



IN-SYLVA-France, the national RI for forest adaptation and forestry innovations

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CONTEXT and CHALLENGES

- **French Forest** (16.3Mha, heterogeneous, 2/3 of broadleaved)
- **Currently in a unique and unprecedented situation** (global change)
- **Has to deal with three interconnected transitions** (climate, energetic, industrial)
- **Sustainability of the production function of forest ecosystems** (increasing demand – fuel wood, bio products)
- **Carbone sequestration** (4P1000, 3S dilemma – Stocks, Sequestration, Substitution)
- **Adaptation and silvicultural innovation** (levers: genetic resource, biogeochemical cycles et silviculture)



IN-SYLVA-France is...

A multi-organisms and distributed

National Research Infrastructure

for adaptive forest management

that promotes *in-situ* forest experimentations

with *in lab* and *in silico* technologies

to help setting up innovative projects

for sustainable forest management

of temperate and tropical forests

and being a driving force the European scale.





IN-SYLVA-France is...

A National Research Infrastructure

that will **address the challenges of Global Changes** *

(sustainability of wood production, C sequestration, CC mitigation),

to answer the questions of **ecological and energetic transitions** (increased demand of fuel wood – energy, bio products),

taking into account the diversity of forest systems

* climate, biological invasions, atmospheric deposition, land use change



IN-SYLVA-France is...

More than 4 000 ha and 5 000 sites
in forest

1 site includes several treatments
(experimentation)

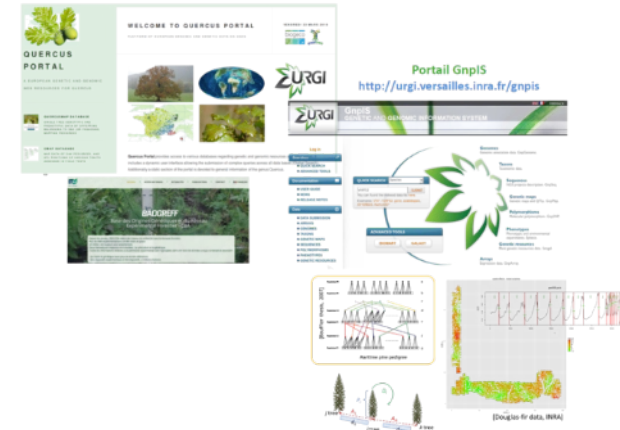
A network includes several sites on
French territory

IN-SYLVA-France
Main experiments
– high geographic
coverage

Specialized laboratories and platforms in
Functional Ecology, Biogeochemistry,
Xylosciences, Genetics, Vegetative
Multiplication

High throughput screening

Distributed Information Systems and
Modeling Tools



In-situ, in-lab et in-silico long-term facilities, recognized and supported by national partners



IN-SYLVA-France is...

An infrastructure to address research and forest management issues thanks to technological innovations

	Silviculture	Genetic	Biogeochemistry
Silviculture	<p>Forest management practices</p> <p>forest regeneration</p> <p>physiological indicators of stress</p> <p>Decision rules to adapt management practices to biotic and abiotic risks</p>	<p>Genotype x silviculture => forest services (wood, C...)?</p> <p>Ungulates => functional traits ?</p>	<p>Factors of soil sustainability</p> <p>Biogeochemical leverages for better forest resilience to global changes</p>
Genetic	<p>Choice of material for planting, Conservation of FGR</p> <p>Varietal innovation</p> <p>Assisted Migration model</p>	<p>- G x E determinism of traits?</p> <p>- Genetic architecture?</p> <p>- Phenotype prediction?</p> <p>- High-throughput phenotyping</p>	<p>Biogeochemical factors of species distribution</p> <p>=> assisted migration, matching between plantations and soil/climatic conditions.</p>
Biogeochemistry	<p>Wood harvesting and soil compaction => soil fertility?</p>	<p>Phenotype x Genotype x Env. interaction?</p> <p>spatial scale of local adaptation?</p> <p>Adaptive capacities of the FRMs = f(soil)?</p>	<p>Soil fertility remediation</p> <p>High throughput measurement of soil fertility</p> <p>Physico-chemico-biological indicators of impacts</p>



Research Question



Management Question



Technological innovation

IN-SYLVA-France is...

An infrastructure to address research and forest management issues thanks to technological innovations

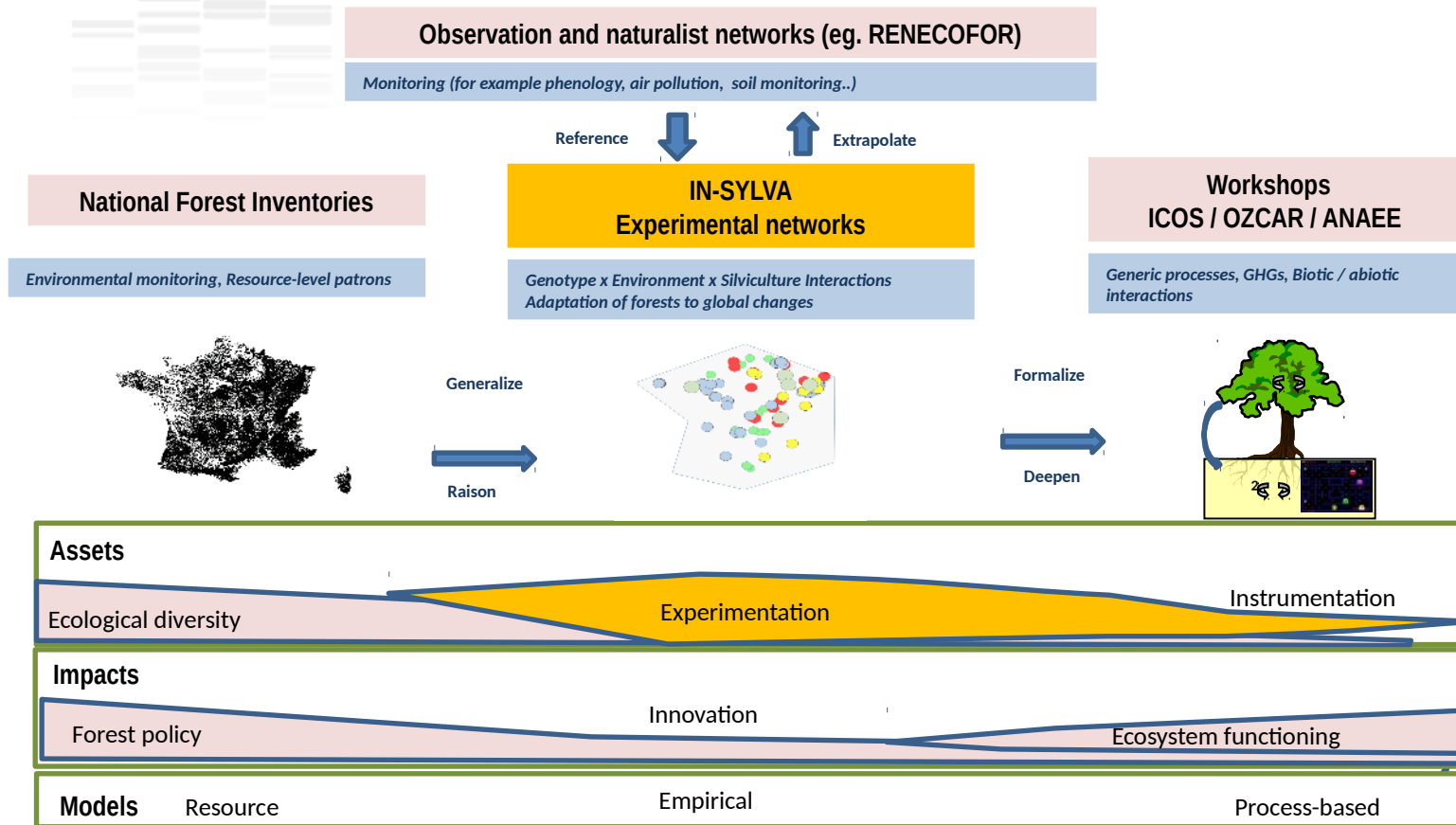
	Silviculture	Genetic	Biogeochemistry
Silviculture	Forest management practices forest regeneration physiological indicators of Decision rules to adapt practices to biotic and	Genotype x silviculture => forest services (wood, C...)? ... => functional traits ?	Factors of soil sustainability Biogeochemical leverages for better forest resilience to global changes
Genetic	Choice of material for planting, Conservation of FGR Varietal innovation Assisted Migration model	- Genetic - Phenotype prediction - High-throughput phenotyping	Biogeochemical factors of species distribution ... migration, matching ... plantations and soil/climatic conditions.
Biogeochemistry	Wood harvesting and soil compaction => soil fertility?	Phenotype x Genotype x Env. interaction? spatial scale of local adaptation? Adaptive capacities of the FRMs = f(soil)?	... fertility remediation High throughput measurement of soil fertility Physico-chemico-biological indicators of impacts

Develop models and simulator with genetic, environmental (sensu lato) and silvicultural effects

Research Question
Management Question
Technological innovation

IN-SYLVA-France is

A Research Infrastructure listed on the National road map (May 2018)

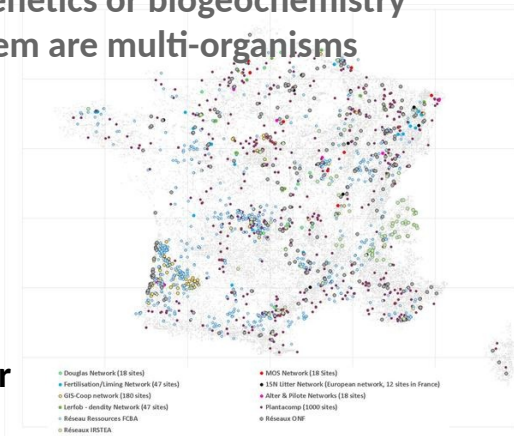


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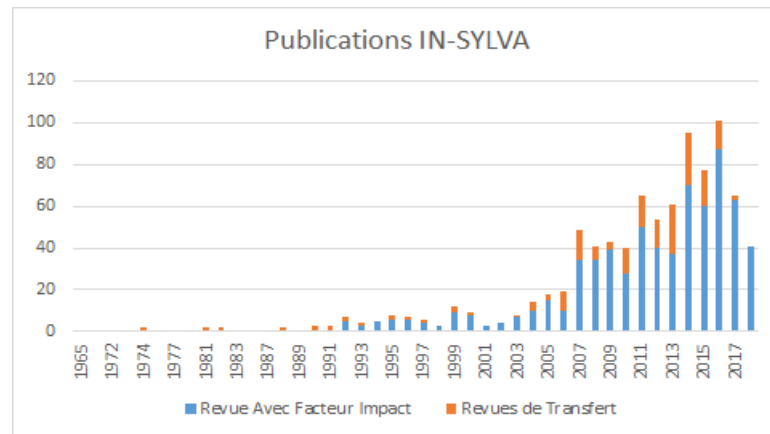
A research infrastructure that brings together all the French R & D actors involved in forest management



28 experimental networks about silviculture, genetics or biogeochemistry most of them are multi-organisms



Staff: 85 FTE
Budget: 10 M€/year
(~50% for staff)

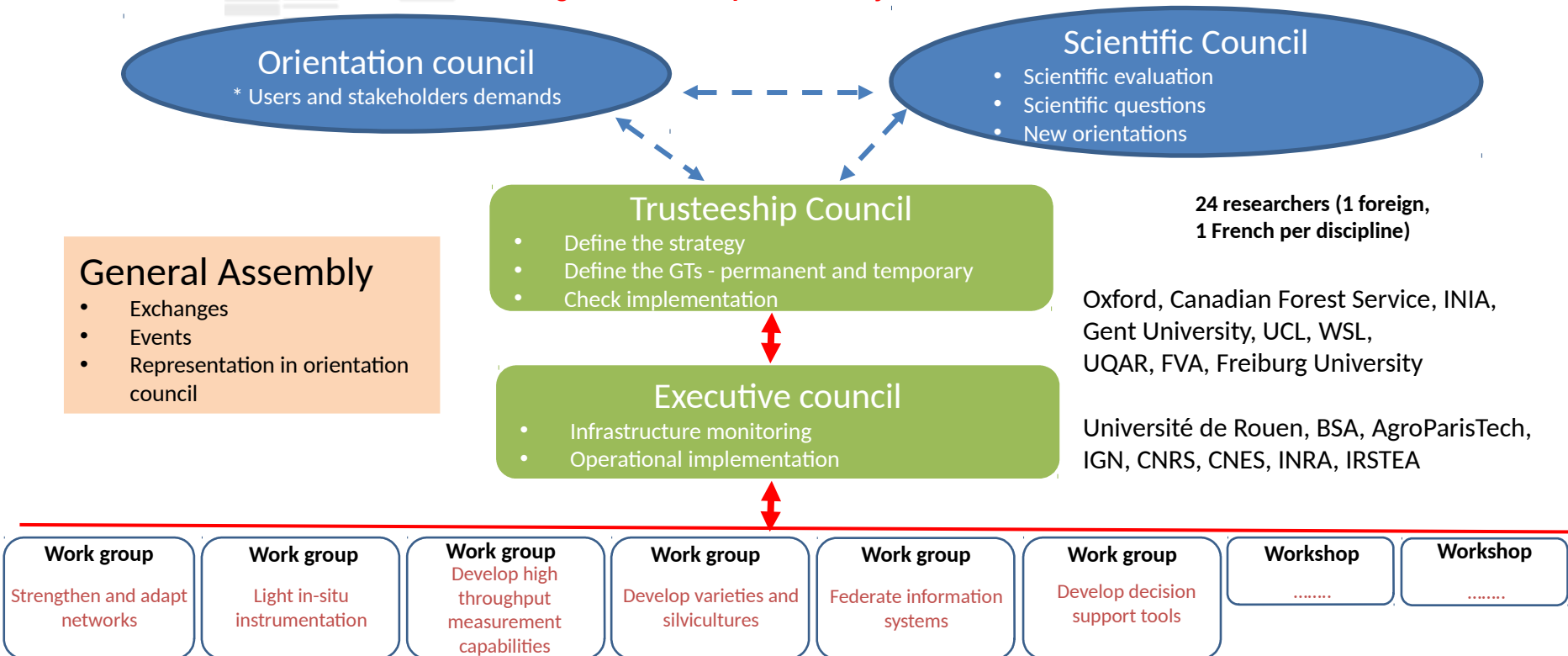


62 publications /year (of which 22% in transfer journals, Guides and reports)



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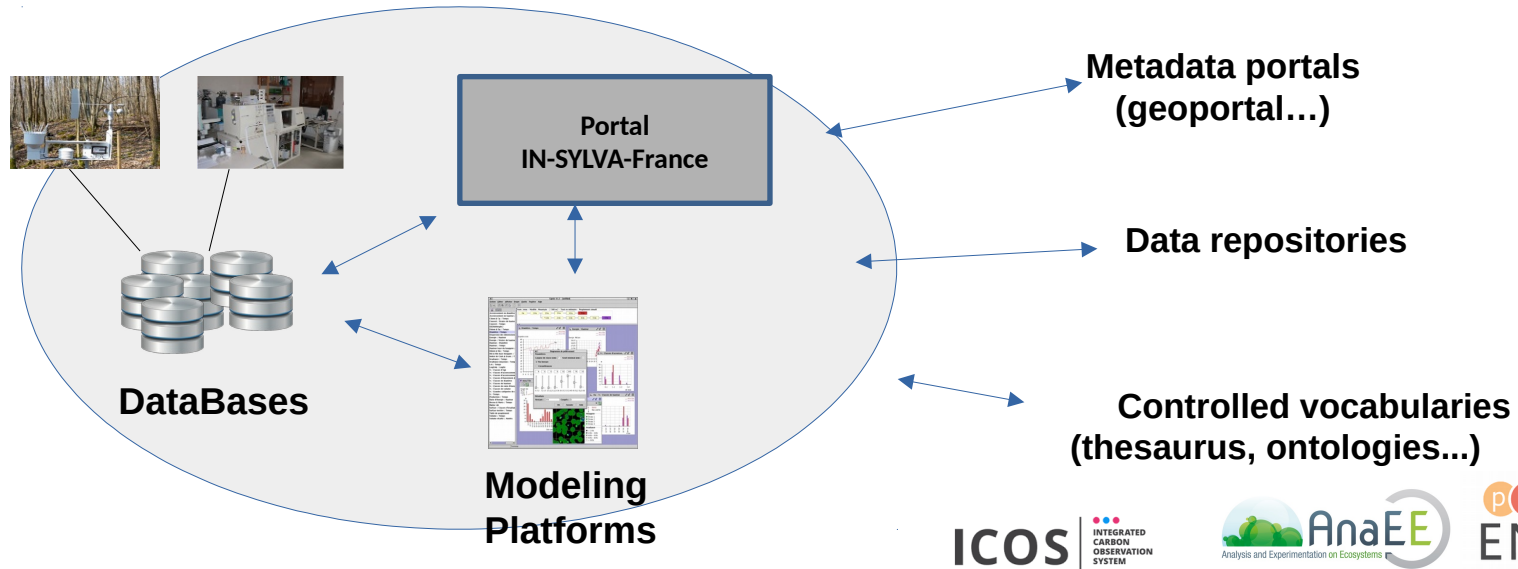
A governance adapted to IR objectives



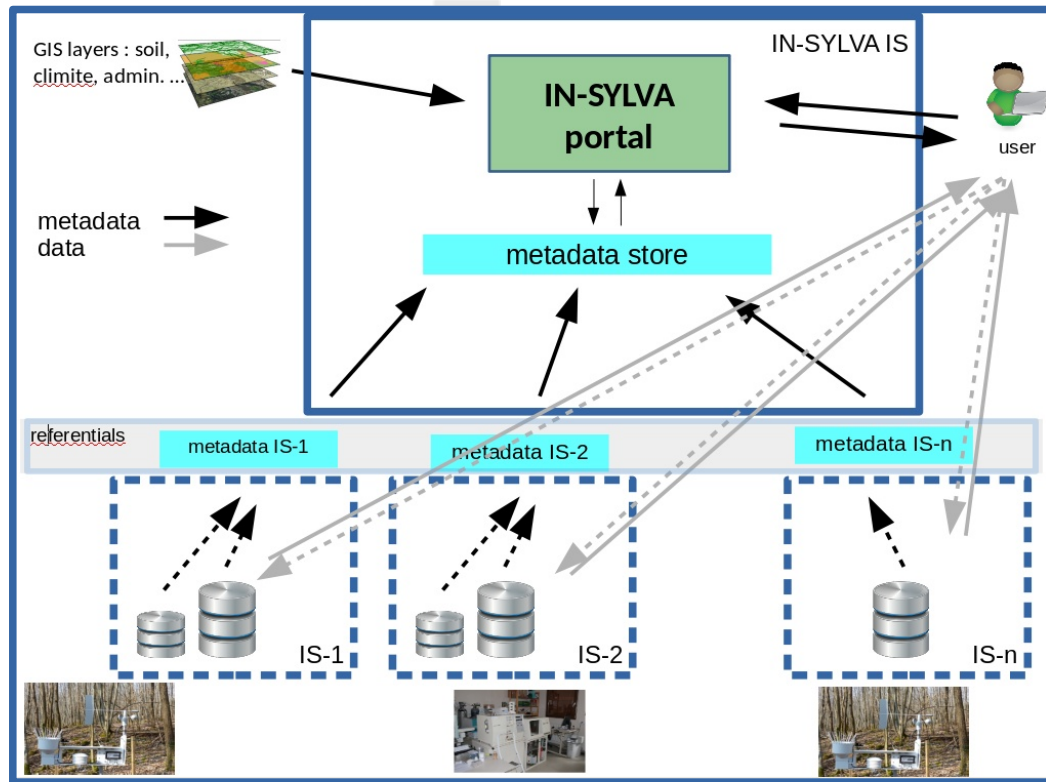
IN-SYLVA-France develops.....

An information system adapted to the objectives of the RI, a Major Issue!

with a web portal for the discovery of resources



A distributed information system for FAIR data management



- rich metadata interoperable with international standards (ISO, EML...)

- controlled vocabularies:

- * IN-SYLVA partners & networks
- * observed/measured variables
- * experimental treatments
- * taxon
- * units

- shared within IN-SYLVA community

- connected to IS of other env. RI

- open to the world for research and management

IN-SYLVA-France

- brings together resources for silviculture, genetics and biogeochemistry experimentations
- develops innovative solutions
- brings to knowledge existing resources including data from experimentations
- develops data/metadata interoperability
- is for researchers, forest managers, policy makers, education... and citizens
- contributes to Open Science
- as the French national component to future EU and international RI



The web site of IN-SYLVA-France

<https://www6.inra.fr/in-sylva-france/>

Présentation Organisation Services Accès aux métadonnées & données Publication IN-SYLVA en action ! Formation Espace sécurisé

Accueil



IN-SYLVA France

IN-SYLVA-France est une infrastructure nationale regroupant les dispositifs de recherche des Établissements travaillant sur la gestion forestière.

Elle constitue une réponse aux enjeux socio-économiques et environnementaux rappelés dans le PNFB: adaptation des forêts aux changements globaux, emplois via l'innovation sylvicole, adéquation amont-aval dans les filières. Son originalité est de coupler les leviers sylvicoles, biogéochimiques et génétiques pour favoriser une vision intégrée de la sylviculture et d'élaborer une gestion adaptative et durable des peuplements forestiers.

IN-SYLVA fédère les réseaux d'expérimentation étudiant les interactions entre pratiques x ressources génétiques x environnement ainsi que des plateformes analytiques caractérisant le climat, les sols et le matériel végétal à haut-débit.

IN-SYLVA-France structure ces réseaux, les renforce et fait évoluer les équipements et les systèmes d'information associés.

IN-SYLVA-France procure des services en matière de développement (ex : choix de provenances et d'espèces, itinéraires et trajectoire des systèmes sylvicoles), de formation académique et continue (démonstrateurs).

IN-SYLVA-France ambitionne de placer la France comme leader européen de la gestion forestière, contribuant ainsi au rayonnement économique de la filière

Actualités

- > 3 Juillet 2018 : Rencontre au MAA à Paris
- > 13 Juin 2018 : Réunion des groupes de travail
- > 17 mai 2018 : Publication de la feuille de route nationale des Infrastructures de recherche
- > Avril et Mai 2018 : mise en place des groupe de travail
- > Avril 2018 : Mise en ligne du site web
- > Mars 2018 : In-Sylva France sur la feuille de route des Infrastructures Nationales
- > 5 Février 2018 : Lancement du projet In-Sylva France

