Component 3:
Regional Demonstrations

Activity 3.1

Component 3 Regional Demonstrations

$1650k

As case 4 is does not receive core GEF funds
A3.1 represents
5 x $270k for each demo region

Activity 3.1
Design common methodology & conduct regional demos to refine regional N_r assessments and improve understanding of regional N cycle.
Sutton/Raghuram

$1350k

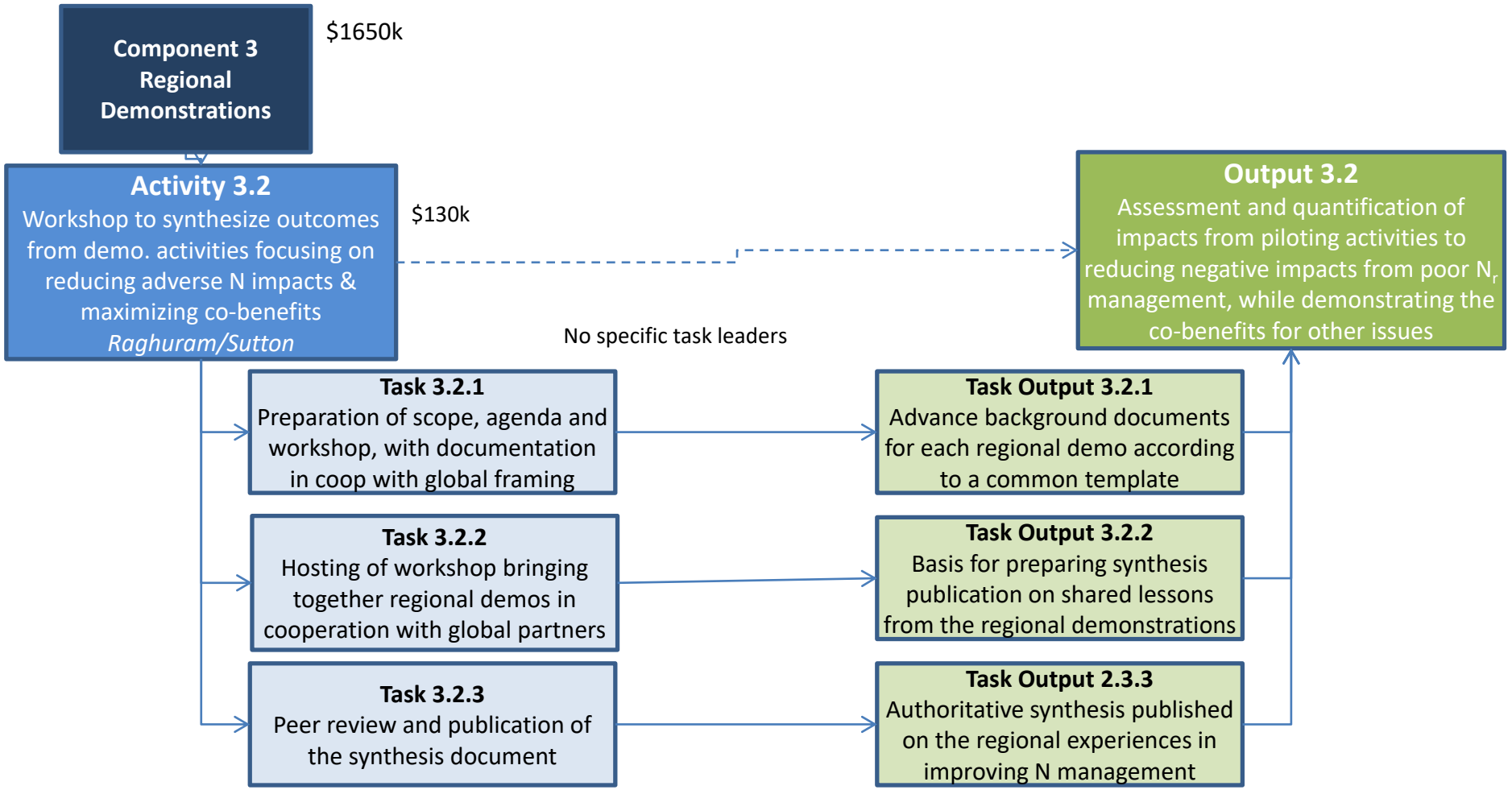
Output 3.1
Four demonstration cases deliver conclusions refining approaches to regional assessments and improving understanding of regional N cycle :
Case 1: Developing areas with excess N_r.
(*South Asia, East Asia, Latin America)*
Case 2: Developing areas with insufficient N_r.
(*East Africa)*
Case 3: Regions with transition economies.
(*East Europe)*
Case 4: Developed areas with excess N_r.
(West Europe) [by regional co-finance]

No specific task leaders, instead leads by region

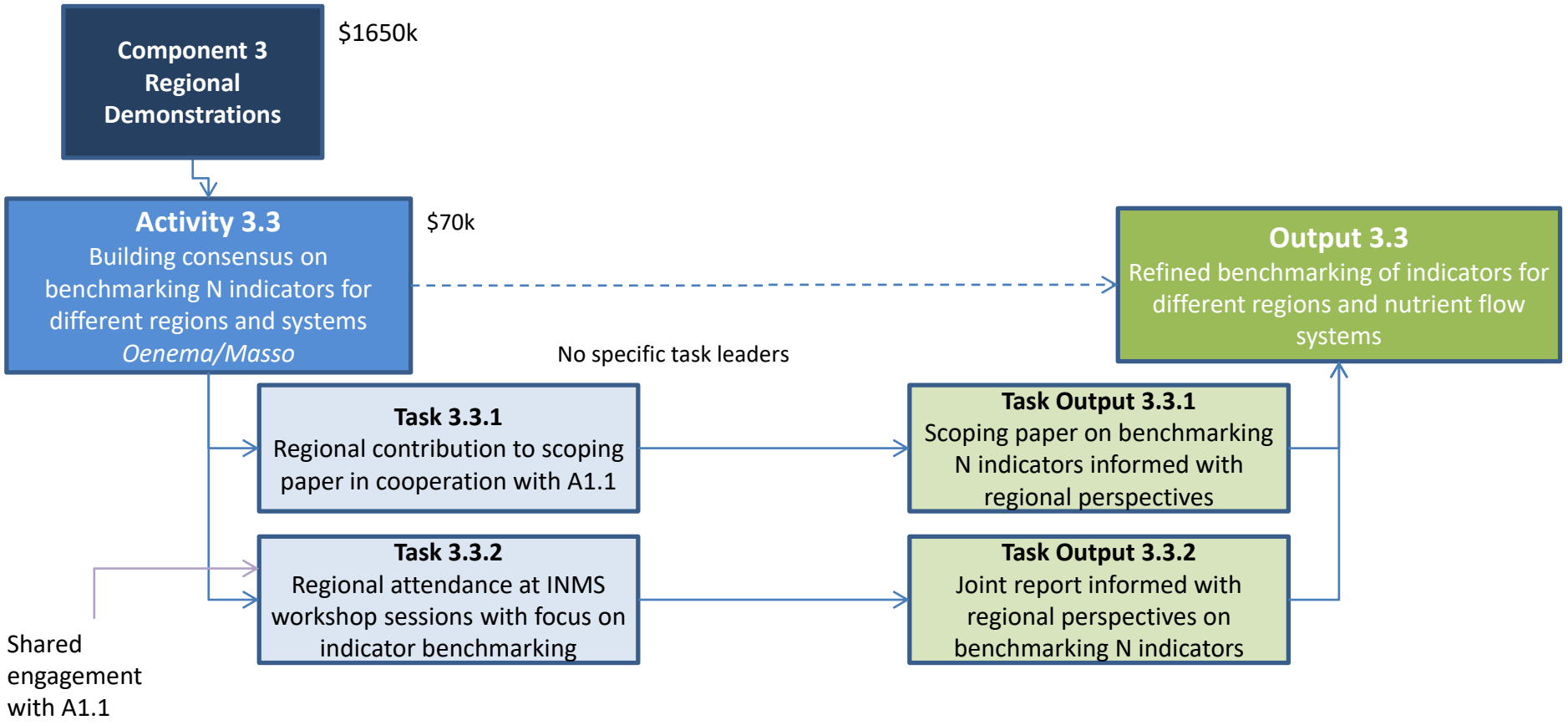
Support from C1, A2.1, A2.4 & C4

Tasks 3.1.1 & 3.1.2 Examination of N flows by source sector & loss pathway; inc improving access to data	**Task Outputs 3.1.1 & 3.1.2** Main N flows quantified by source sector & pathway; better data access & understanding
Task 3.1.3 Identifying & quantifying major uncertainties and means to improve	**Task Output 3.1.3** Quantification of major N source sectors with estimated uncertainties
Tasks 3.1.4 & 3.1.5 Identifying & agreeing key threat/benefit priorities with policy stakeholders, supported by CBA	**Task Outputs 3.1.4 & 3.1.5** Key N benefits/threats quantified & regional priorities identified with policymakers & others
Task 3.1.6 Description in relation to N performance indicators, in co-operation with global analysis	**Task Output 3.1.6** Basis to compare regions in relation to agreed performance indicators
Task 3.1.7 Review of available options for mitigation/better N management, co-benefits/trade-offs	**Task Output 3.1.7** Document on N mitign/mangnt options identifying win-wins & regional priority list of options
Task 3.1.8 Profiling success stories, barriers to change, and demonstration of N joined up approach	**Task Output 3.1.8** Synthesis of current efforts with examples of how a 'full N approach' can help overcome barriers
Task 3.1.9 Contribution to scenario development in cooperation with global analysis	**Task Output 3.1.9** Global N scenarios informed by evidence from the regional demonstrations

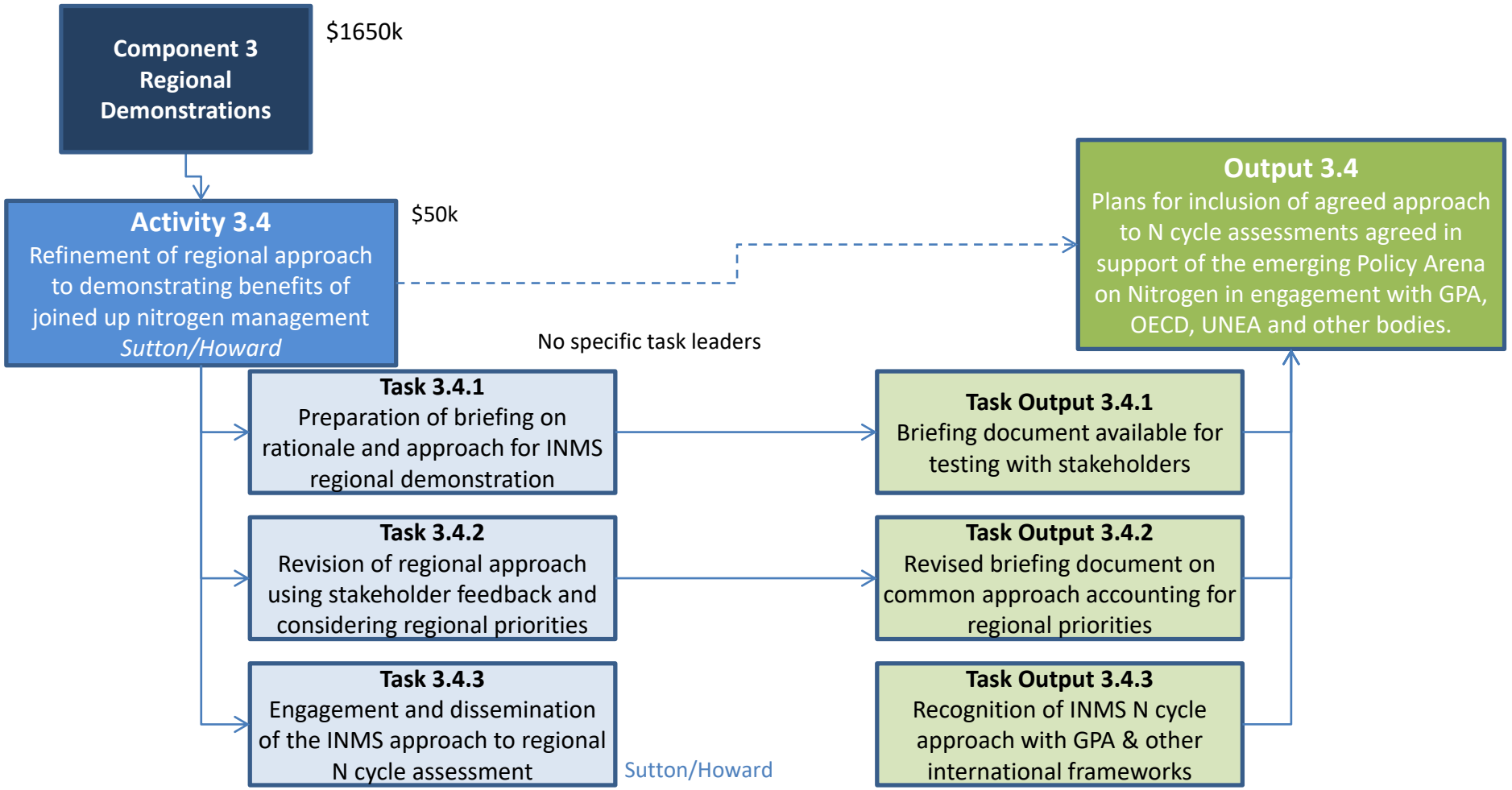
Activity 3.2


Component 3 Regional Demonstrations
$1650k
Activity 3.2
Workshop to synthesize outcomes from demo. activities focusing on reducing adverse N impacts & maximizing co-benefits
Raghuram/Sutton
$130k
Output 3.2
Assessment and quantification of impacts from piloting activities to reducing negative impacts from poor N_r management, while demonstrating the co-benefits for other issues
No specific task leaders
Task 3.2.1
Preparation of scope, agenda and workshop, with documentation in coop with global framing
Task Output 3.2.1
Advance background documents for each regional demo according to a common template
Task 3.2.2
Hosting of workshop bringing together regional demos in cooperation with global partners
Task Output 3.2.2
Basis for preparing synthesis publication on shared lessons from the regional demonstrations
Task 3.2.3
Peer review and publication of the synthesis document
Task Output 2.3.3
Authoritative synthesis published on the regional experiences in improving N management

Activity 3.3


Component 3 Regional Demonstrations
$1650k
Activity 3.3
Building consensus on benchmarking N indicators for different regions and systems
Oenema/Masso
$70k
Output 3.3
Refined benchmarking of indicators for different regions and nutrient flow systems
No specific task leaders
Task 3.3.1
Regional contribution to scoping paper in cooperation with A1.1
Task Output 3.3.1
Scoping paper on benchmarking N indicators informed with regional perspectives
Task 3.3.2
Regional attendance at INMS workshop sessions with focus on indicator benchmarking
Task Output 3.3.2
Joint report informed with regional perspectives on benchmarking N indicators
Shared engagement with A1.1

Activity 3.4


Component 3 Regional Demonstrations
$1650k
Activity 3.4
Refinement of regional approach to demonstrating benefits of joined up nitrogen management
Sutton/Howard
$50k
Output 3.4
Plans for inclusion of agreed approach to N cycle assessments agreed in support of the emerging Policy Arena on Nitrogen in engagement with GPA, OECD, UNEA and other bodies.
No specific task leaders
Task 3.4.1
Preparation of briefing on rationale and approach for INMS regional demonstration
Task Output 3.4.1
Briefing document available for testing with stakeholders
Task 3.4.2
Revision of regional approach using stakeholder feedback and considering regional priorities
Task Output 3.4.2
Revised briefing document on common approach accounting for regional priorities
Task 3.4.3
Engagement and dissemination of the INMS approach to regional N cycle assessment
Sutton/Howard
Task Output 3.4.3
Recognition of INMS N cycle approach with GPA & other international frameworks

Template for demo sites

The West EU Case study

- **Geographical region : NW Atlantic Façade, exploring a gradient from Mediterranean to temperate regime**

  - Participants from Spain, Portugal, France, ….
  - N in excess from intensive agricultural practices
    - ➔*Coastal eutrophication*
    - ➔ *Aquifers contamination*
    - ➔*Atmospheric pollution*

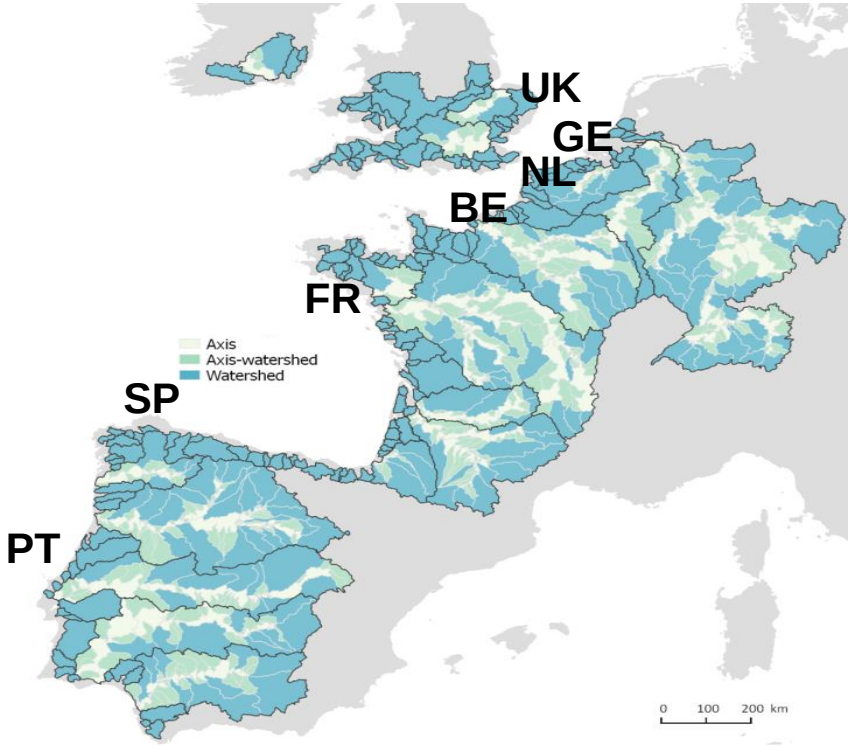
  - Uncertainties linked to reservoirs/water intake, P status and erosion, …

The West EU Case study : embedded territories

The European Atlantic coast from Gibraltar to the Rhine

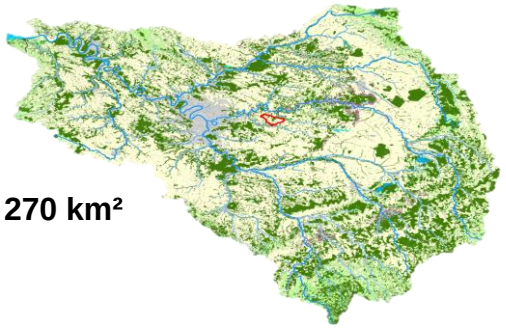
→ **Large individual river basins** → **Small equipped watersheds**

Downscaling ***Downscaling***



Mediterranean to temperate climate gradient

France : Seine R.



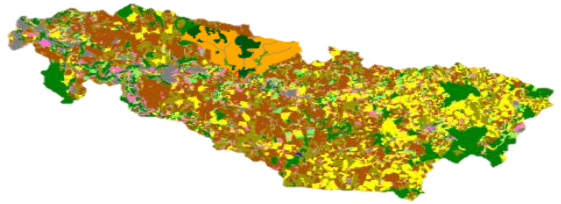
76 270 km²

Portugal & Spain : Tagus R.

81 447 km²

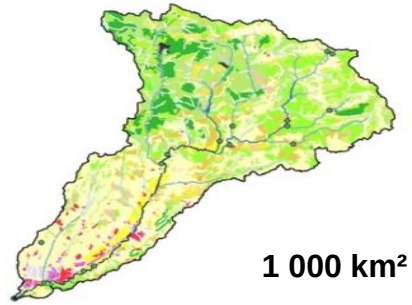
intensive measurements of processes in the N cascade
(crop managmt, N losses,…)

Gd Morin>Orgeval R.



1 000 km²> 100 km²

Henares R.



1 000 km²

Upscaling

The West EU Case study

Processes involved in the N cascade of the N-EU Atlantic façade, with a focus on embedded sub-basins of the Seine & Tagus R.

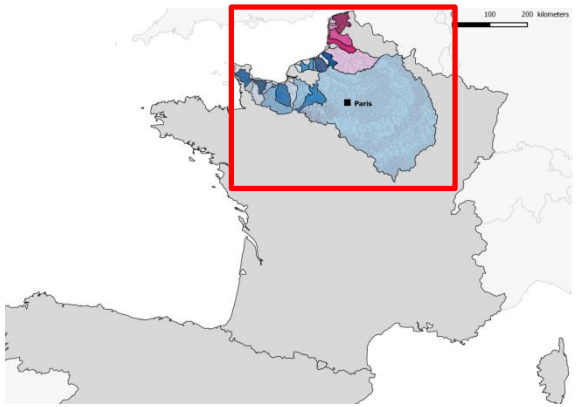
Objectives

- **Describe and model the current N flows through agricultural, atmospheric and hydrological systems of a regional territory along its land-sea continuum, and their major controlling factors**

- **Establish and assess various future management scenarios for reducing coastal eutrophication/hypoxia (nutrients excess and disequilibrium), and pollution of soils, waters, and air in the human environnement associated to reactive N (NH_3, NO_x, N_2O and NO_3^-), Si and P.**

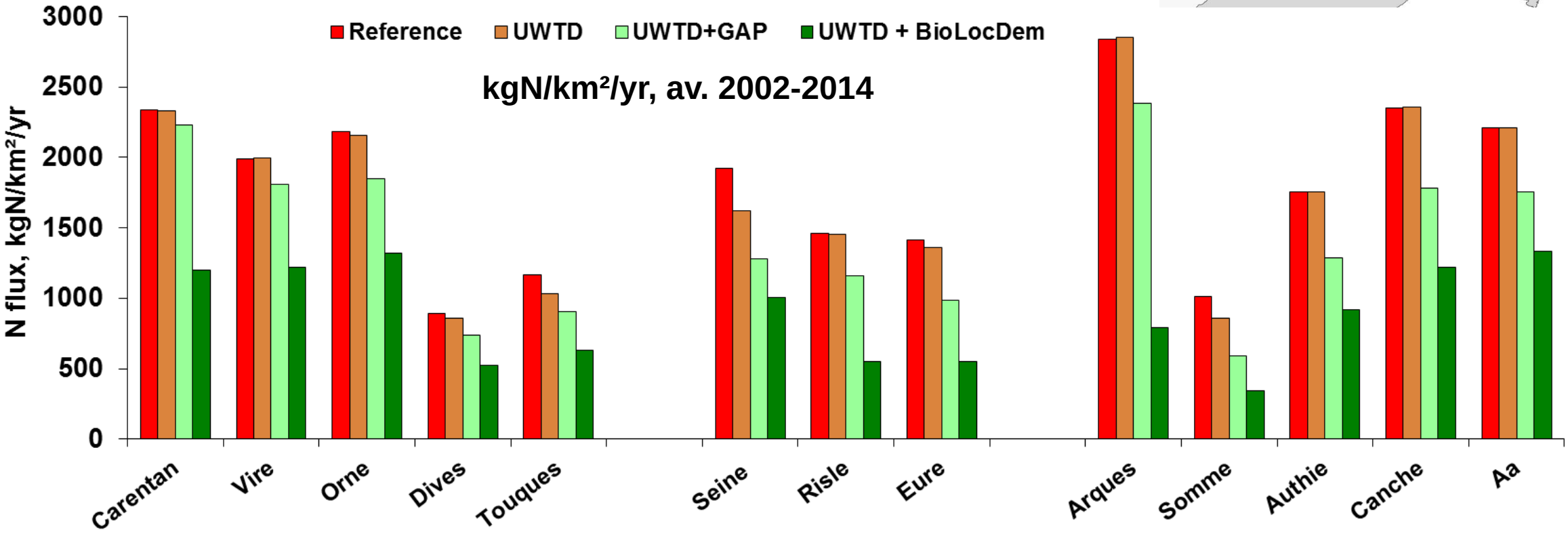
- **Elaborate prospective (not prescriptive) scenarios, on the basis of emerging "weak signals" (organic food, circular economy, reconnection of crop/livestock, sobriety in way of life, …)**

The West EU Case study

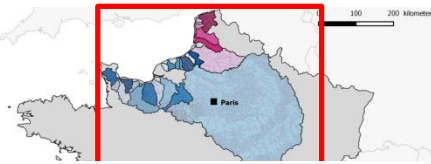


- **Background in the North of France**

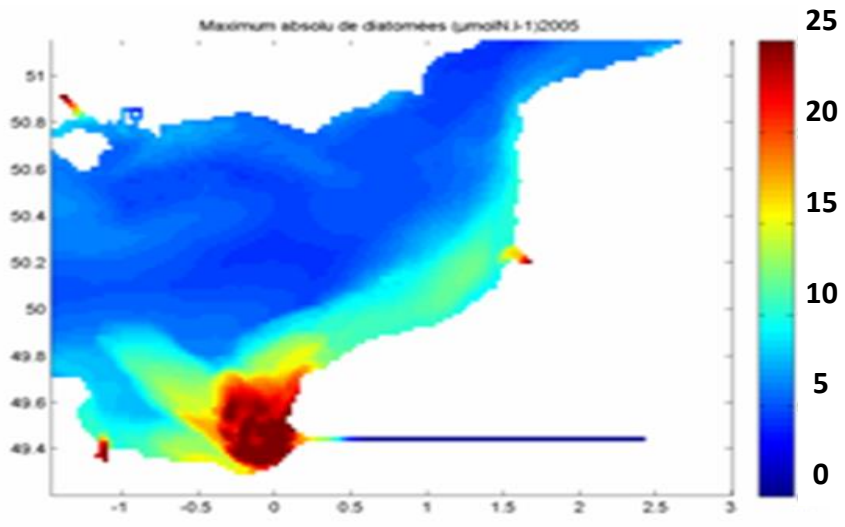
  ➔ **N fluxes to the coast for a reference situation and scenarios**

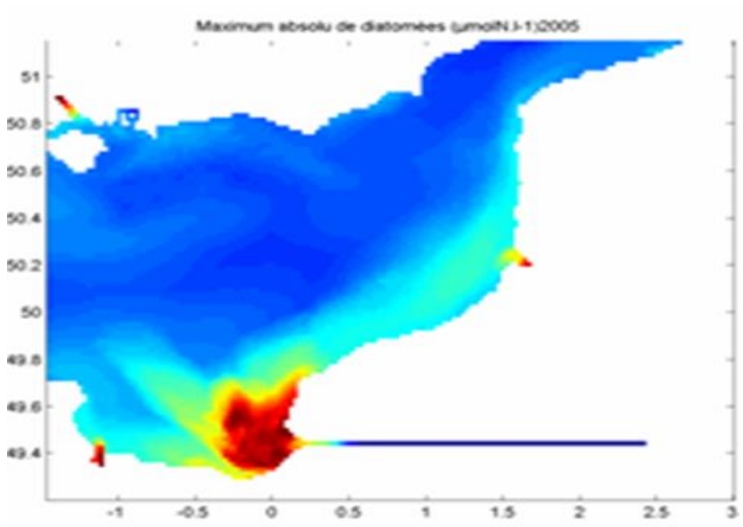


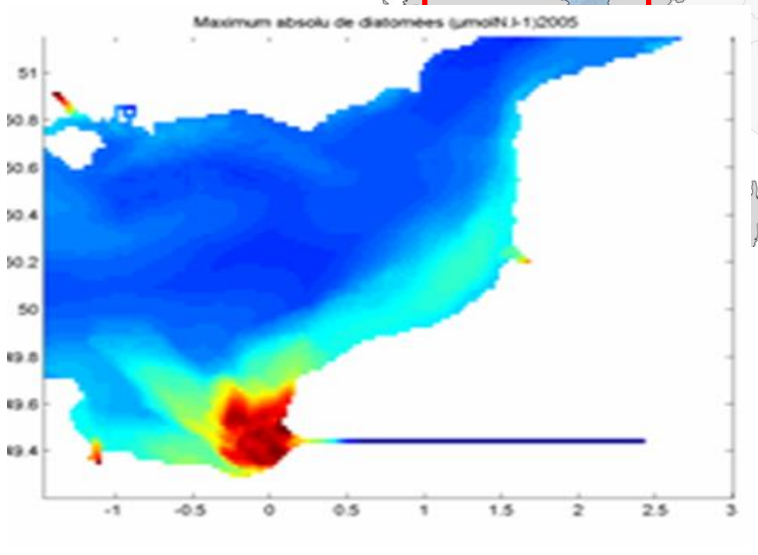
Background in the North of France: impact at the coastal zone



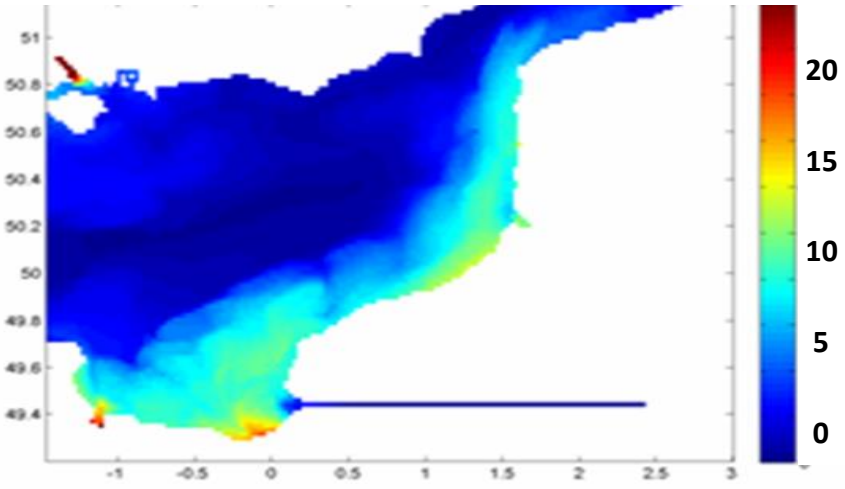
max diatom biomass, µmolN/l

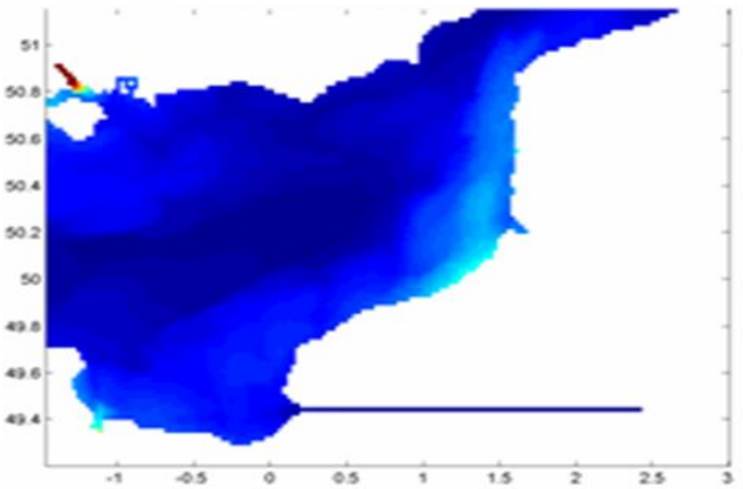


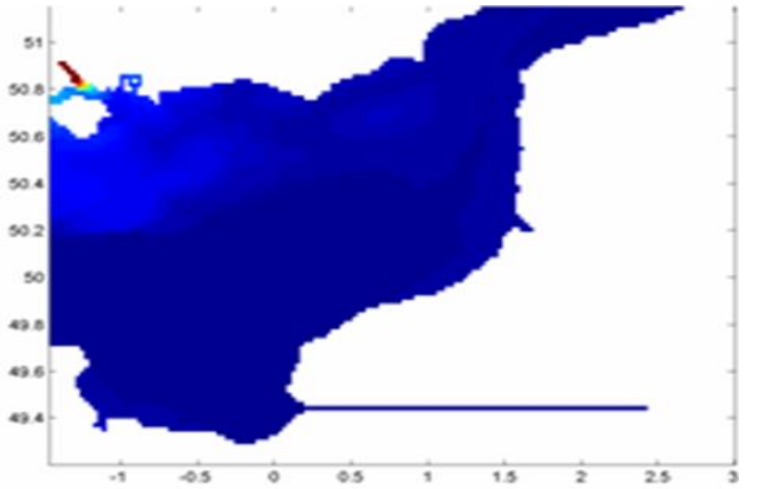




max HAB biomass, µmolN/l







Reference

UWTD +
Good Agr. Pract.

UWTD +
Org-local-demitarian

Passy et al., 2016

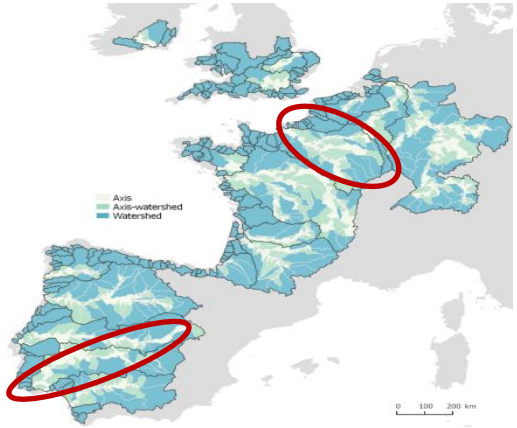
Adressed Issues : Examples of the Tagus vs. The Seine R.

Critical

Potentially critical

Not critical

Evidencing paradox !



N management issues		Tagus	Seine
Water issues	**Low water periods**		
	Reservoirs		
	Point source pollution		
	N retention		
Agricultural issues	**Crop mineral fertilisation**		
	Livestock and Crop manure fertilization		
	Irrigation		
Atmospheric emissions & pollution	**Ammonia**		
	Nitrous oxide		
	Ozone		
Coastal Potential Eutrophication	**N:P:Si nutrient deliveries vs. upwelling**		

The West EU Case study

Tentative workplan for M7-M18 (April 2018-March 2019)

Data collection

- Data on reservoirs, many in Mediterranean countries, and their genetic implementation in the Grafs-Riverstrahler approach
- Implementation of the Grafs approach (N, P) surface balance at a NUTS 3 regional resolution (e.g., sub-regions in Portugal, provinces in Spain, department in France, …)

Modelling

- Atmospheric flows (NH_3 volatilisation, N_2O emissions, ozone)
- The hydrosystem (leaching, river nutrient flows, coastal eutrophication …
- Exploring scenarios

The West EU Case study

- **Key stakeholders**

  Water Agencies, farmers associations, regional/national/EU authorities,…

- **Other related initiatives**
  - **ILTER**
  - **Networks of farmers (equipment of farms)**
  - **Global Research Alliance for GHG mitigation in agriculture, GRA**

- **Related projects in the pipeline**

  - on going National Projects

  - submission to SUDOE, H2020, other ideas ?

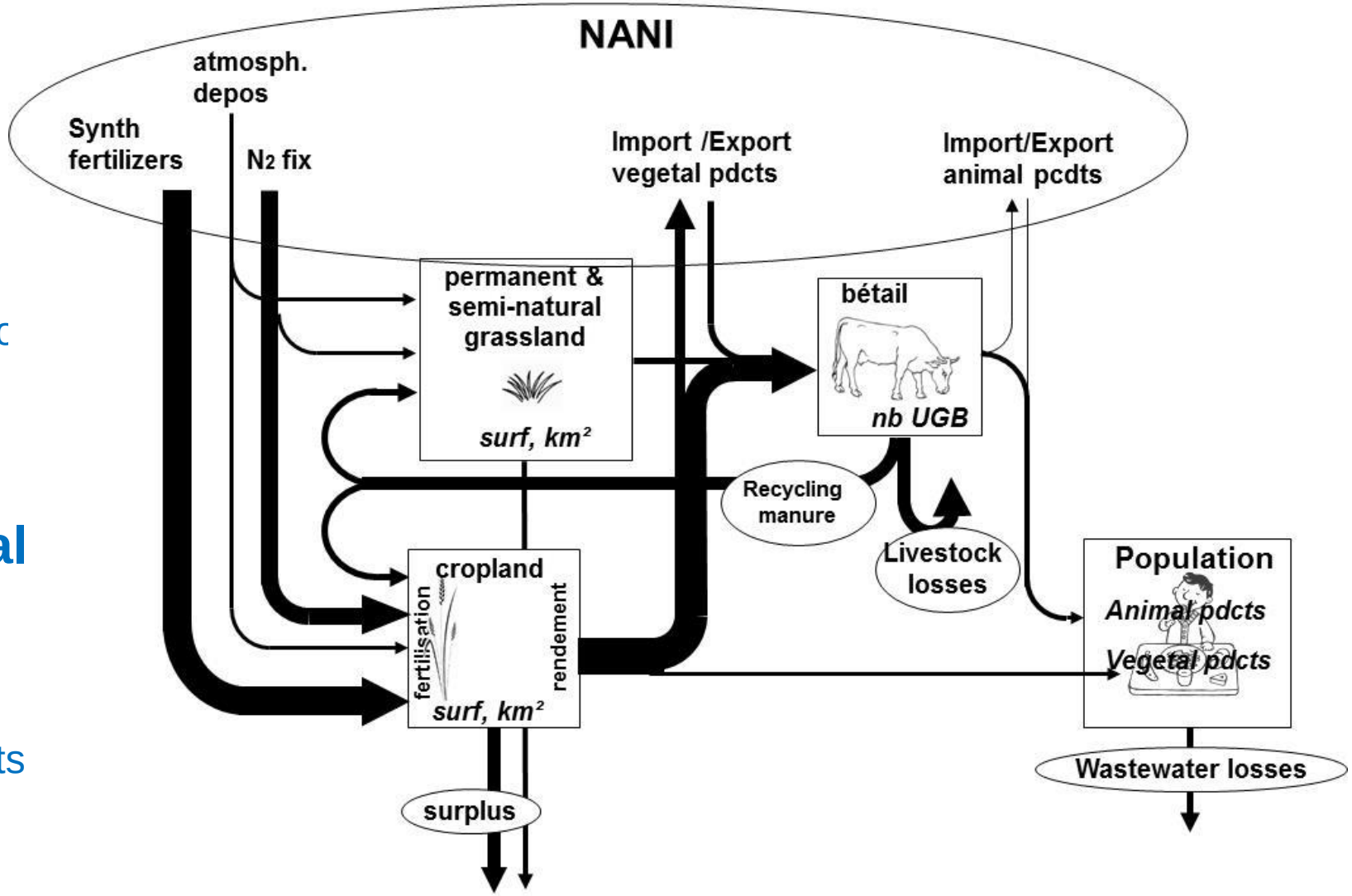
The West EU Case study: potential support to other demo regions

❑ A generic GRAFS approach :

- to be coupled with water quality models
- Assessment of scenarios in terms c water quality

❑ Expertise in experimental approaches

- water quality
- Agricultural rotations analysis
- atmospheric pollution measurements



- Provides a coherent picture N mass balance
- Relationships within the water-agro-food system of a territory
- Indicators evaluatio (surplus, NANI,…)

The West EU Case study

- **Expected support from other demo regions**

  - Confronting story lines of scenarios
    - Good agricultural practices
    - Deep agricultural changes

  - Comparison of results (model, experiments) in a range of conditions in the world

The West EU Case study

- Concluding remarks

➔ Need for finding financial support

  - Elaboration of projects (regional, national and EU)
  - Appointement of PhDs and post-docs with modelling skills

General discussion on demo sites

- How to establish common methodology across regions with contrasting needs and priorities?
- Demo sites SWOT analysis to inform the collaboration