Virtual Research Environments as-a-Service

Donatella Castelli

CNR-ISTI

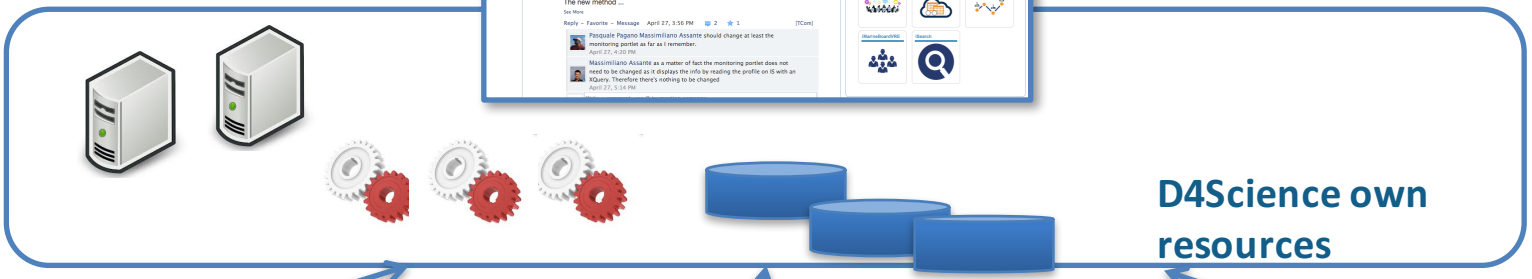
donatella.castelli@isti.cnr.it

Context

Research work is driven by Research Problems/Questions	These emerge dynamically & corresponding activities have a limited lifetime
Addressing research problems often requires interdisciplinary approaches	Multidisciplinary team & (re-)use of data, methodologies, model, tools produced in different domains
IT support can largely facilitate research work and it can enable research methods that were not possible before	The time and the cost of a research activity and of its assessment can be largely influenced by the capabilities & services offered by the IT supporting environment

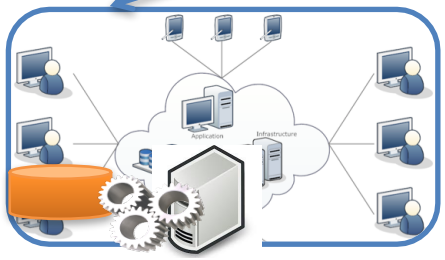
D4Science: an infrastructure ecosystem enabler

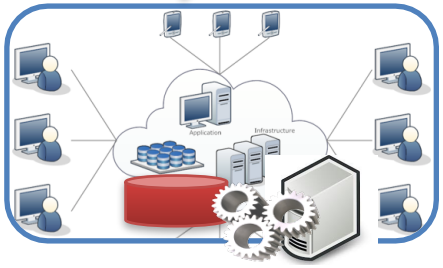
www.d4science.org

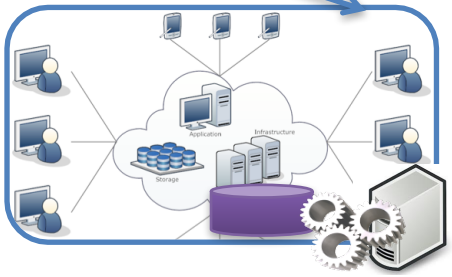


D4Science own resources

Third-party providers







+50 heterogeneous data providers, over a billion quality records
+20,000 processes/month
99,7% service availability

GBIF

OBIS OCEAN BIOGEOGRAPHIC INFORMATION SYSTEM

Copernicus Europe's eyes on Earth

EGI

sdmx Statistical Data and Metadata eXchange

WPS

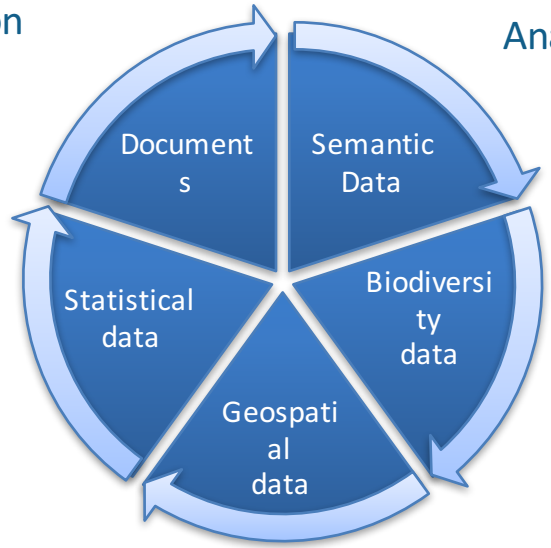
D4Science services: supporting the entire data mgmt lifecycle

Metadata generation and management

Harmonisation

Analytics

Sharing

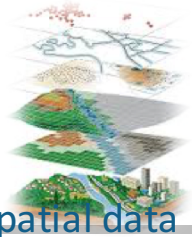


Cloud storage

Cloud computing

Multi-platform: R, Java, Fortran

Databases



Geospatial data Store

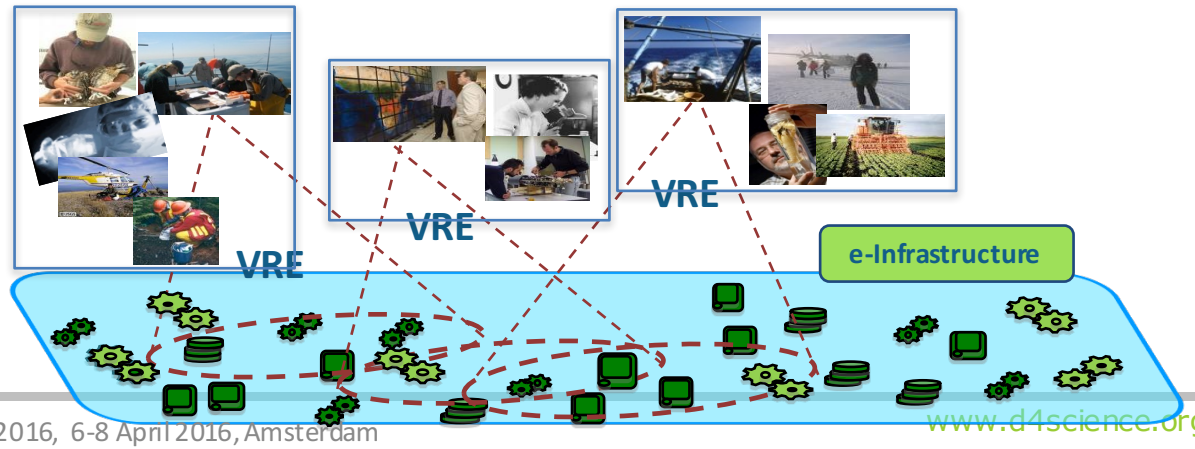
VRE as-a-Service

Virtual Research Environment

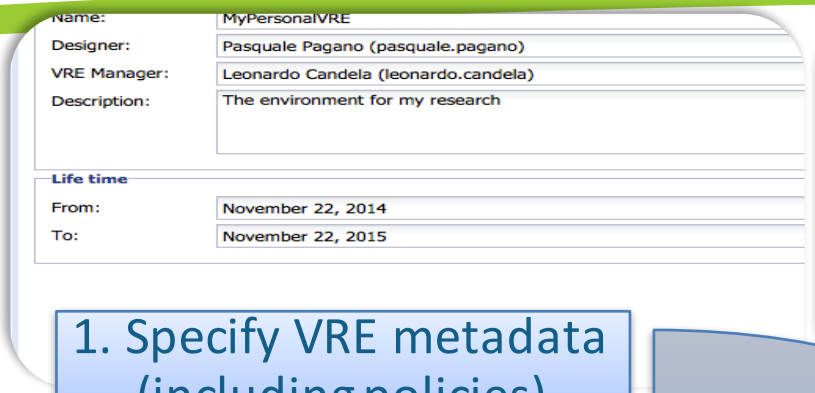
- **web-based working environment**
- providing access to services and resources tailored to serve the needs of the research team **in addressing a research question**
- **open and flexible** with respect to service offering and lifetime
- providing fine-grained **controlled sharing** of both intermediate and final research results
- **Low cost of creation and operation**

Public

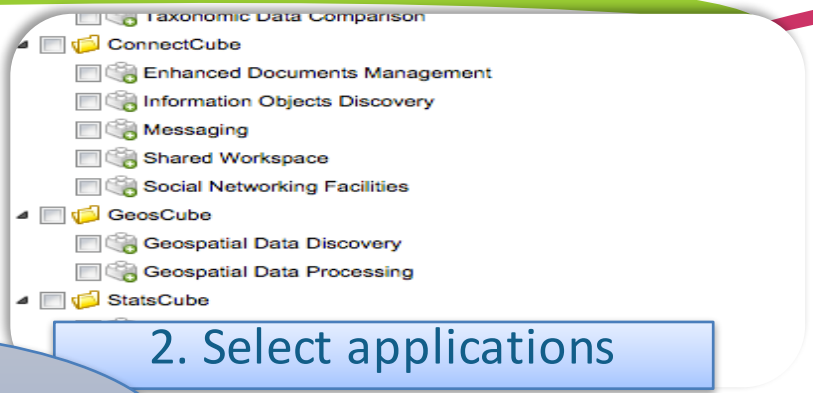
Restricted



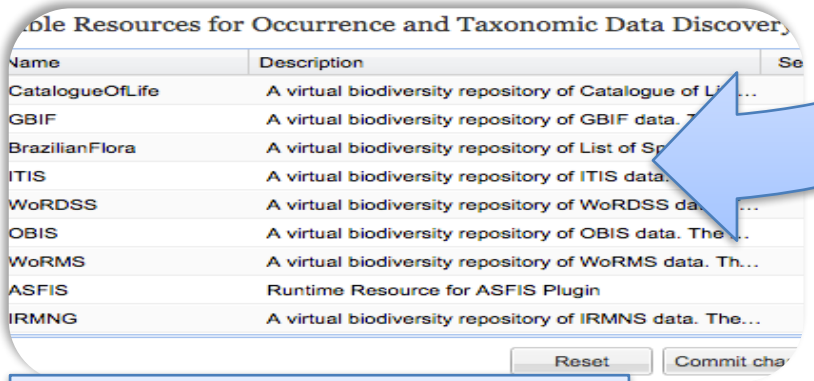
VRE Definition



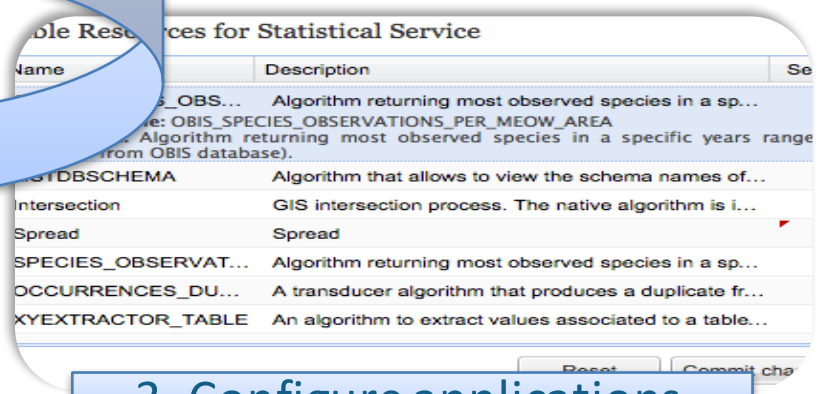
1. Specify VRE metadata (including policies)



2. Select applications



4. Select data collections



3. Configure applications

Hardware setup and software deployment completely hidden

Evolving needs of its users completely supported

D4Science offer VREs to …

Environmental Science, Marine biodiversity, Fisheries&Aquaculture science, Culture Heritage, Social data mining, Geothermal Science, Smart cities

Parthenos Access Info

SmartArea Access Info

SoBigData.eu Access Info

SoBigData.it Access Info

gCube Access Info

iMarine Access Info

Supported Projects

D4Science is supporting the operation of a series of diverse Initiatives Communities of Practice and Projects.

ARIADNE Access Info

BlueBridgeProject Access Info

DESCRAMBLE Access Info

EFG Access Info

EGIEngage Access Info

EGIP Access Info

ENVRI Access Info

ENVRIPlus Access Info

OpenIt Access Info

PGFA-UFMT Access Info

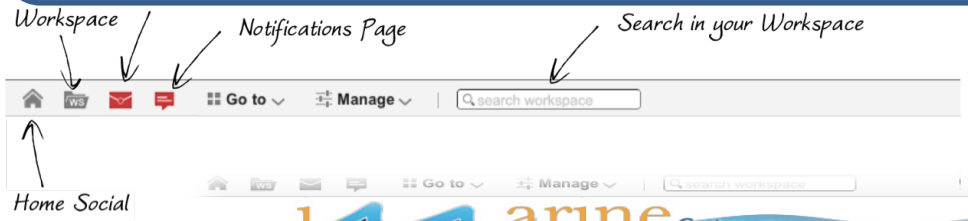
+50 VREs
2000 scientists in 44 countries

Collaborative Environment

A single point to

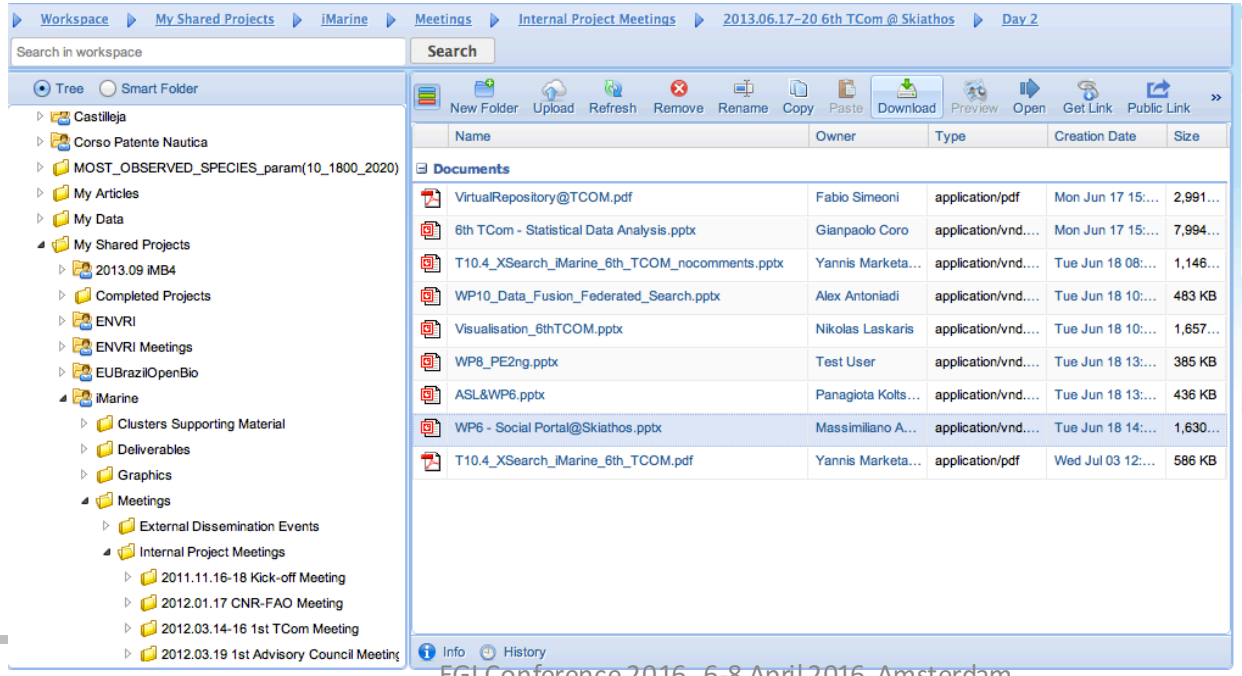
Get status and updates from applications and other users they are interested in

Get notifications about messages, jobs completion, new generated products, etc.



User Workspace

- Folders can be shared
- Including documents, datasets, software & computations



Workspace Public Link

Create links to files in your Workspace to download them. You can send the links to anyone by pasting them into Workspace Message, your emails, instant messages, etc.

Workspace Share Folders and Files

The quickest way to share something is using the Share Folder. Locate the folder with the files you want to share and then click 'Share'

Workspace Upload Files and Archives

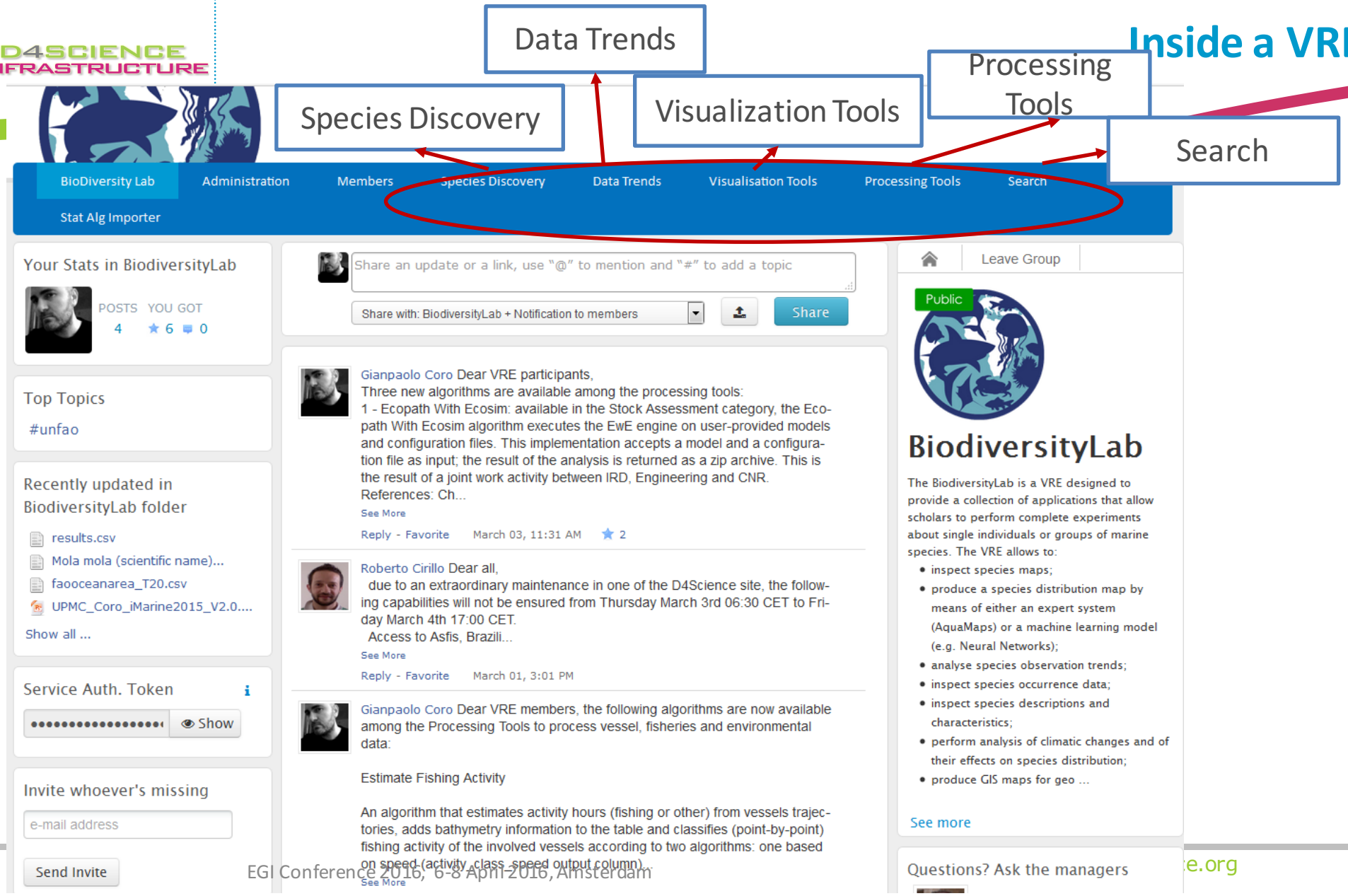
You can upload files in the Workspace in several ways:

1 – Drop your files from Desktop;

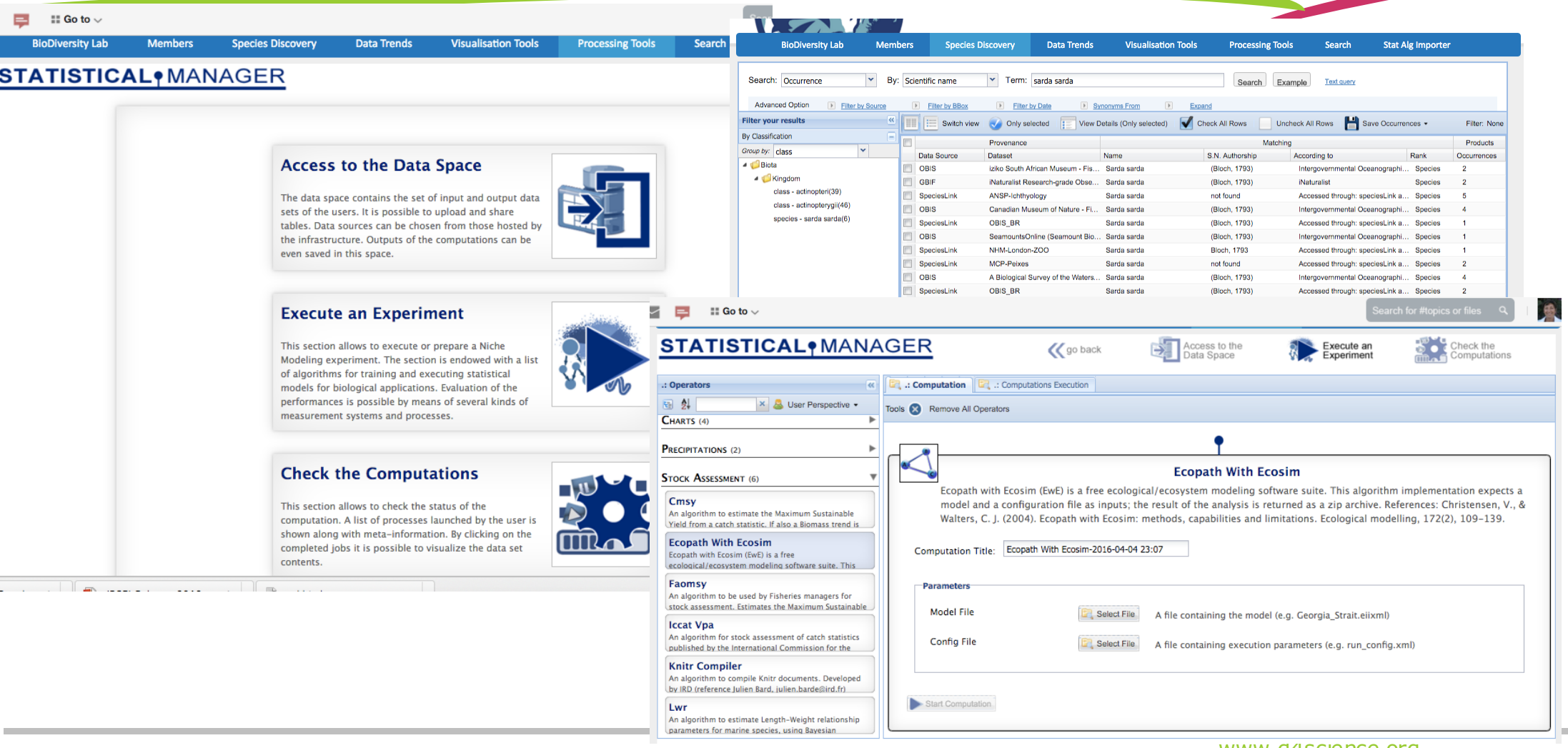
2 – Click 'Upload' and Browse Files;

3 – Upload a zip file to unzip directly its content in the Workspace.

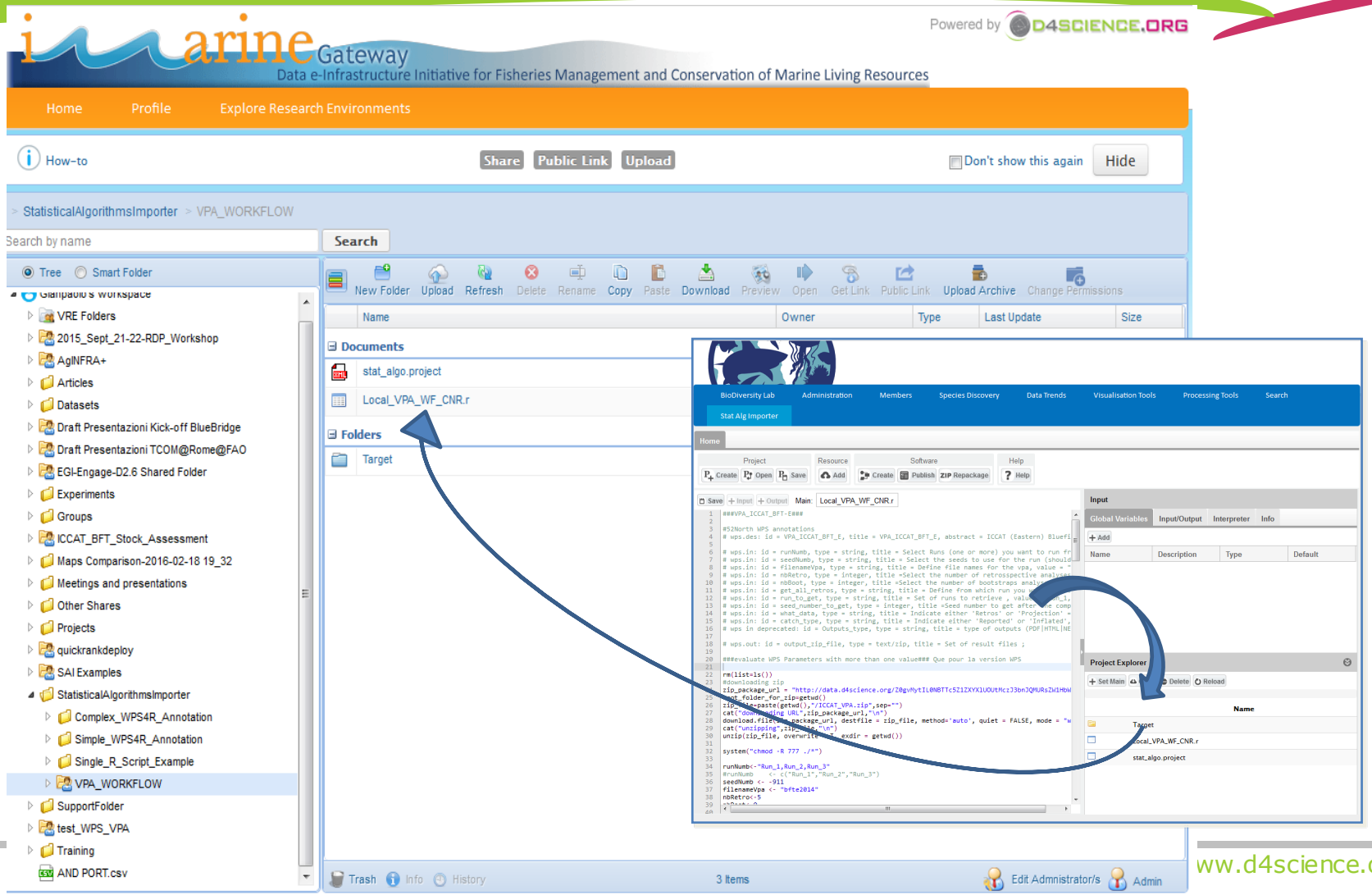
Inside a VRE


Data Trends
Species Discovery
Visualization Tools
Processing Tools
Search
BioDiversity Lab
Administration
Members
Species Discovery
Data Trends
Visualisation Tools
Processing Tools
Search
Stat Alg Importer
Your Stats in BiodiversityLab
POSTS YOU GOT
4 6 0
Top Topics
#unfao
Recently updated in BiodiversityLab folder
results.csv
Mola mola (scientific name)...
faooceanarea_T20.csv
UPMC_Coro_iMarine2015_V2.0....
Show all ...
Service Auth. Token
Show
Invite whoever's missing
e-mail address
Send Invite
Share an update or a link, use "@" to mention and "#" to add a topic
Share with: BiodiversityLab + Notification to members
Share
Gianpaolo Coro Dear VRE participants,
Three new algorithms are available among the processing tools:
1 - Ecopath With Ecosim: available in the Stock Assessment category, the Ecopath With Ecosim algorithm executes the EwE engine on user-provided models and configuration files. This implementation accepts a model and a configuration file as input; the result of the analysis is returned as a zip archive. This is the result of a joint work activity between IRD, Engineering and CNR.
References: Ch...
See More
Reply - Favorite March 03, 11:31 AM 2
Roberto Cirillo Dear all,
due to an extraordinary maintenance in one of the D4Science site, the following capabilities will not be ensured from Thursday March 3rd 06:30 CET to Friday March 4th 17:00 CET.
Access to Asfis, Brazili...
See More
Reply - Favorite March 01, 3:01 PM
Gianpaolo Coro Dear VRE members, the following algorithms are now available among the Processing Tools to process vessel, fisheries and environmental data:
Estimate Fishing Activity
An algorithm that estimates activity hours (fishing or other) from vessels trajectories, adds bathymetry information to the table and classifies (point-by-point) fishing activity of the involved vessels according to two algorithms: one based on speed (activity_class_speed output column)...
See More
Leave Group
Public
BiodiversityLab
The BiodiversityLab is a VRE designed to provide a collection of applications that allow scholars to perform complete experiments about single individuals or groups of marine species. The VRE allows to:
• inspect species maps;
• produce a species distribution map by means of either an expert system (AquaMaps) or a machine learning model (e.g. Neural Networks);
• analyse species observation trends;
• inspect species occurrence data;
• inspect species descriptions and characteristics;
• perform analysis of climatic changes and of their effects on species distribution;
• produce GIS maps for geo ...
See more
Questions? Ask the managers

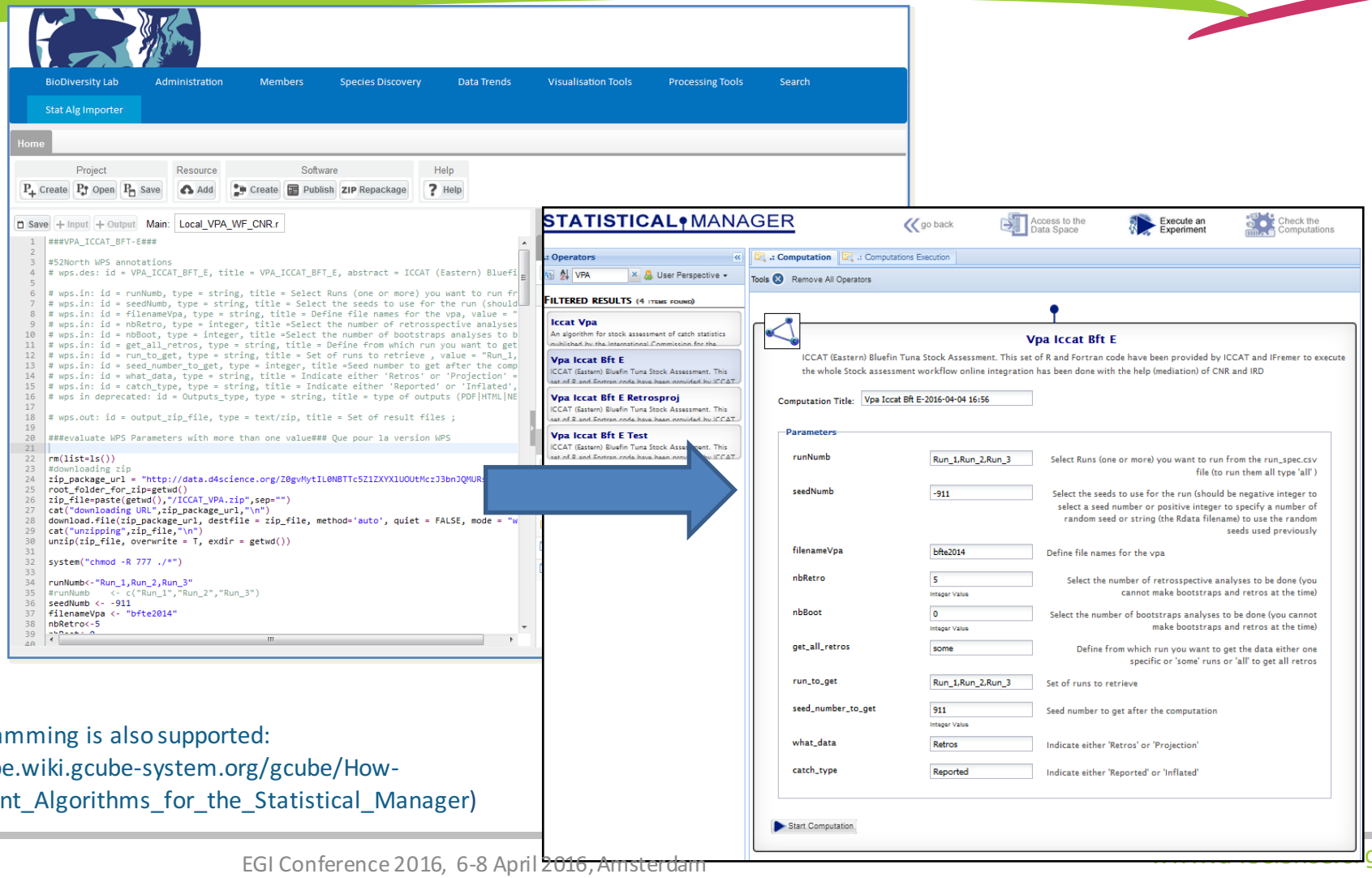
Data preparation & Processing



Store software in a personal workspace

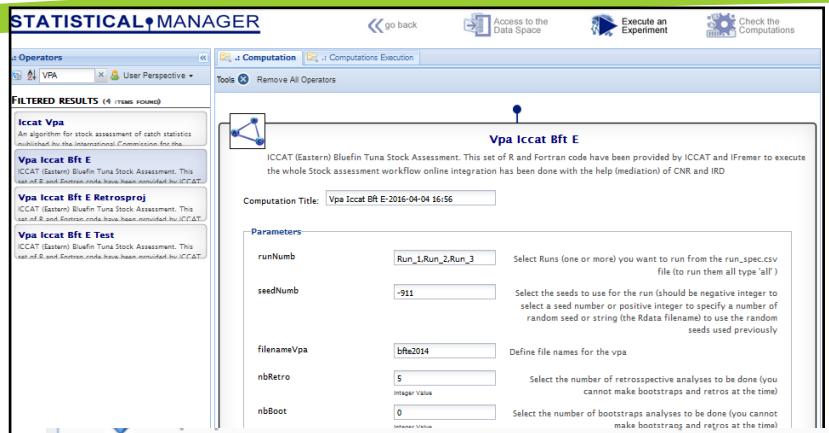


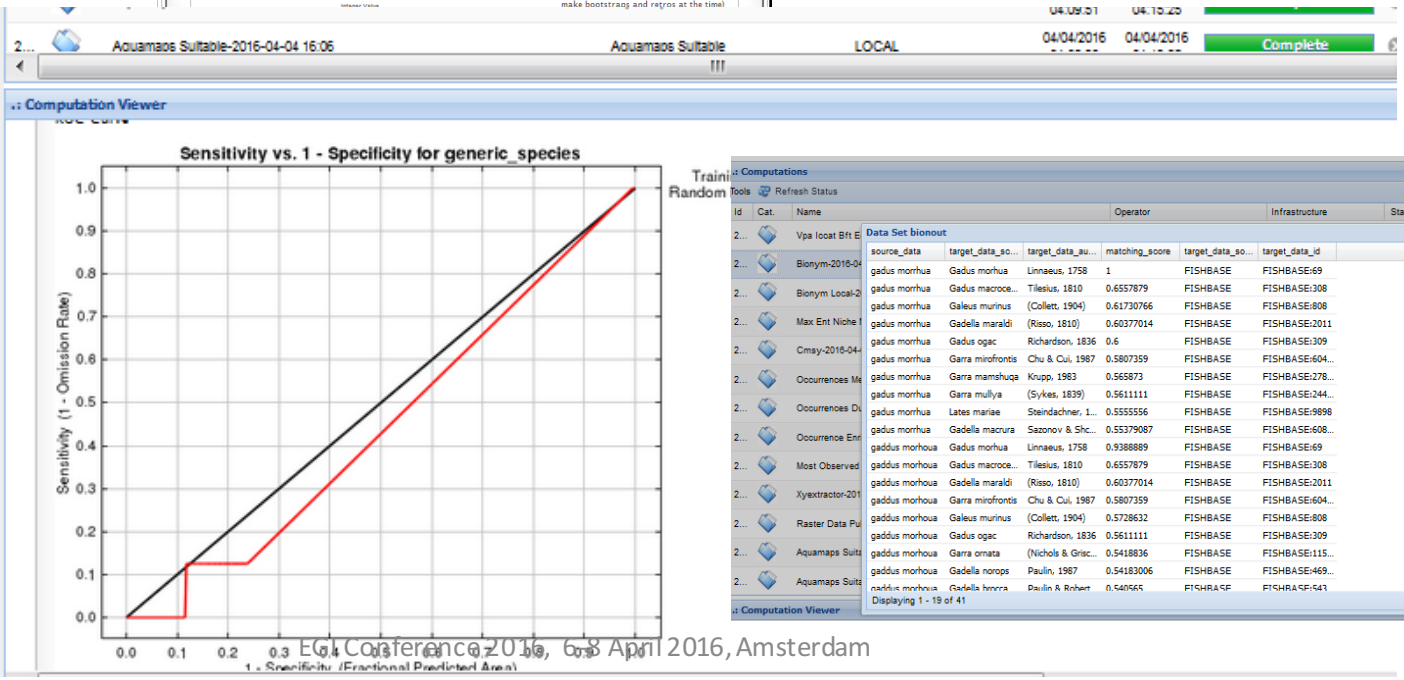
Prepare software through a Web interface



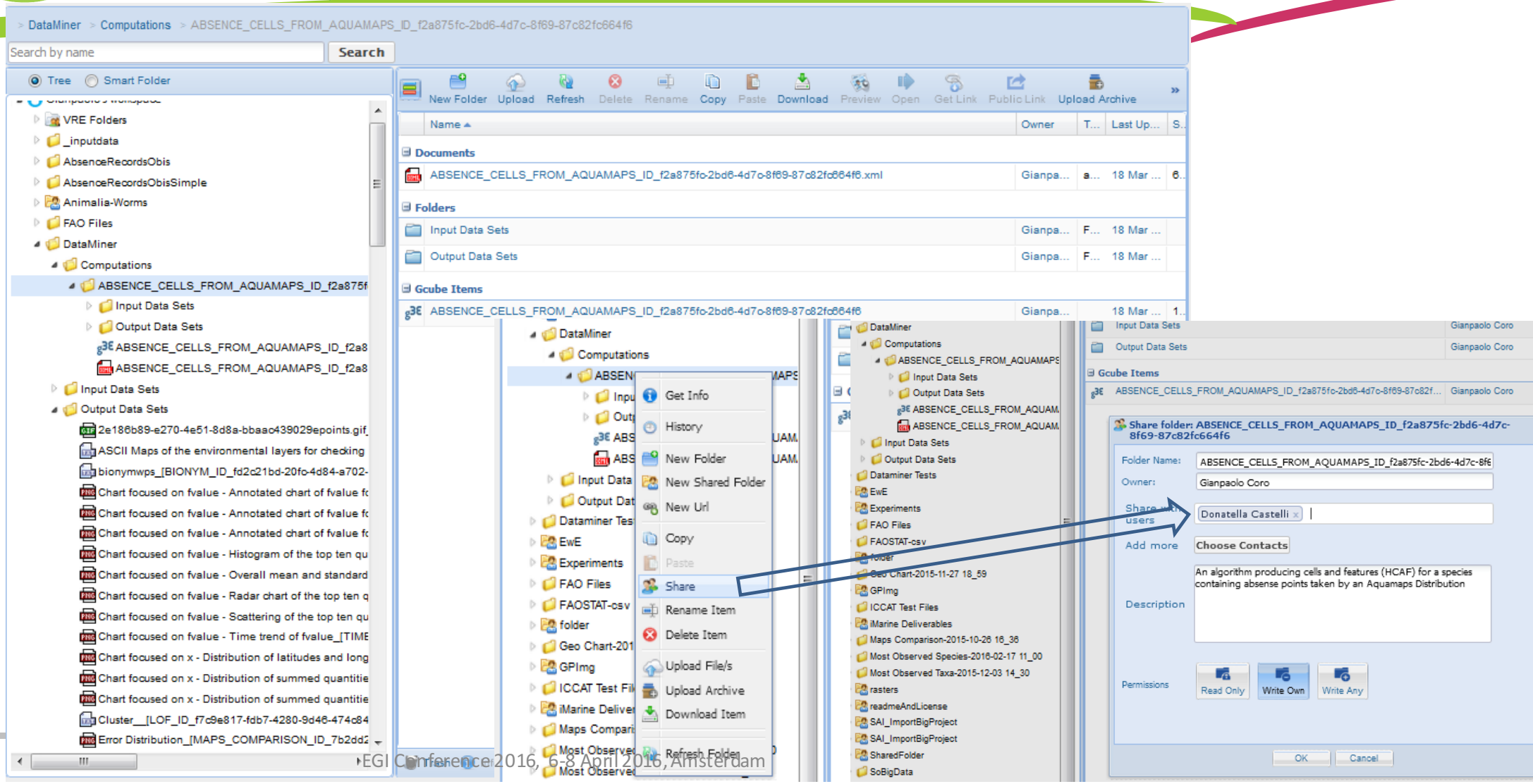
(JAVA programming is also supported: https://gcube.wiki.gcube-system.org/gcube/How-to_Implement_Algorithms_for_the_Statistical_Manager)

Execute the process and analyse the results

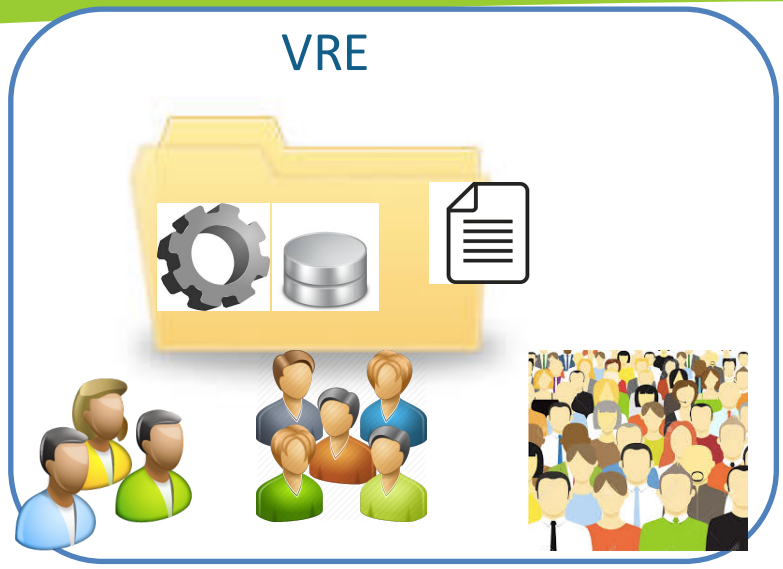




Store and share “research objects”



Infrastructure as a “Publisher”



- e-Infrastructure
- VRE–as-a-service
- Workspace &sharing

Publishing service

Reseach Activity → Review → Dissemination & access → (re-)Usage of the “research object”

www.d4science.org

www.bluebridge-vre.eu