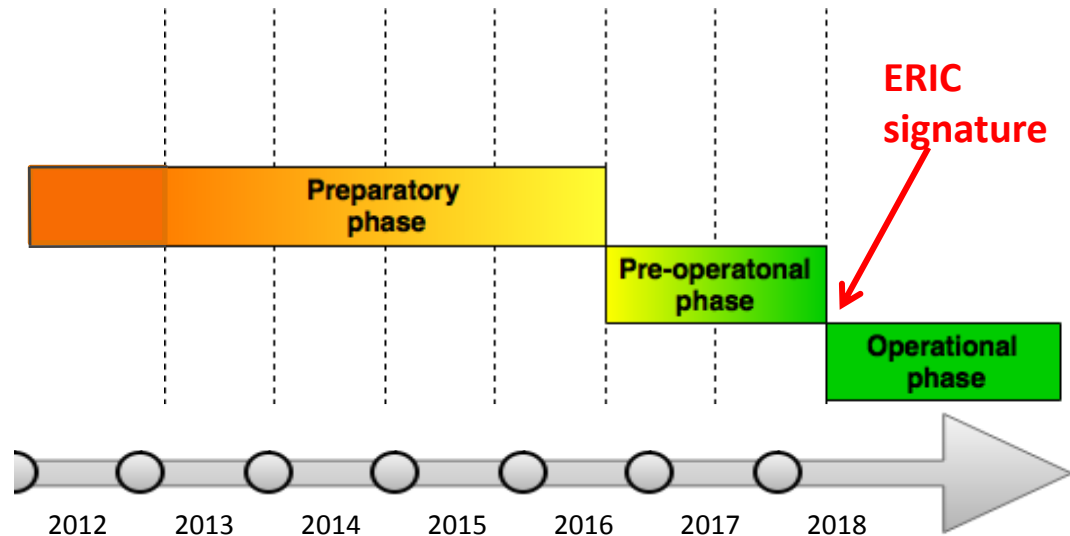


AnaEE does include experimentation and analysis on agro-ecosystems and presents valuable synergies with the phenotyping infrastructure EMPHASIS

AnaEE steps towards an ESFRI infrastructure

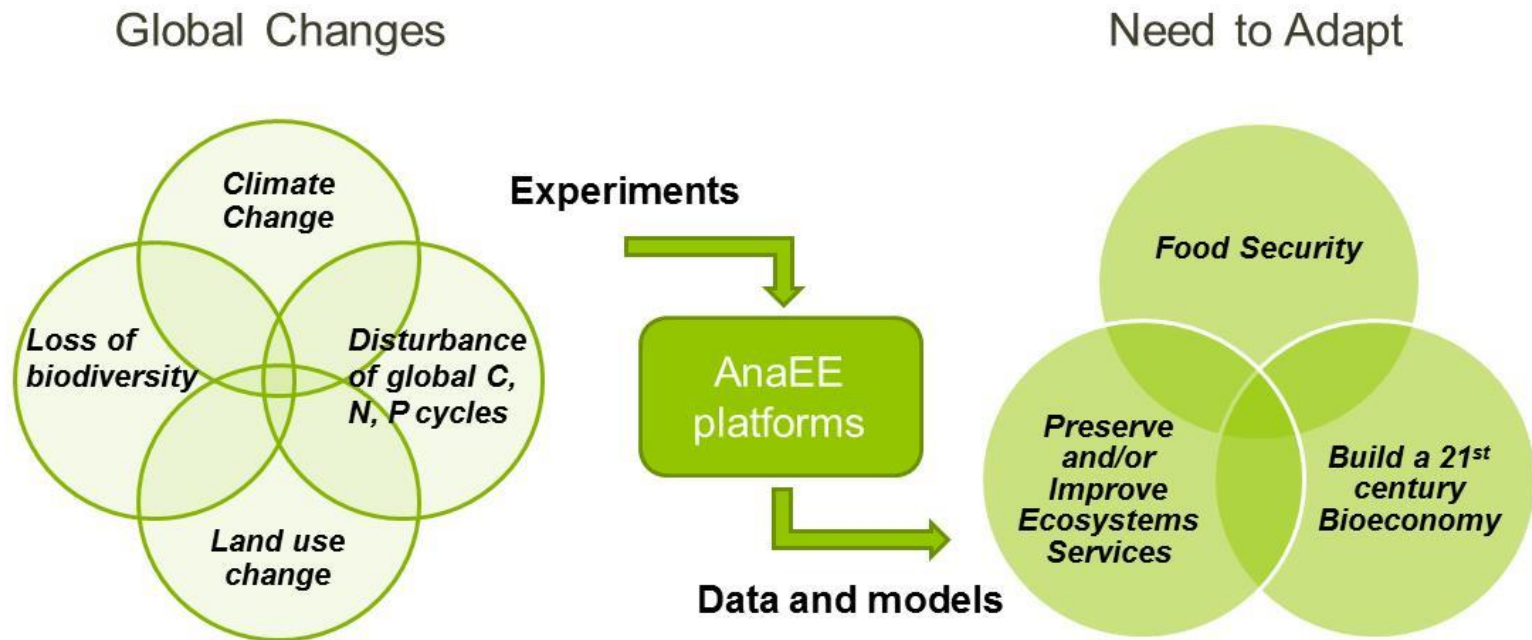


AnaEE addresses grand challenges, in particular





Food Security
Bioeconomy

under the threat of

Climate Change
C, N, P cycles disturbance



Key threats to ecosystems and AnaEE corresponding field of experimental research

| ecosystem type | threats | services affected | AnaEE research fields leading to <u>adaptation</u> and <u>mitigation</u> strategies |
|---|--|--|--|
| agricultural systems  | climate change land use change air and soil pollution soil erosion flooding soil fertility pests | food production food quality nutrient cycling carbon storage GHG emissions buffering stream water quantity and quality renewable natural resources biodiversity maintenance | agronomy agroecology soil sciences hydrology plant biology microbiology biogeochemistry Agricultural sciences |
| forests  | climate change land use change air pollution biodiversity loss invasions | timber and wood production timber and wood quality carbon storage water cycle biodiversity maintenance habitat quality leisure & tourism | ecology hydrology tree biology biogeochemistry |
| wetlands  | climate change management practices soil pollution flooding invasions | water quality habitat biodiversity GHG emissions | hydrology ecology biology of aquatic species microbiology management alternatives |
| grasslands, shrublands  | climate change land use change air and soil pollution biodiversity loss soil erosion invasions | fodder production grazing quality and quantity nutrient cycling GHG emissions buffering renewable natural resources | agroecology plant biology biogeochemistry microbiology management alternatives |

Cropping systems x environment = **AnaEE**
 Genotypes x Environment = **Emphasis**

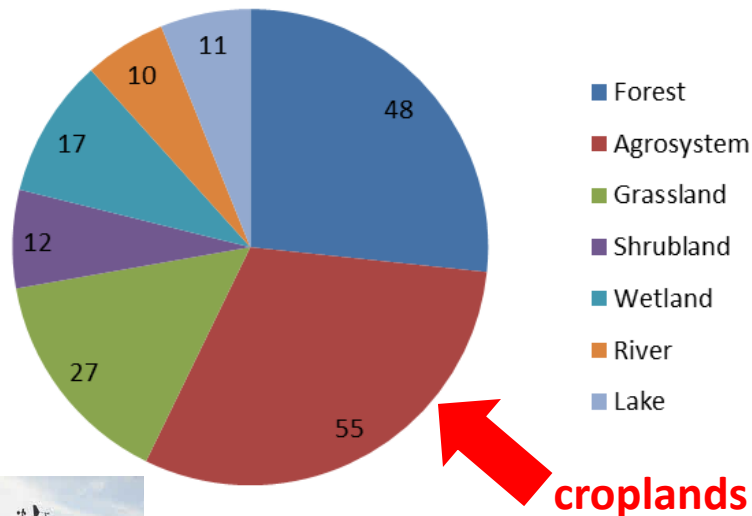
The backbone of AnaEE is **Ecosystem Experimentation**

with the majority of the platforms being field experimentation

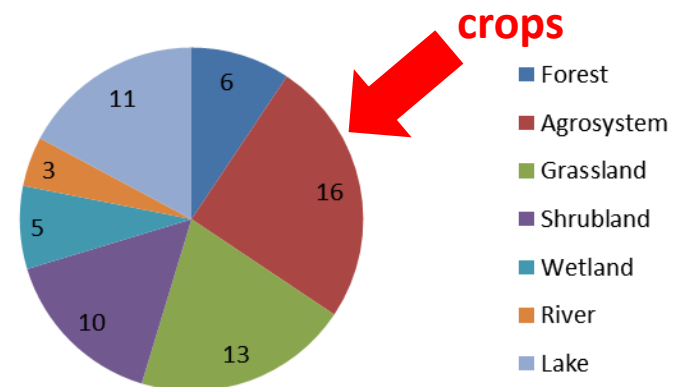
117 open-air platforms were submitted to AnaEE (2015),

96 were retained

with a majority (55) including cropland experiments



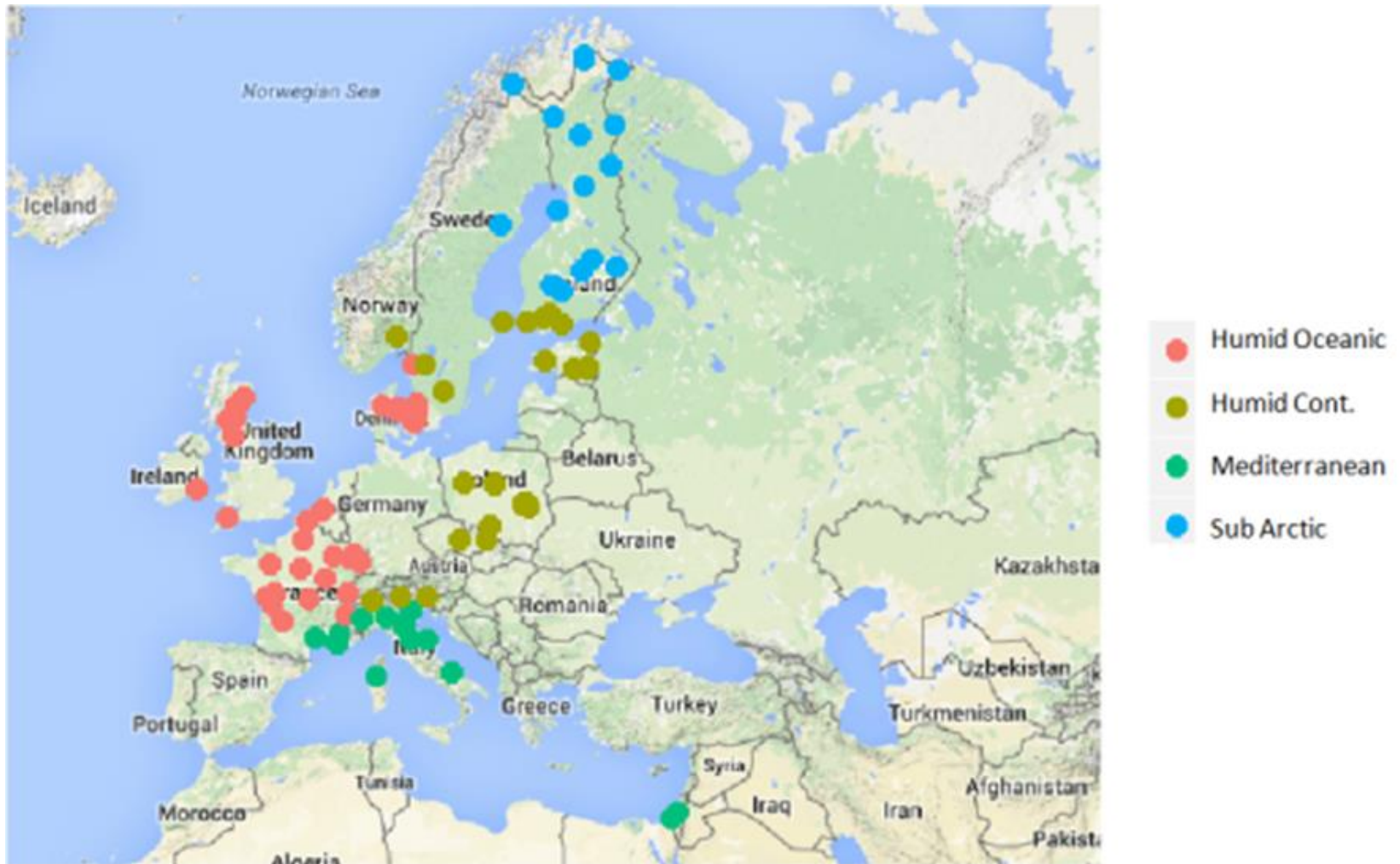
This is complemented by 28 enclosed ecosystem platforms (ecotrons, climate controlled greenhouses) **with a majority (16) running primarily crop experiments**



[Each platform (site) often have more than one experimental set-up]

145 experimental platforms covering all European climates

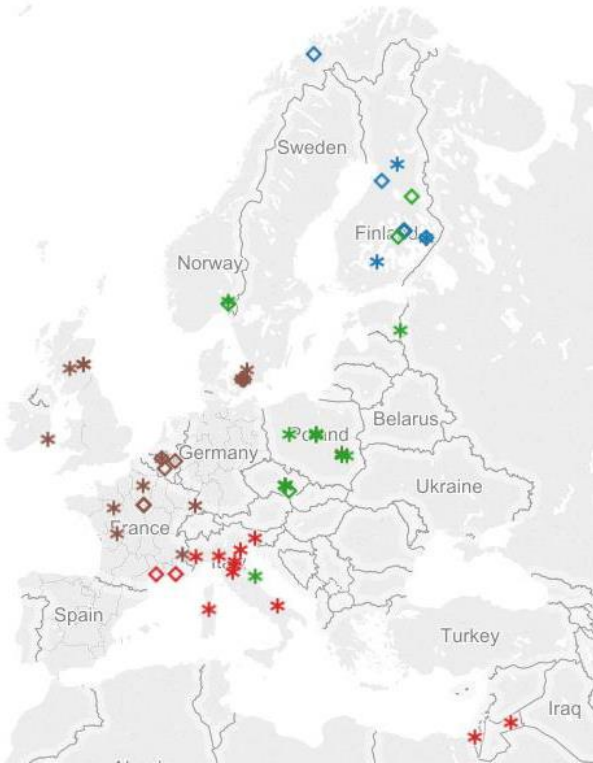
and additional platforms will be submitted from Spain, Turkey, ...
pan-European long-term experiments under real-world conditions



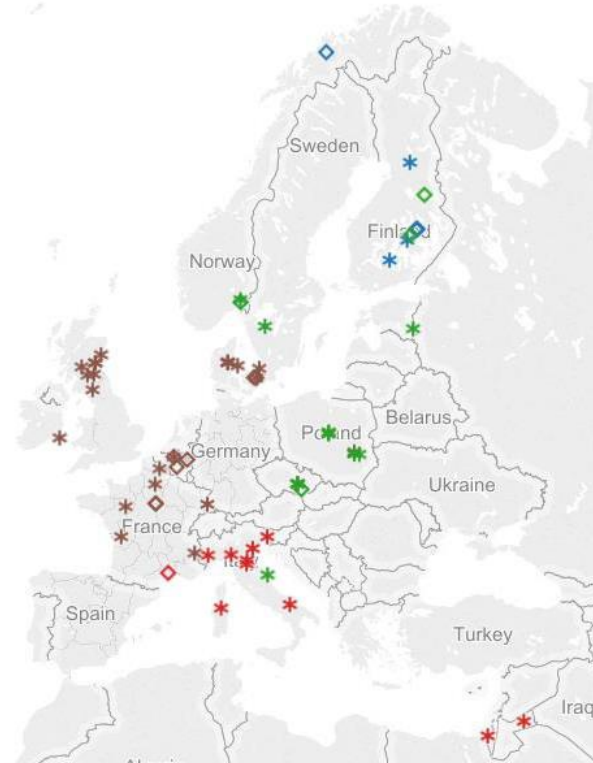
These AnaEE crop experiments cover the major drivers challenging food security
climate/CO₂ change, land use & management, pollution (N depos.)



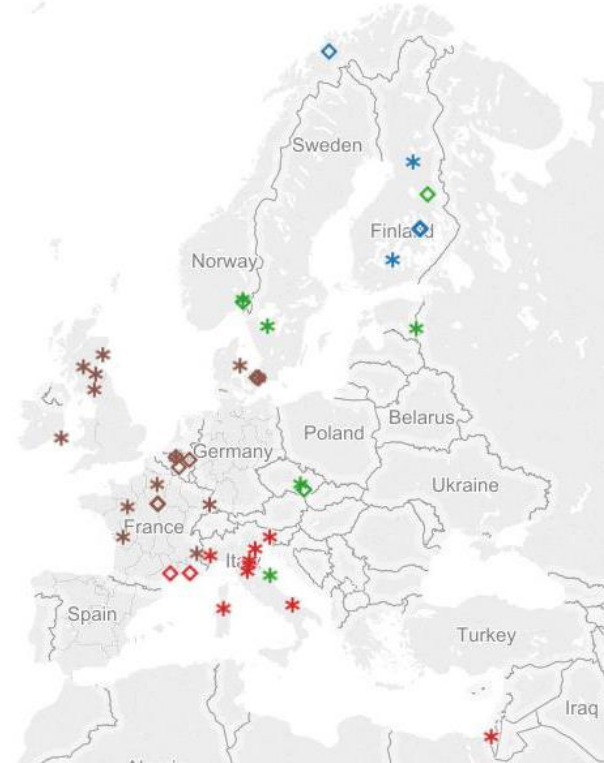
ate - Agrosystem, Climate Change



imate - Agrosystem, Land Use & Management

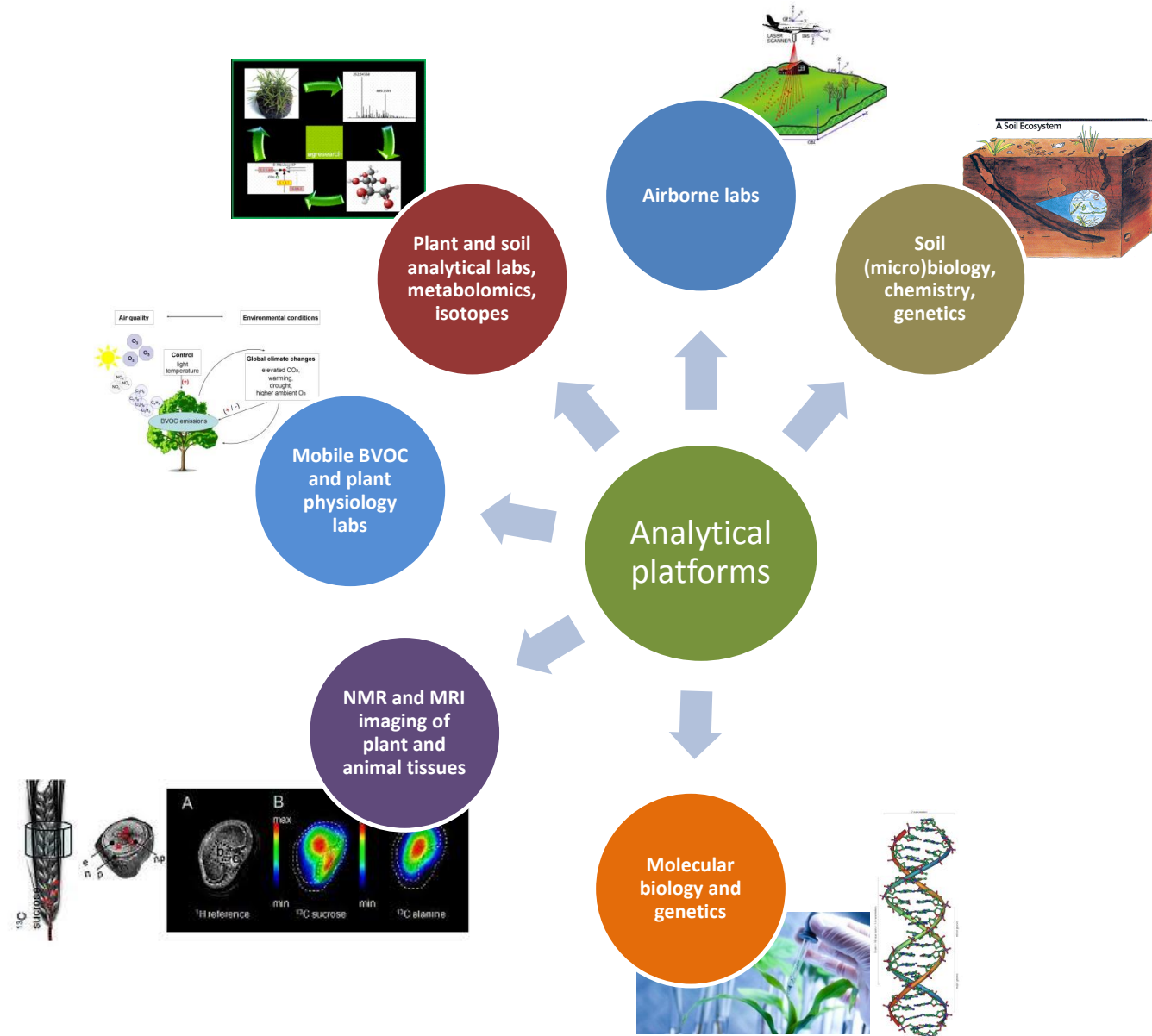


ate - Agrosystem, Pollution



The AnaEE crop experimental platforms are complemented by **analytical facilities**

- mobile or local
- NMR / MRI
- Molecular
- Chemistry
- Isotopes



Platforms not yet selected

The AnaEE crop experimental platforms are also complemented by **modelling facilities**

Model factories submitted to AnaEE

| Model factories | Hosted models | Domain of use |
|-----------------------------|--|---|
| BioMA (Italy) | CroSys, Canegro, STICS, Frost, ... | Plant developement., competition, pests dynamics energy, water, N balances OM decomposition, Soil C Soil microbial C and N |
| RECORD (France) | STICS, CERES-EGC, Sunflow, Melodie ... | |
| Crop Ensembler (Czech Rep.) | Hermes, Daisy, DSSAT, Agriclil, SoilClim, Ecamon ... | |
| Virtual SOIL (France) | ? | decomposition, soil C, soil microbial C and N, inorganic soil chemistry |

Some of the agronomy models used with the AnaEE experimental platforms

| Model | Domain of use |
|---|---------------------------------|
| Coup | SVAT, biogeochemistry |
| FASSET | farm dynamic model |
| PASIM | Grassland model |
| HydroSVAT, DSSAT-CERES, AFRCWheat, LPJ, Daisy, CLM, Dexi | Surface model (SVAT crop model) |
| Ecosse, Vsoil, Soilclim, RothC, Hydrus 2D, PhreeqC | Soil, Soil carbon |

AnaEE more than a network: added value through 4 supra-national entities

Central Hub

strategy, coordination, communication (AnaEE portal) and administration

Technology Centre

harmonization of procedures and instruments, improvement of the quality of their data, technological development, transfer of innovation

Data & Modelling Centre

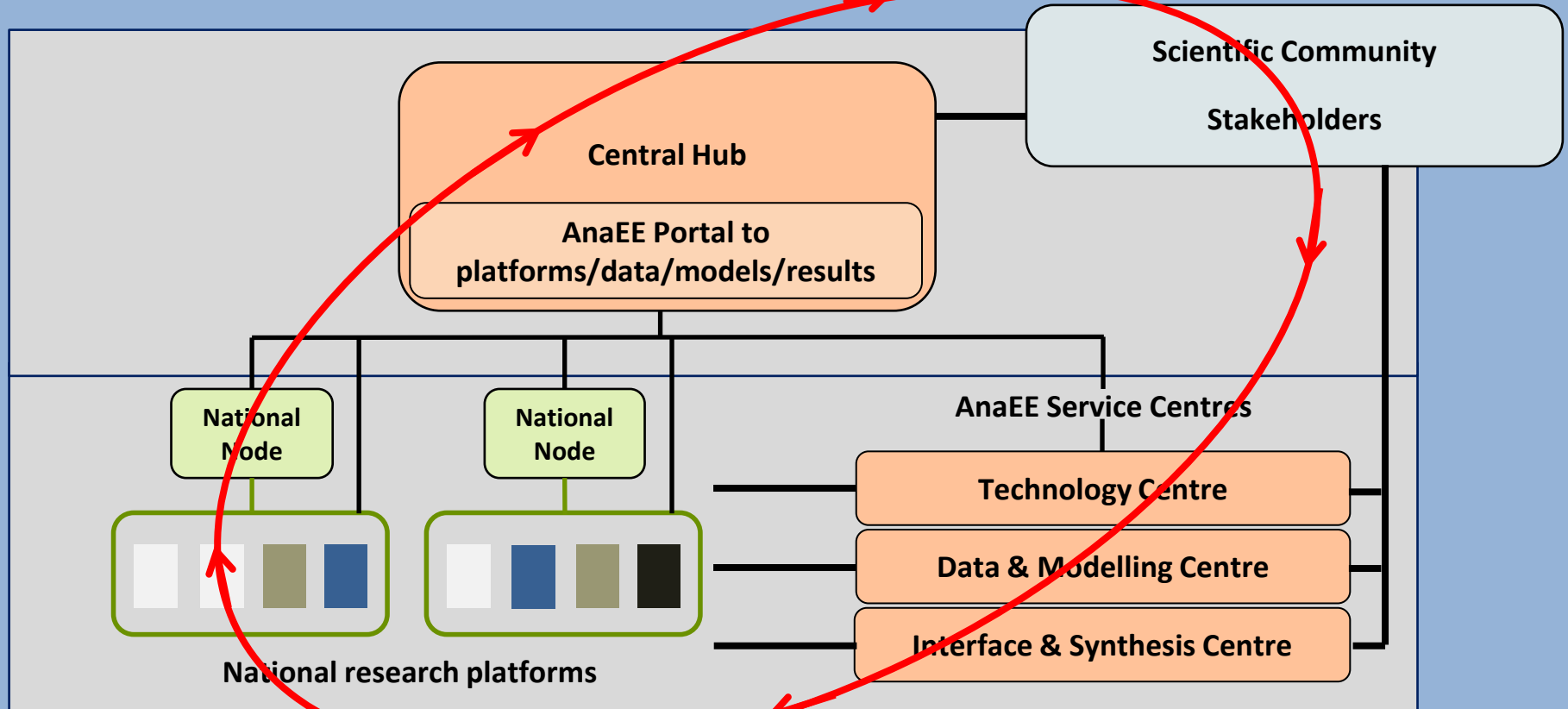
access to the data of the platforms (metadata and data standards)
access to and use of modelling solutions and models factories

Interface & Synthesis Centre

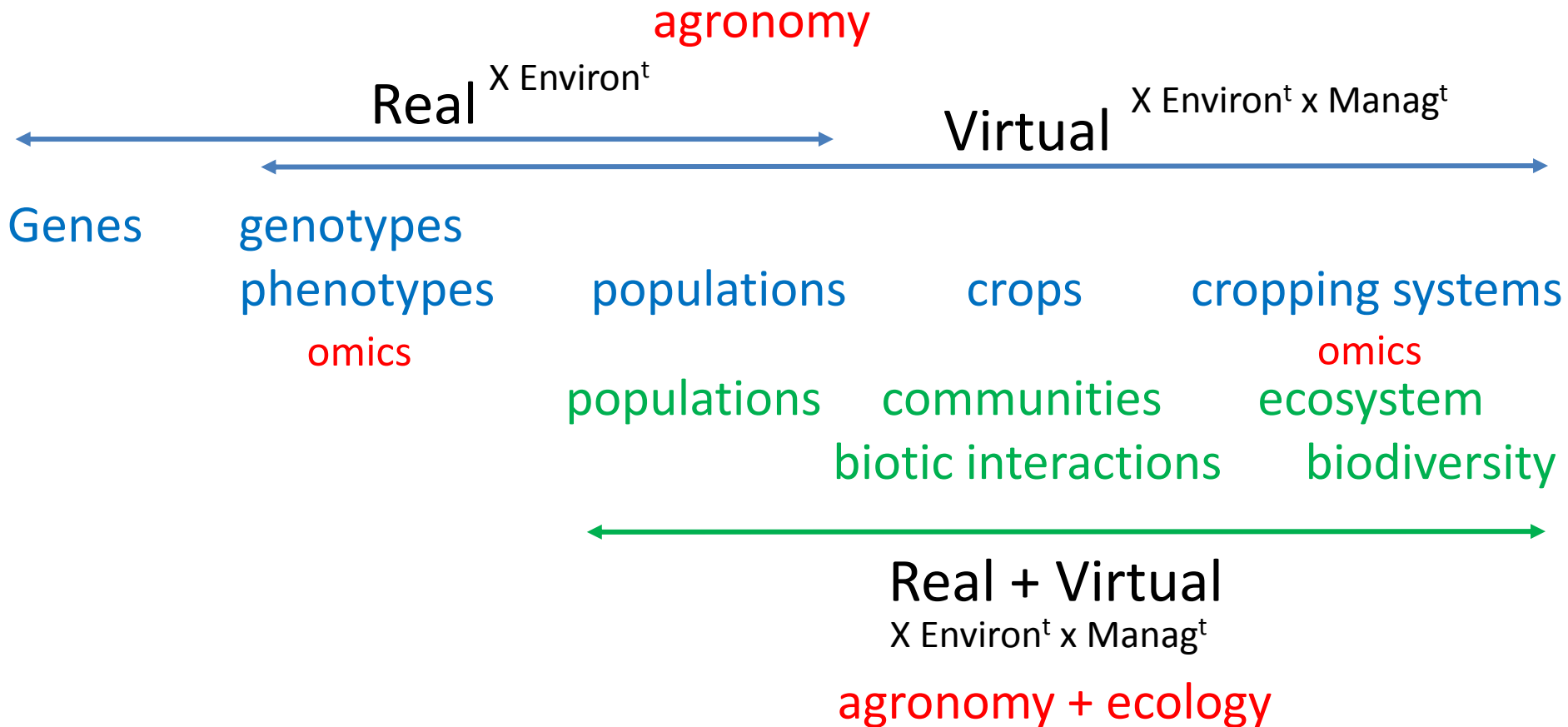
interactions with scientists (projects developments) and stakeholders;
foresight and synthesis activities; production of outreach materials

The AnaEE Central Hub & Service Centres will allow a structured development and/or circulation of:

- Methods
- Instruments
- People
- Science
- Projects
- Data
- Models
- Knowledge
- Innovations



Phenotyping (EMPHASIS) and AnaEE domains



Synergies between

AnaEE

and

EMPHASIS

Field experimental manipulations



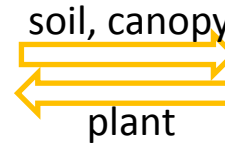
Sensors



Metadata / Data



Models modules developments



Parametrisation / Tests ecosystem models



Ecosystems services sustainability



Biotic interactions / Biodiversity



Stakeholders interactions

