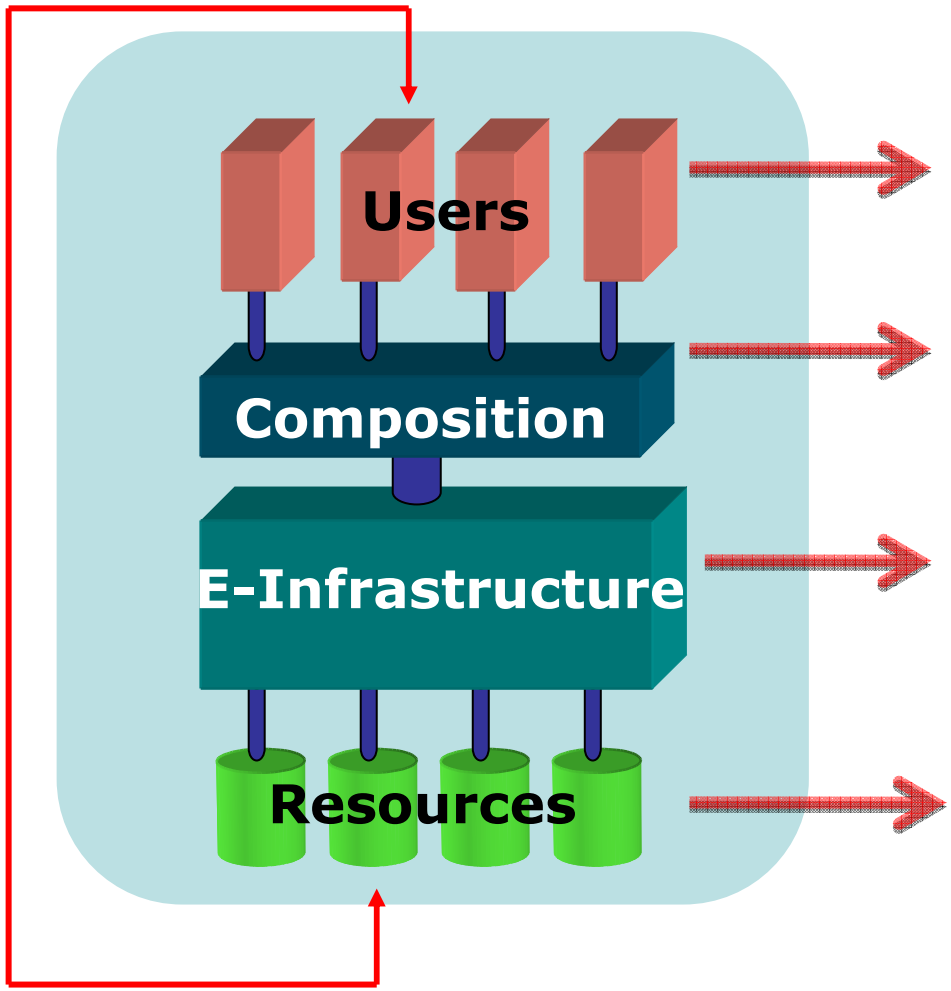
Experimentation on a few parameters is not enough:

Limitations to scaling up results for understanding *system* properties



LifeWatch adds a new technology to support the generation and analysis of large-scale data-sets on biodiversity. Find patterns and learn processes.

Architecture



Collaboration
- Common Exploratory Environment
- Collaborative Virtual Organisations

Semantic metadata framework and workflow development

Analysis and processing
- Integration of resources
- Documented, shared workflows
- Grid computation

Data; **Statistical Software; Distributed Computing Power**

Data from various origins sampled and in real time
In different spatial and temporal scales

EXTERNAL LIAISONS

LIFEWATCH

LTER europe
European Long-Term Ecosystem Research Network

genomics

Océans

MARS Network
The European Network of Marine Research Institutes and Stations

marbef

EDIT - European Distributed Institute of Taxonomy

Cetaf
Consortium Of European Taxonomic Facilities

CETAF - Consortium of European Taxonomic Facilities

GBIF
free and open access to biodiversity data
GLOBAL BIODIVERSITY INFORMATION FACILITY

EMODnet
European Marine Observation and Data Network

ELIXIR
EUROPEAN LIFE SCIENCES INFRASTRUCTURE FOR BIOLOGICAL INFORMATION

esa
space for europe
European Space Agency

SeaDataNet

Towards an ideal EUDAT usecase

- Choice of a REAL workflow currently elaborated by the LIFE+ project „EnvEurope" based on the sites network of LTER-Europe
- Type of data: biodiversity data PLUS data on drivers of biodiversity
- REAL institutions, 70 sites across Europe, existing data and accessory data gathered in the field
- Use of best available and acceptable technology (not necessariyl state of the art)
- Compliance with metadata standards (e.g. EML, INSPIRE)

Typical scope and design of ecosystem research sites (LTER-Europe example) challenging Information Management

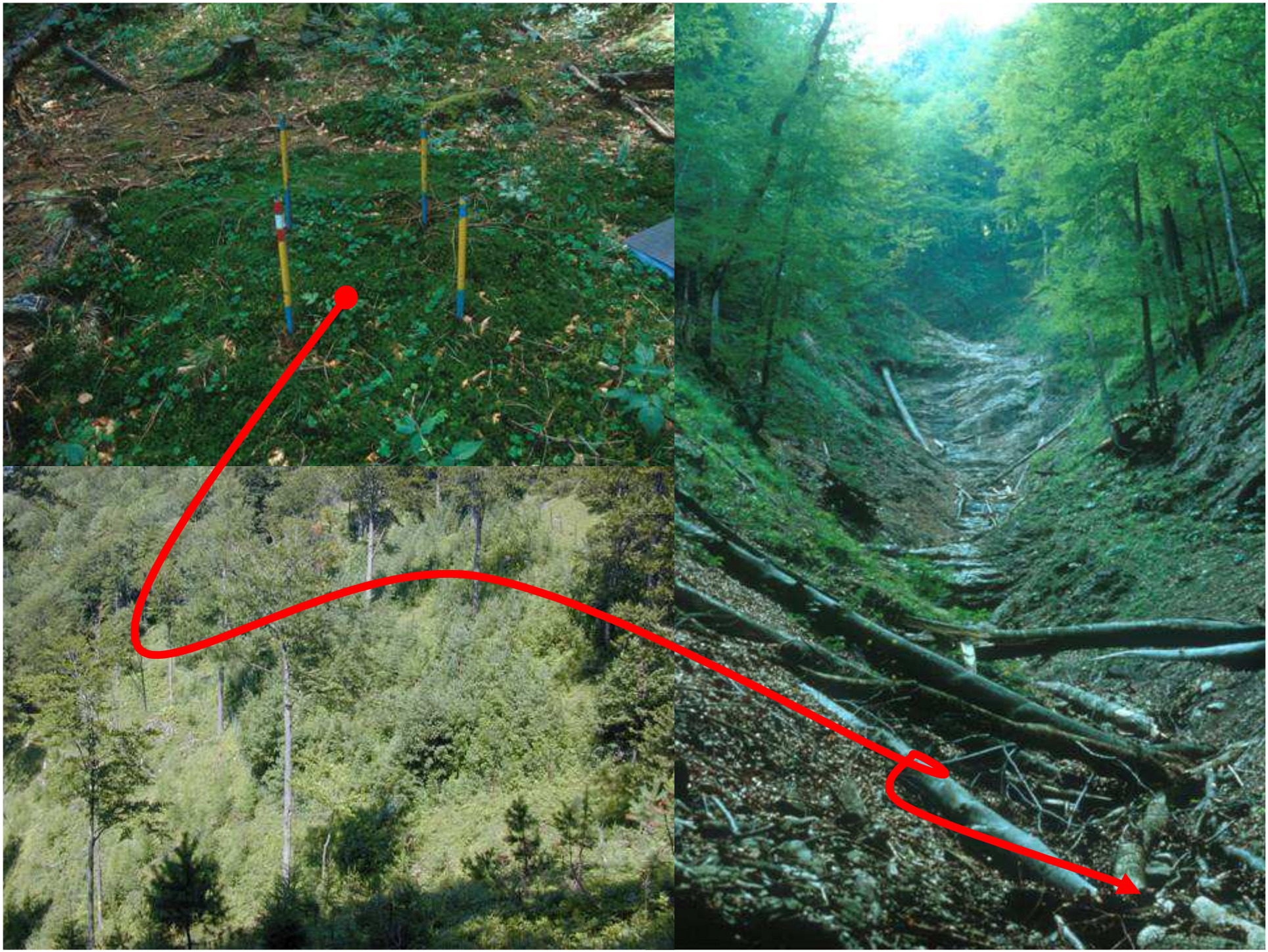
Input

Output

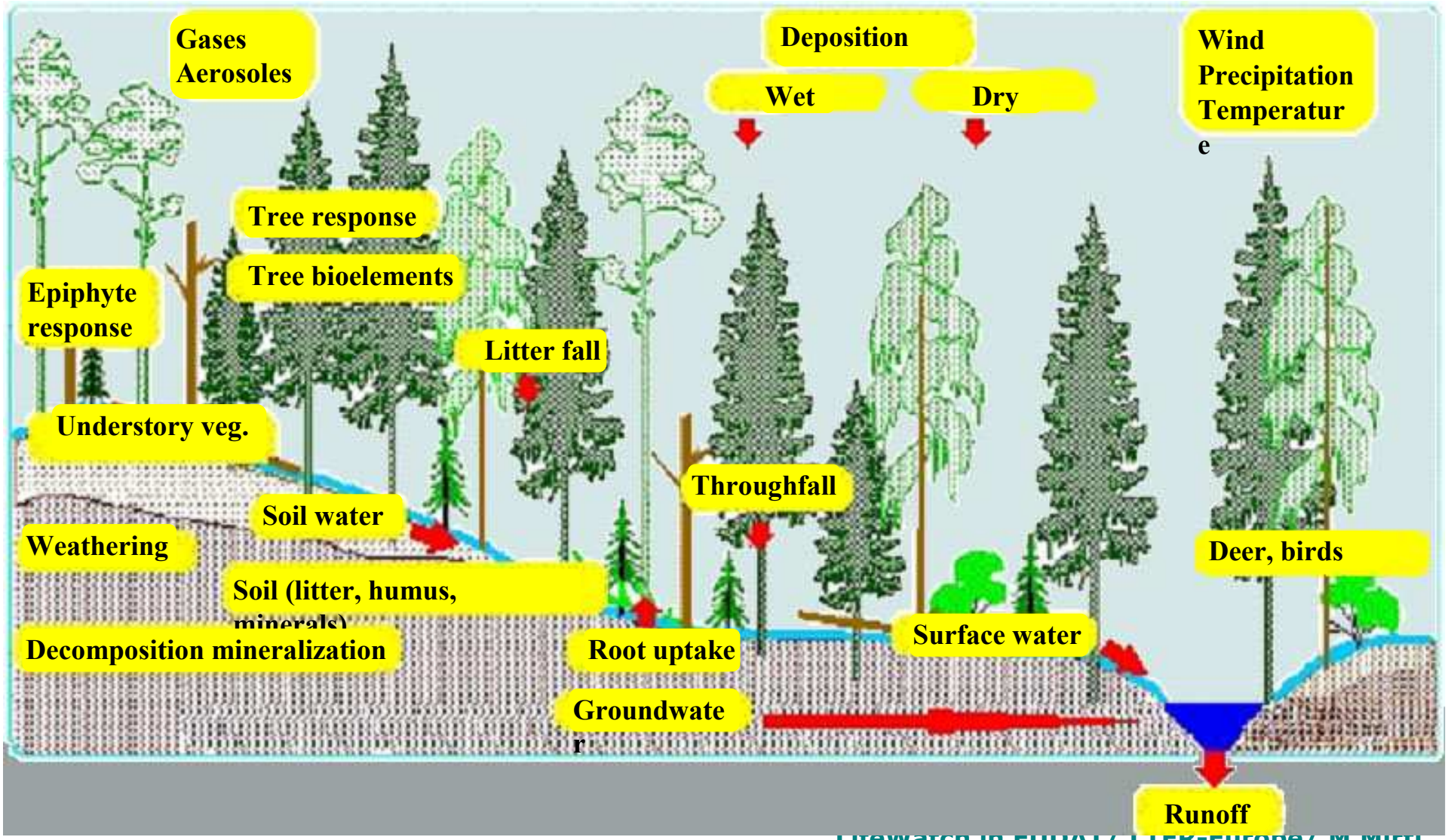
- primary production
- population ecology
- organic matter

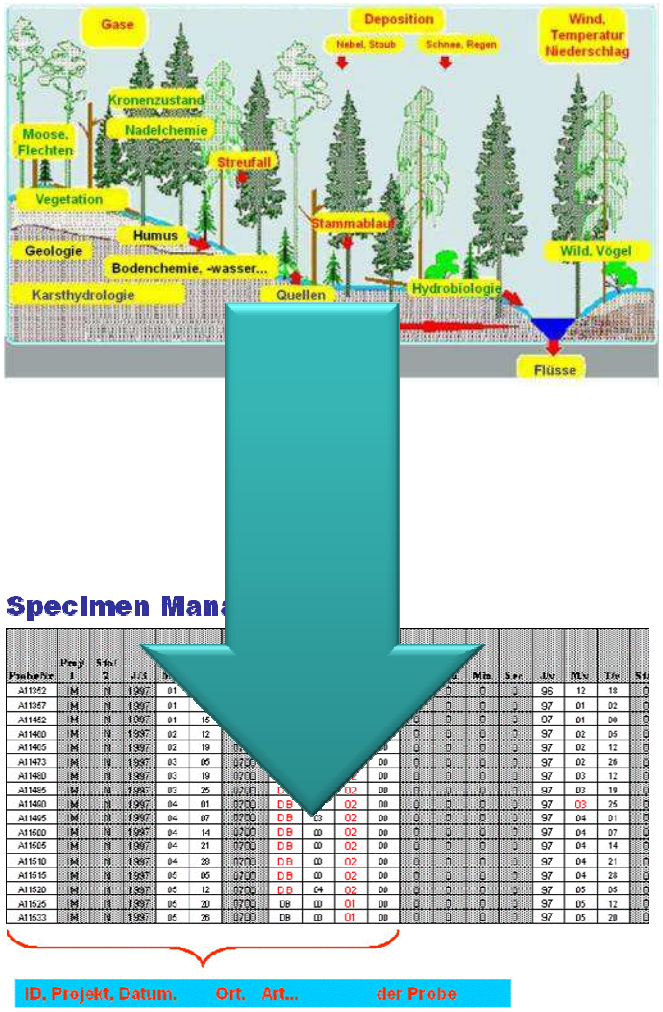
- inorganic inputs
- disturbances
- **biodiversity** (implicitly)

PLUS: main drivers



Challenge for MORIS: topics, space &..... time





Challenges

- Complex data sets
  - Different spatial, temporal, and thematic resolution of the observations
  - … need for a flexible entry and management of the data
- Long project duration
  - Changes in observation methods, staff, project aims, etc.
  - … need for flexible data structures
  - … need for safeguarding the reusability and interpretability of the data in the long term perspective
- Meta data
  - Staff, project, methods, documents, etc.
  - … need for the link between data and metadata to ensure the long term reusability of the data

Observation

An observation is gaining information on the...

- STATUS OF a PROPERTY
- OF a MEDIUM(object)
- AT a certain LOCATION (object)
- AT given TIME(s)
- Observed by someone/-what by use of a specific METHOD
- Reported by use of and refering to related STANDARDS (unit, reference list)

In addition:

- Method provides certain **quality of information** (accuracy, applicability constraints = primary metainformation)
- Status observed by an **observer** acting in the context of a **project**, pulling individual measurements together
- Observation specified by other **secondary metadata**

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Current situation ...

Relational database
(Oracle, PostgreSQL, …)

Relational database
(Microsoft Access)

Spreadsheet
(Microsoft Excel, etc.)

Spatial Data Files
(ESRI Shape File, etc.)

Spatial Database
(PostGIS, GeoDB, etc.)

Data Management

Structured text files
(txt, csv, etc.)

Unstrucutured Text Files
(docs, pdfs, etc.

Non digitised Data
(field records, etc.)

Data in proprietary Format
(Logger formats, etc.)

OGC Spatial Services
(WFS, WMS, WCS)

Sensor Web Enablement
(SWE)

Metadata Services
(CSW, proprietary)

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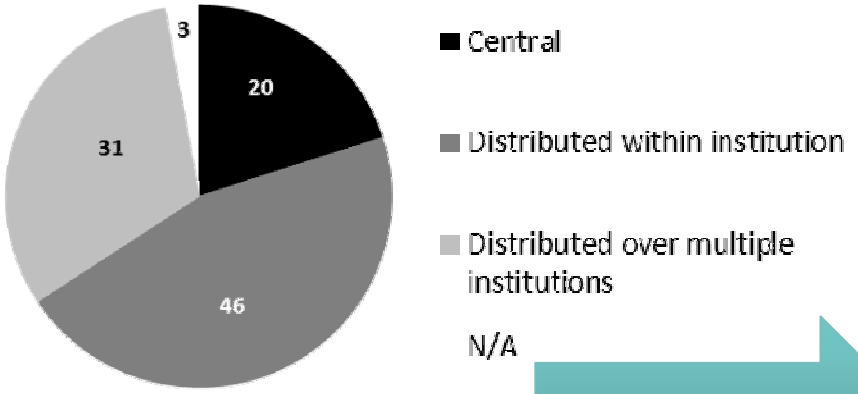
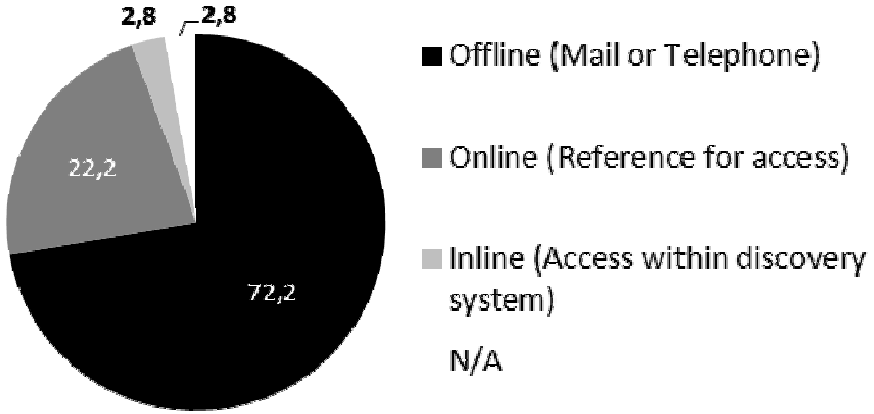
Current situation & challenges

Places of data storage …



Handling data requests …



Challenges

- Distributed data sources
- Heterogeneous data access
- Heterogeneous data management solutions
- Heterogeneous data models
- Complex domain ecosystem monitoring

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DATA: Data sharing

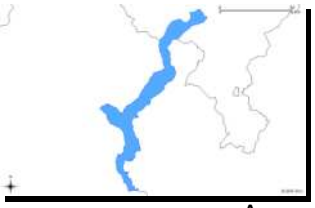
Discover available dataset series, datasets and services: a catalogue service allows the user to view and query related meta-data.

View available datasets: an online data access client allows the user to view data (WMS layers or tabular).

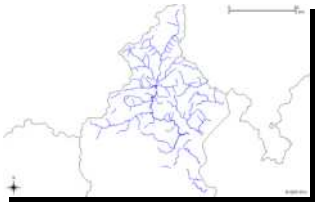
Download available datasets: an online data access client allows the user to download data
- Data files
- OGC spatial services (WFS, WCS)
- OGC Sensor Web (SOS)
- Linked Data

Harvesting Information form LTER Sites using OGC Services

Vector of sites



Area



Line

GeoPortal DB (optional)

WMS
WFS
GeoServer

KML
GML
XML
OpenLayers

GetFeature or GetMap

GetCapabilities

URL

for each vectors

MetaData of Sites (InfoBase)

CSW deegree

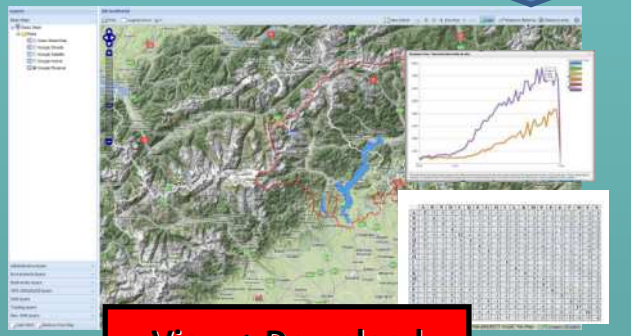
DataSet

SOS

Request (GetObservation, GetInformation, …)

GetCapabilities

URL (+ Geography information)



View + Download Service

Drupal

MetaData of Dataset (EML/Community profile)

1. Dataset Title
2. Dataset Identifier
3. Dataset Creator
…
13. Dataset OnLine Distribution
…
22. Dataset legal

Community MD profile

13. Dataset OnLine Distribution

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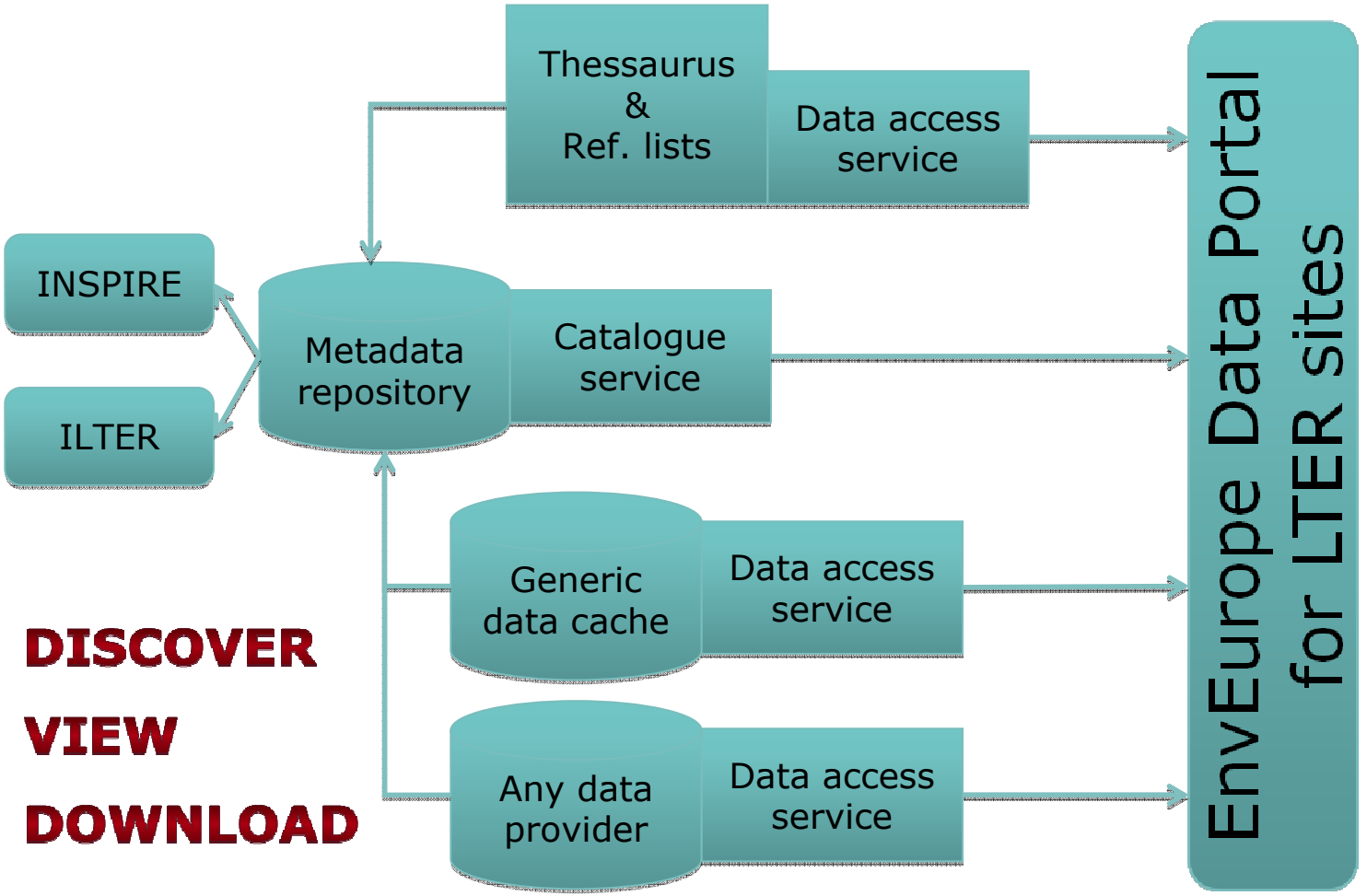
EnvEurope System Architecture for the "LifeWatch/LTER sites use case"



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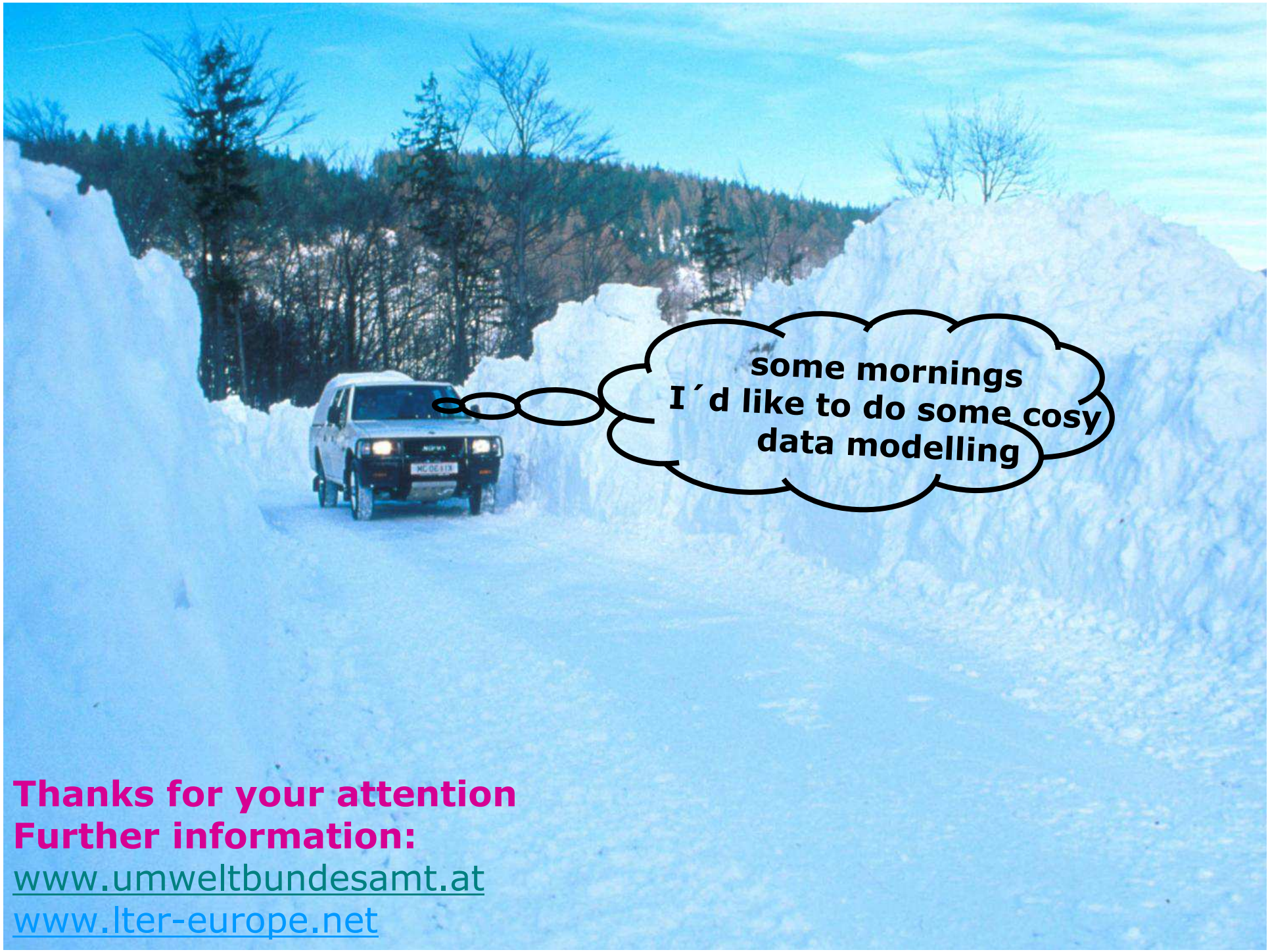
Key links with the LifeWatch reference model

- Wouter Los & Michael Mirtl

Expectations – references to envisaged benefits from EUDAT

- according to revised introductory presentations



Thanks for your attention
Further information:
www.umweltbundesamt.at
www.lter-europe.net