AQUAEXCEL and AQUAEXCEL2020: Research infrastructures projects for the benefit of European aquaculture

Marc Vandeputte

AQUAEXCEL and AQUAEXCEL^{2020}: RESEARCH INFRASTRUCTURE PROJECTS FOR THE BENEFIT OF EUROPEAN AQUACULTURE

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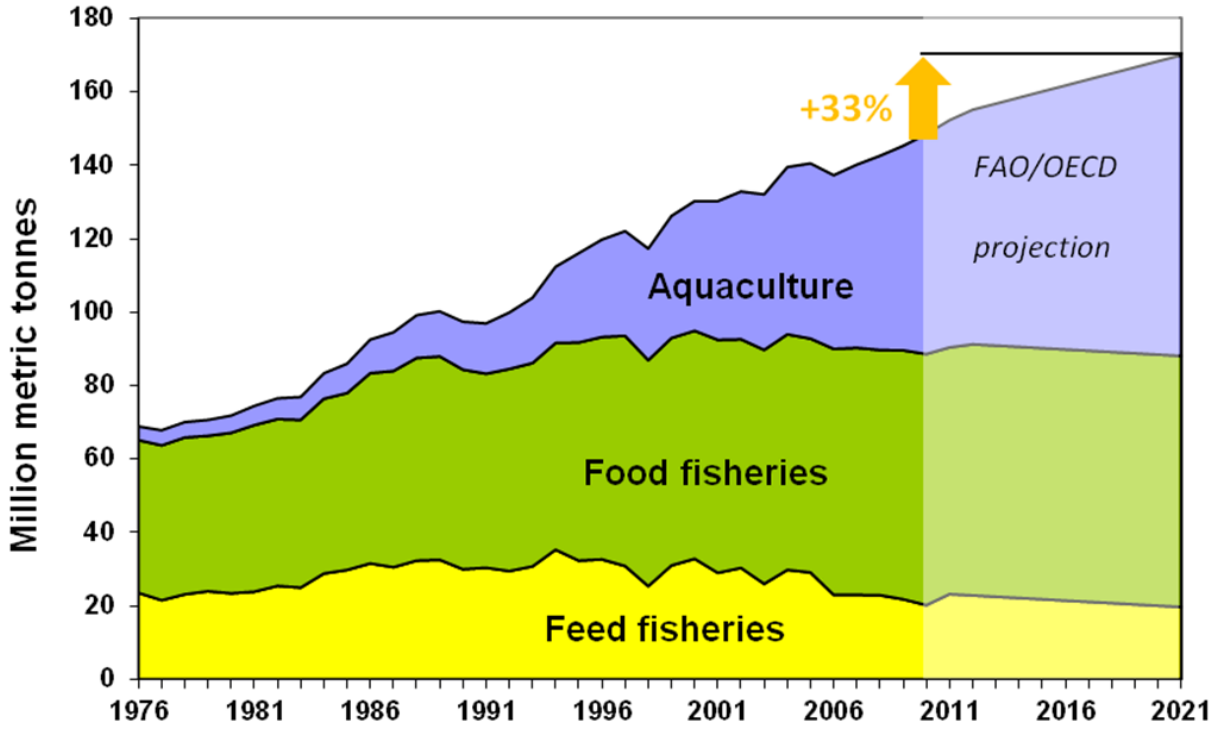
Aquaculture: a growing challenge



EU level: production is now stagnating and 85% of seafood is imported

➔ EU strategy to develop aquaculture production

➔ Research to improve competitiveness and sustainability

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AQUAEXCEL^{2020} – At a glance

Aquaculture Infrastructures for Excellence in European Fish Research (towards 2020)

AQUAEXCEL	AQUAEXCEL^{2020}
2011-2015 (4 years)	2015-2020 (5 years)
17 partners, 27 facilities	22 partners, 39 facilities
9.2 M€ grant	9.7 M€ grant

Main goal: to integrate and open the key aquaculture research infrastructures in Europe, covering all EU fish culture systems and competences

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Types of activities

Transnational Access (TNA): Give ‘free of charge’ access to the world-class infrastructures and resources of the consortium

Networking Activities (NA): Co-ordinate partners infrastructures (resource and know-how sharing, communication) and give visibility

Joint Research Activities (JRA): Joint R&D to improve the services provided by the infrastructures

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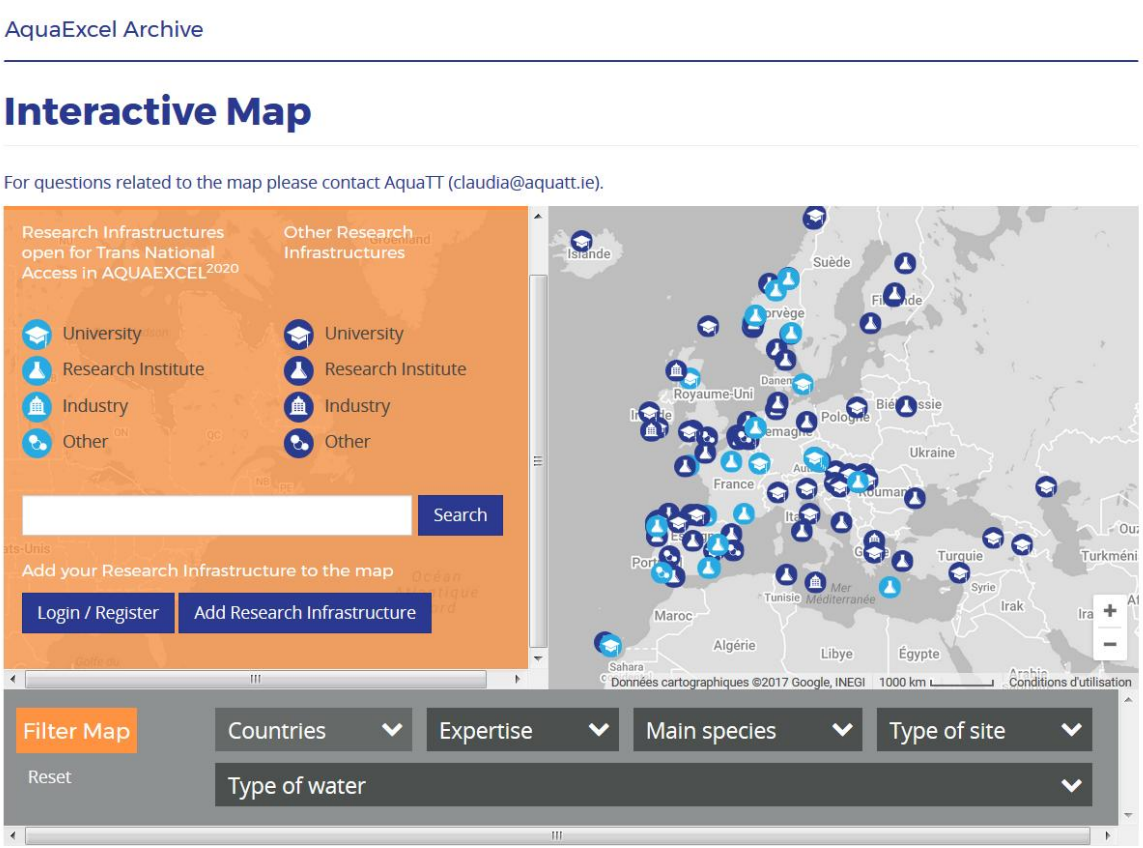
AQUAEXCEL Networking activities

The RI Map on www.aquaexcel2020.eu



Currently 108 entries

Interactive menu

Searchable

Detailed information available

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AQUAEXCEL Networking activities

ATOL / EOL ontologies

+ measurement methods for 63 major traits

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AQUAEXCEL Networking:

training courses

RAS technology @ Wageningen

Aquaculture Genomics @ INRA

Chromosome manipulations @ Stirling

New Monitoring Tech @ NTNU

Extended in AQUAEXCEL^{2020}

9 courses in total

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AQUAEXCEL Joint research

Access your infrastructure from your living room

NOFIMA

IMARES

SINTEF/ACE

WUR

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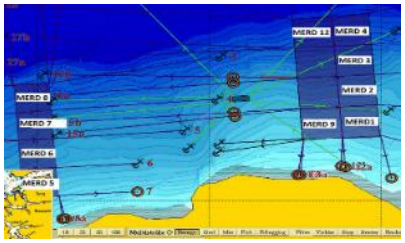
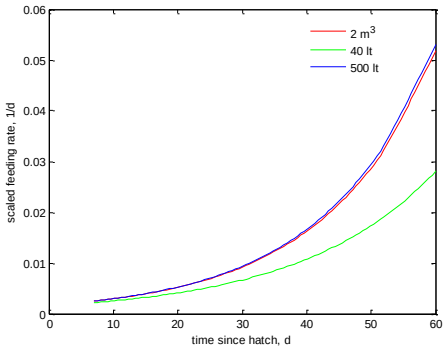
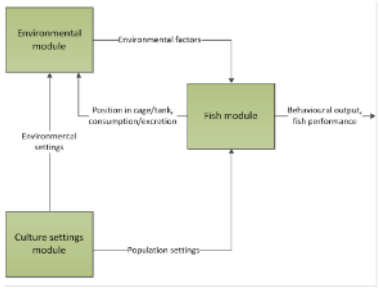
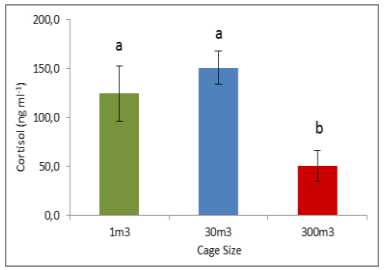
AQUAEXCEL Joint research

Effect of experimental unit size on results









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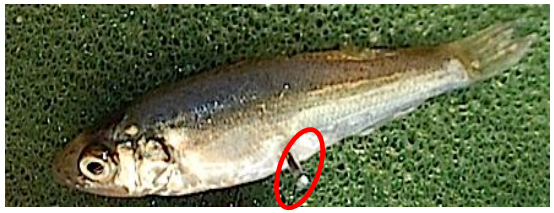
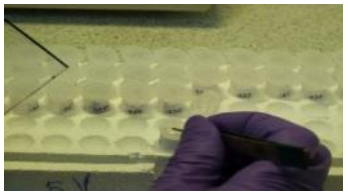
AQUAEXCEL Joint research

Early individual tagging of sea bass and sea bream



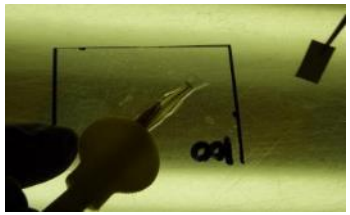
Insertion of the NonaTec tag in the abdominal cavity of a 400 mg juvenile seabass

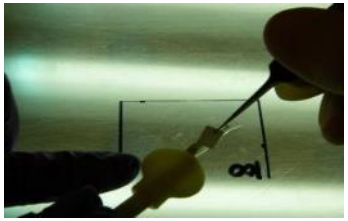
➔Survival OK for BW>400 mg
➔No effect on growth
➔Effect on swimming behaviour (disappears after 42 days)
➔ Reading success >80%



Sampling of the caudal fin for DNA collection

➔Survival OK
➔DNA collected starting 71 dpf (43 mg)
➔DNA quality/quantity OK for routine genotyping for fish> 87 dpf (248 mg)





Sampling mucus on Whatmann paper and storage at -20°C

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AQUAEXCEL Joint research

Isogenic fish lines: the lab mouse of fish research

Already there:

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AQUAEXCEL transnational access

136 projects submitted ➔ 97 financed

170 projects foreseen in AQUAEXCEL^{2020}

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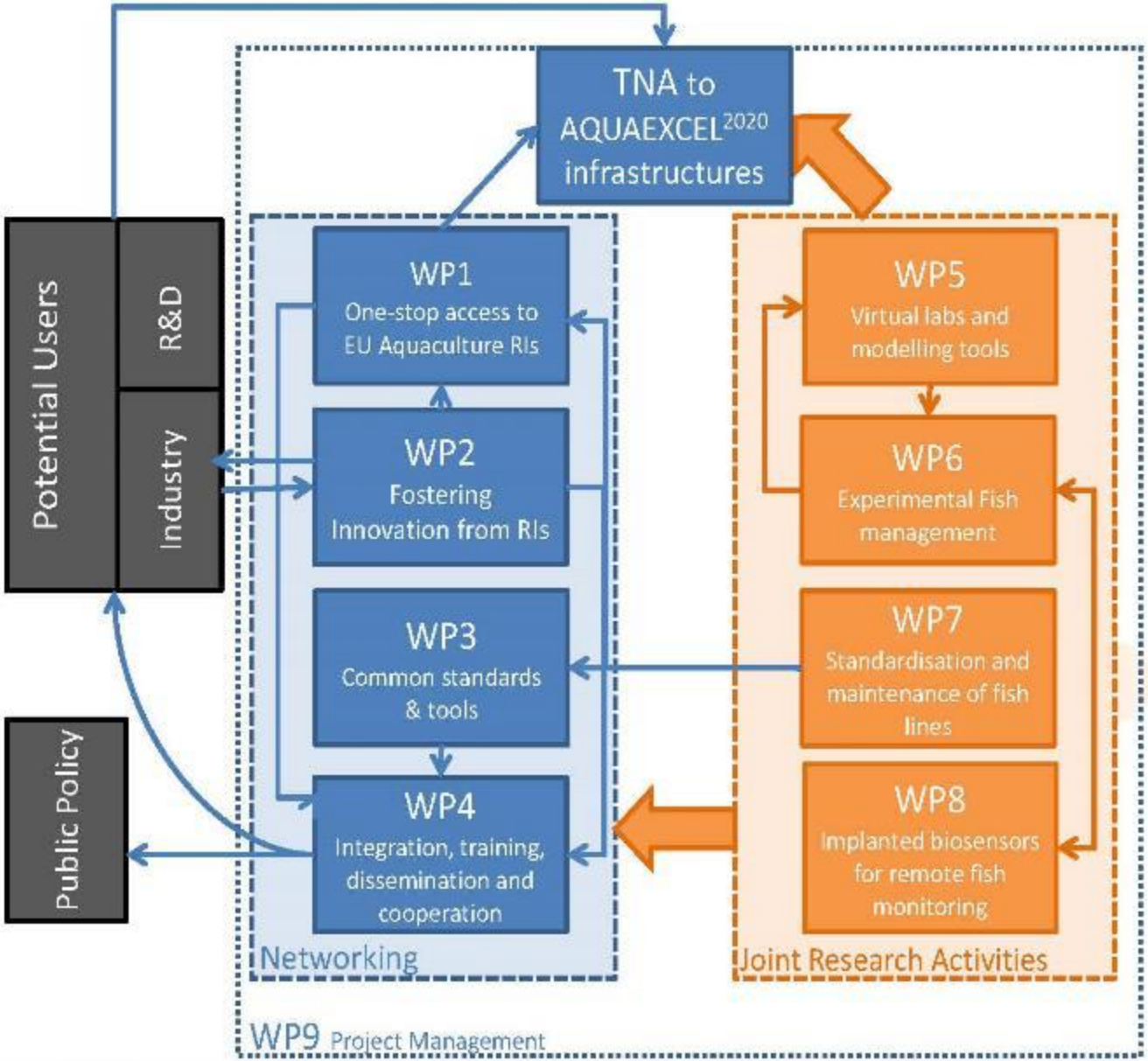

Project structure

Four workpackages focus on strengthening joint research activities, whilst four more involve TNA, industry links, developing common standards and tools and providing training and dissemination

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Networking activities

- Management of the TNA calls
- Fostering innovation through analysis and promotion of results by and Industry-Research Advisory Panel
- The Digital Fish: organize and share fish lines data
- An open access bioinformatics tool (Fish and Chips)
- Common procedures for cryobanking
- Data collection and interoperability
- “one stop shop” Web portal www.aquaexcel2020.eu
- Face-to-face and distance learning courses

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Joint research for better experiments

- Virtual modelling of aquaculture experimental facilities to help design/interpret experiments
- Experimental fish management: effect of life history on results, how to achieve maximal feed intake
- Development and maintenance of stable fish lines for experimental purposes
- Internal nano-sensors to monitor fish physiology/behavior in real time

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Transnational Access

The numbers

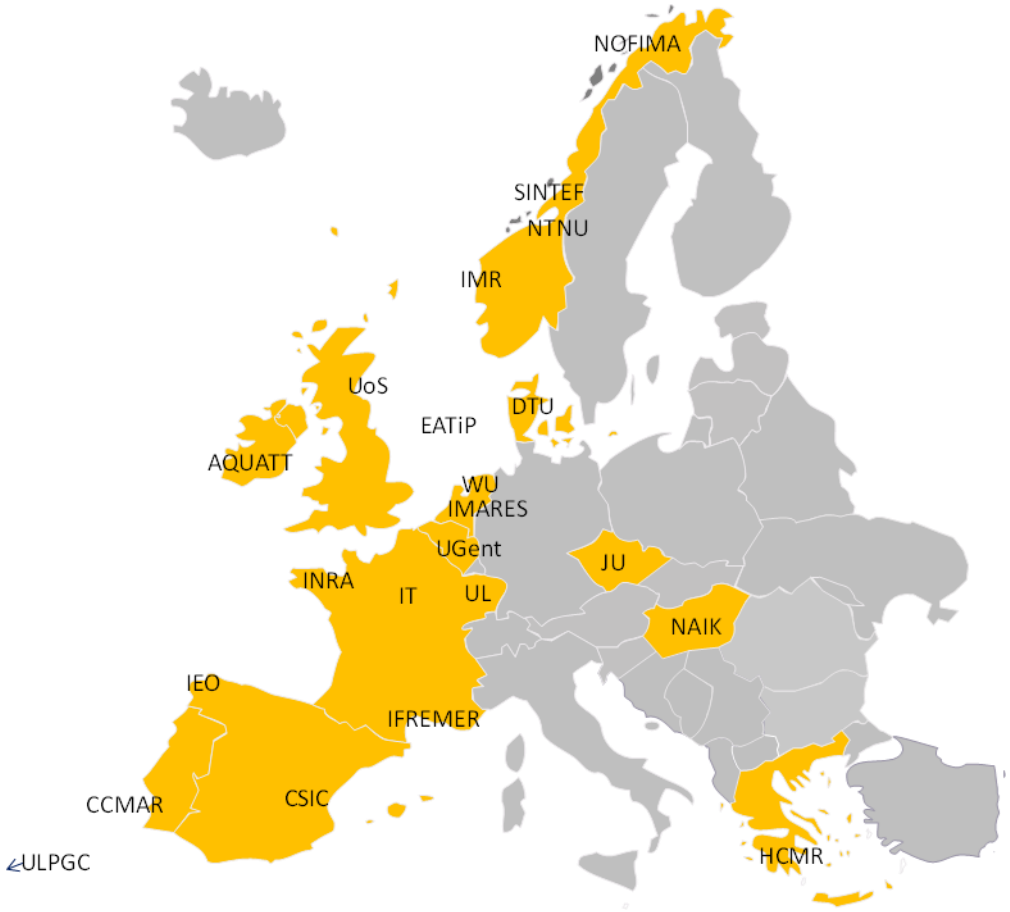
21 Host Organisations

39 Research Installations

~170 Funded Projects

~217 Users

~300 Applications



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The TNA offer

Access to the partner research installations for

- Researchers from public & private organisations
- Maximum 2 people for up to 3 months (remote access also possible)
- Use of facilities not available in own country
- Free (travel and subsistence expenses paid)

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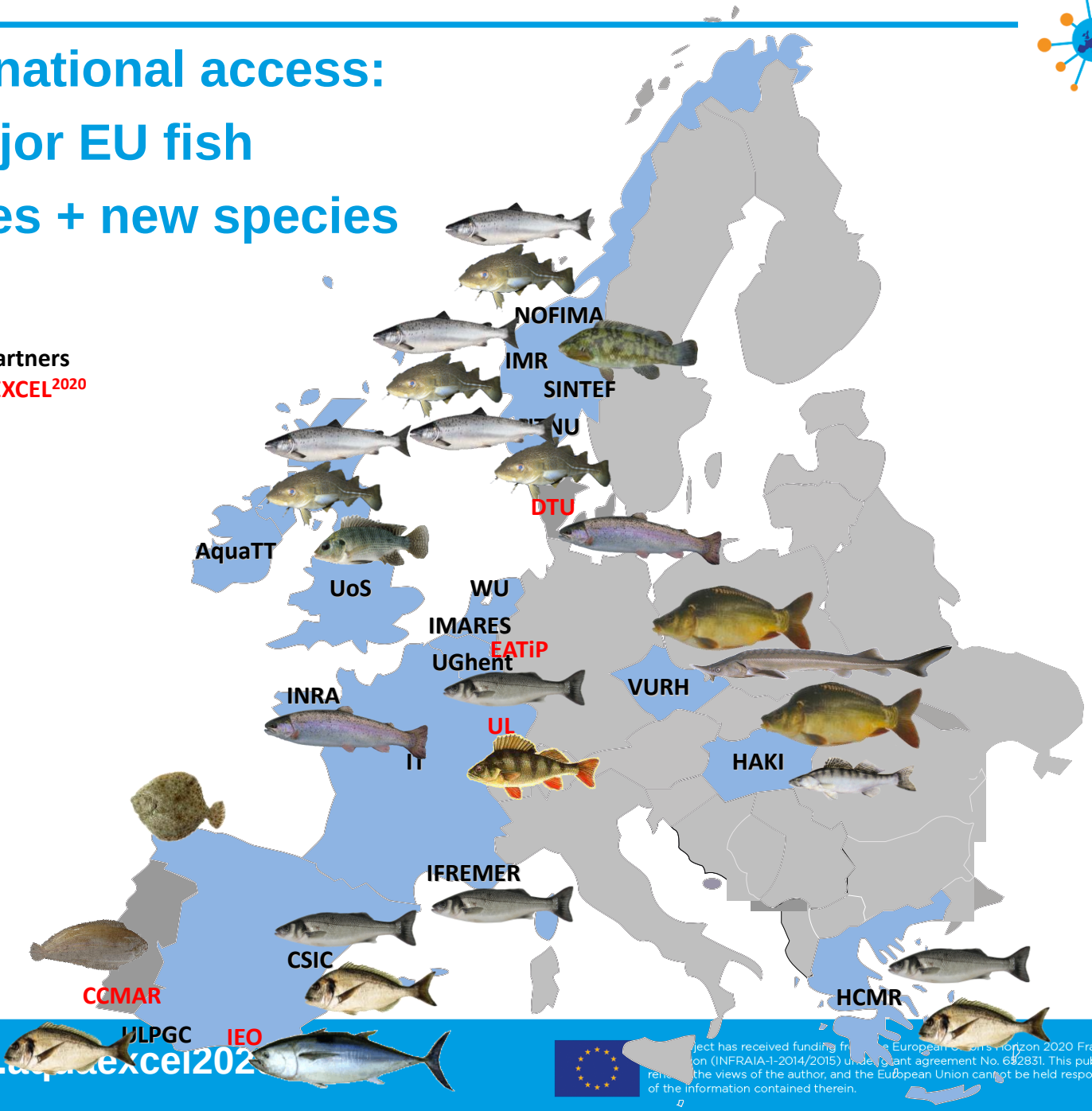
Transnational access: all major EU fish species + new species

AQUAEXCEL partners

New in AQUAEXCEL^{2020}



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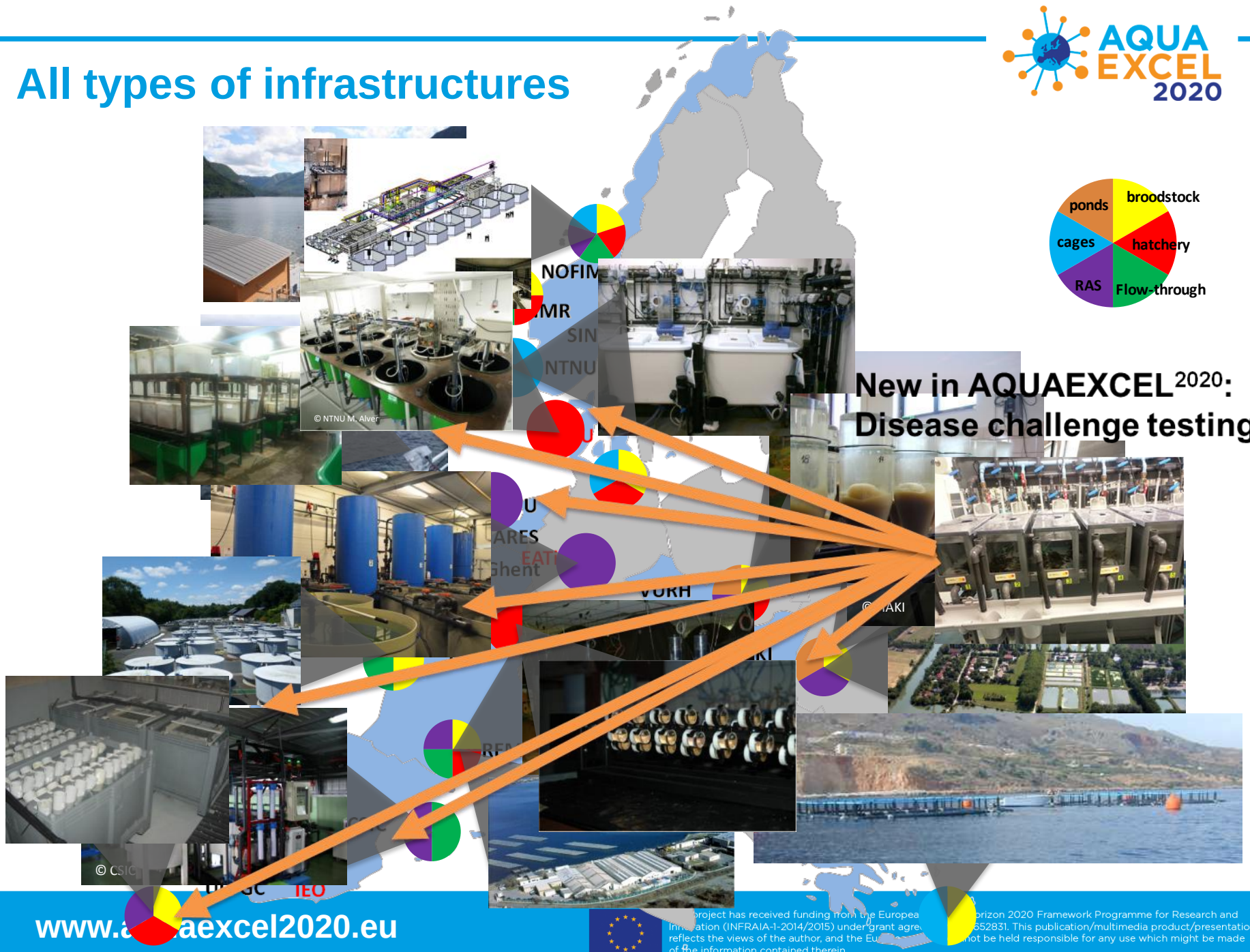
All types of infrastructures



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What is the vision for 2020 ?

In 2020, we will…

- have 180 TNA projects completed, many by SMEs and young scientists (trained in our AE^{2020} courses)
- be able to track the background info of all our results
- See AQUAEXCEL^{2020} results in all EU aquaculture conferences
- provide a documented catalogue of isogenic experimental lines of salmon, trout, sea bass and carp
- obtain better, industry meaningful results with less fish
- Follow experiments in real time with implanted fish and benchmark them with a priori simulation models

…prepare AQUAEXCEL^{2025} ?

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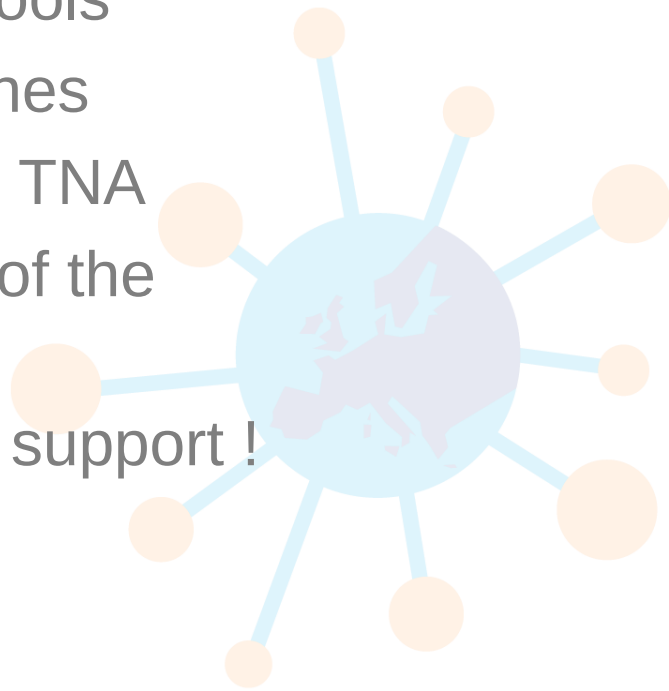
What are the benefits ?

For project partners

- Building a community of leading research organizations
- Sharing of experiences/ methods and tools
- Developing new experimental approaches
- Developing new collaborations through TNA
- But NOT subsidizing routine operation of the infrastructures
- Preparing an ERIC ? Need for national support !



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Challenges for an infra project

What do you need to build an infrastructures project ?

- Have a shared vision among top-level EU partners
- Identify complementarities / synergies among partners
- Have the right words in the Work Programme:
  - Easy for Networking Activities
  - Think well for Joint Research Activities:
    this is NOT problem-solving research
- The greatest challenge: an attractive TNA offer
  - What are your products and services ?
  - Would you use them if available in other institutions ?
  - Does not subsidize unused structures (20% rule) !!

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Thank You

AQUA EXCEL 2020

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