ALTOS Monitoring Board - Meeting #1: project overview

- Societal challenges, overall and specific objectives
- Methodological challenges
- Experimental and methodological strategies, available assets
- Results dissemination and exploitation
- Activity structuration (WPs overview)
- Deliverables & Milestones (to be revisited due to credit diminution)
- Governance structure

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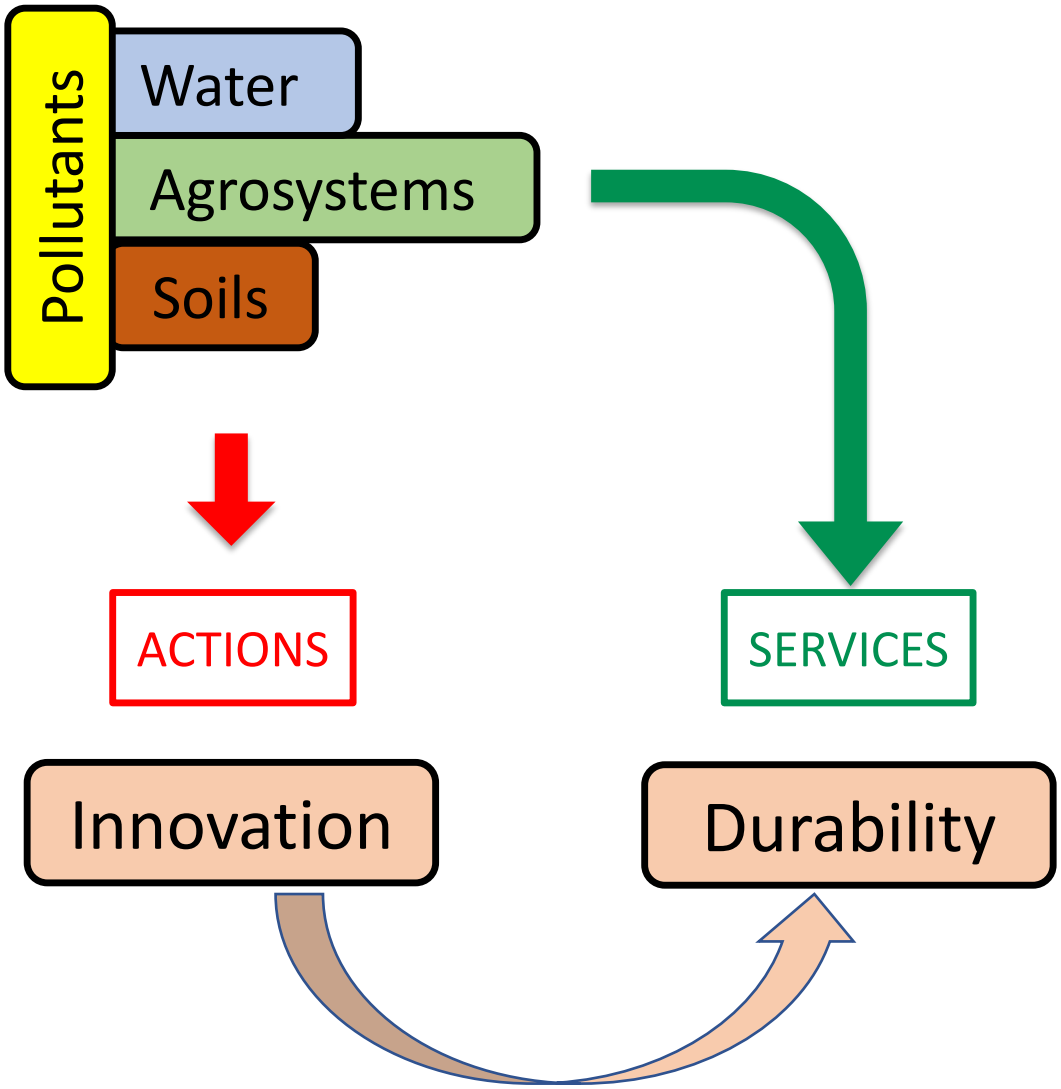
ALTOS: innovative actions & durability



ALTOS: innovative actions

Pollutants

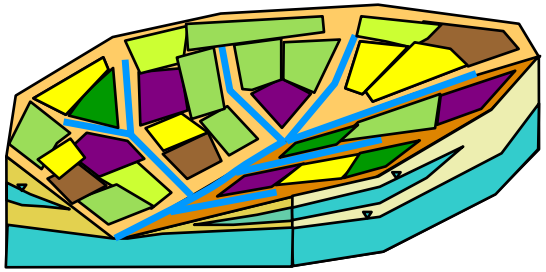
- Water
- Agrosystems
- Soils

ACTIONS

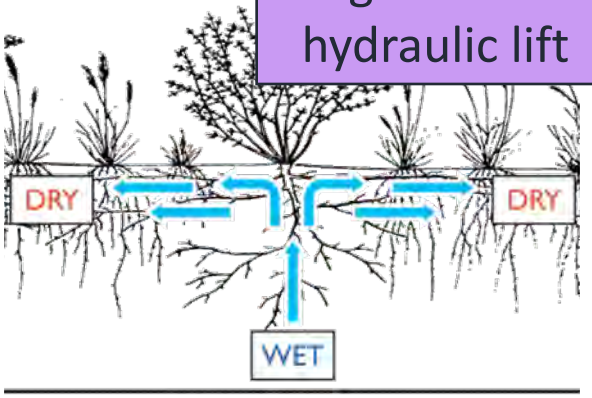
Innovation

Gaining from spatial structures and connectivities

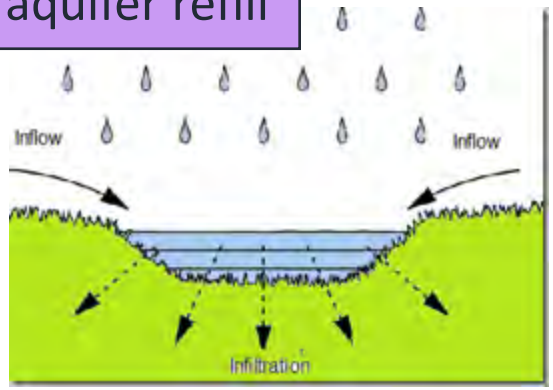
Land use & downstream refill



Vegetation & hydraulic lift

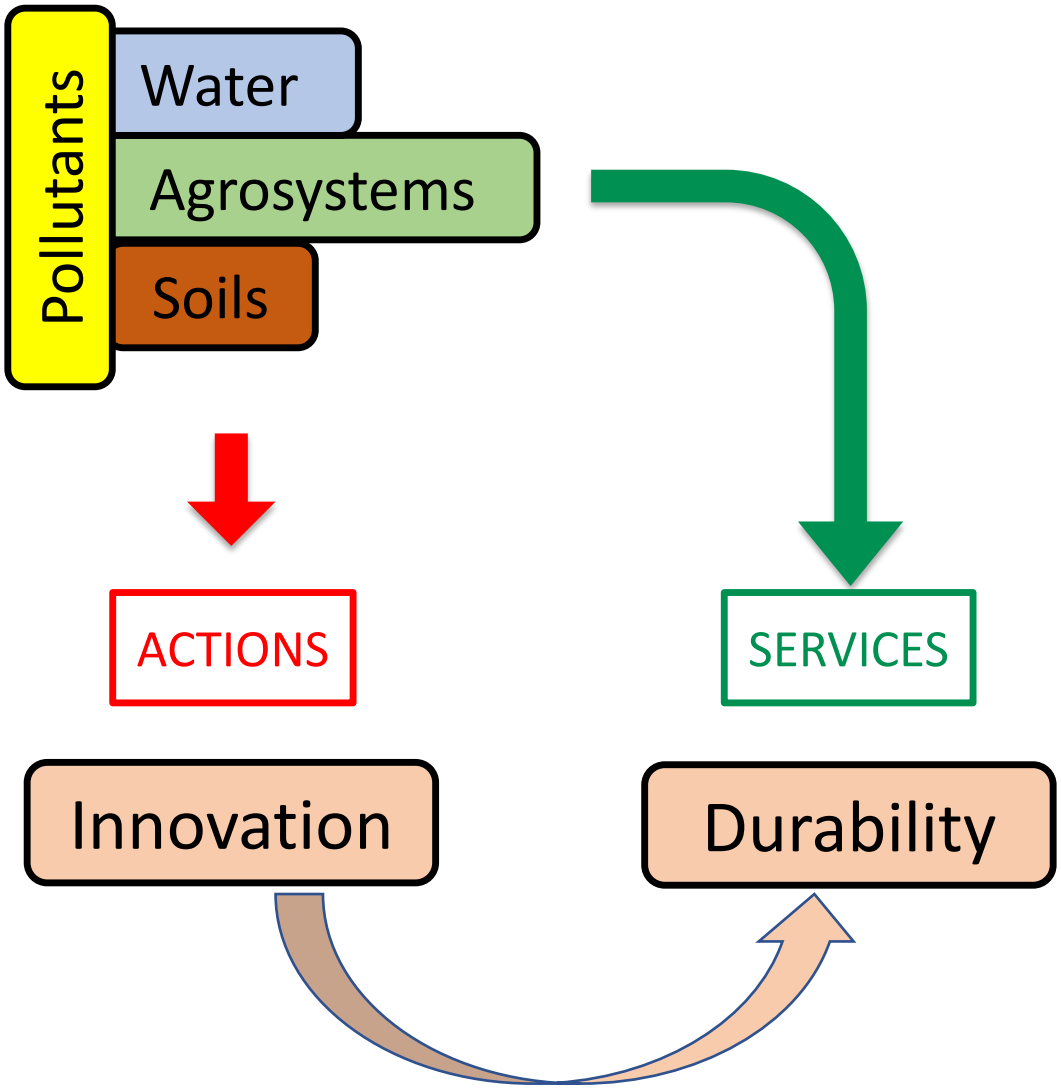


Reservoirs & aquifer refill



Vegetation & water consumption

ALTOS: durability

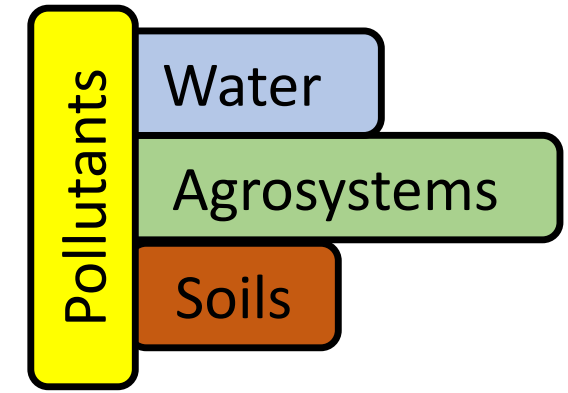


Harvesting potable & irrigation water

Enhancing crop production

Minimising contaminations

ALTOS: spatial structures & connectivities



ACTIONS

Innovation

Gaining from spatial structures and connectivities

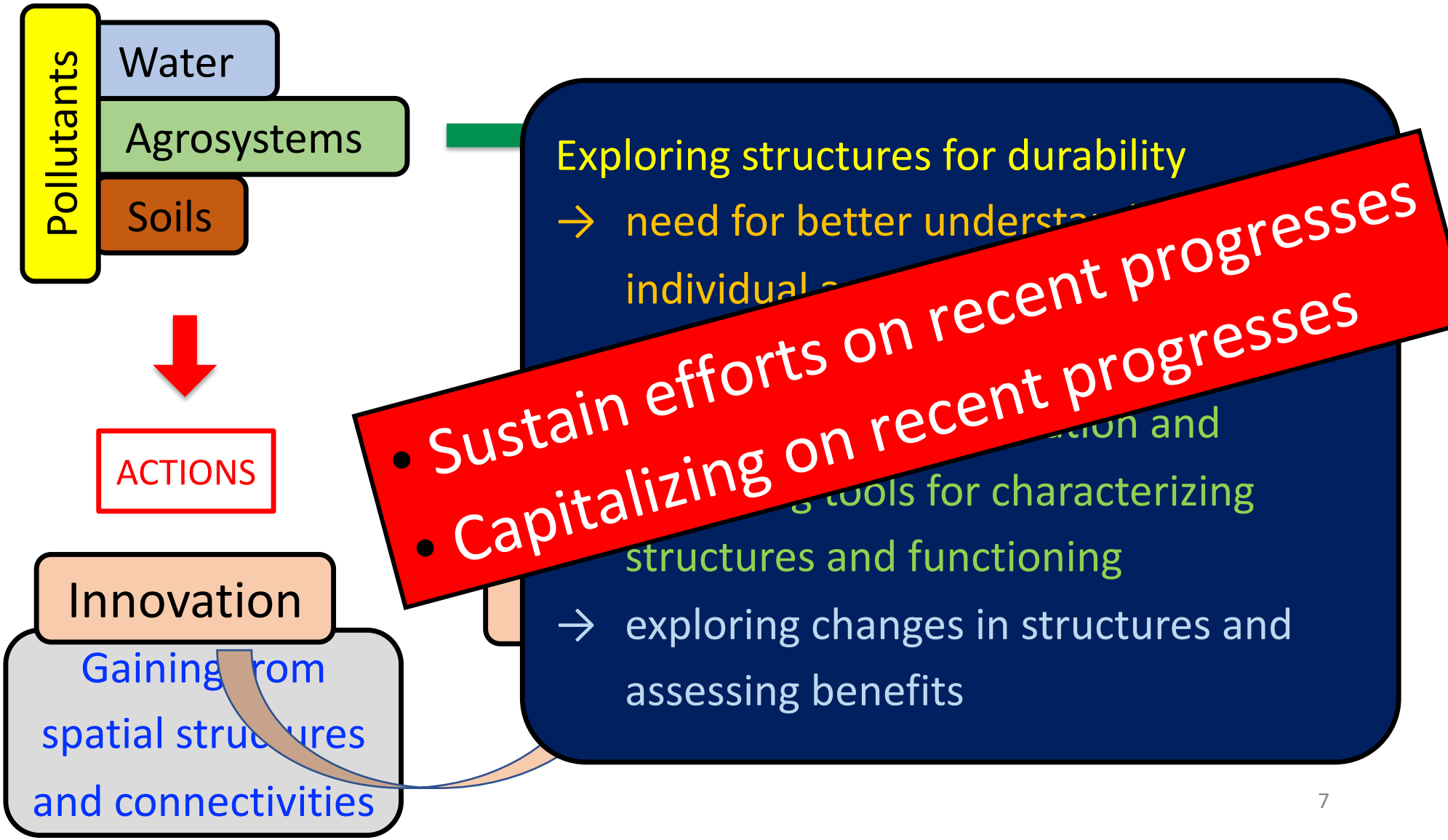
Exploring structures for durability

→ need for better understanding individual and collective behaviours within patchworks

→ proposing new observation and modelling tools for characterizing structures and functioning

→ exploring changes in structures and assessing benefits

ALTOS: spatial structures & connectivities



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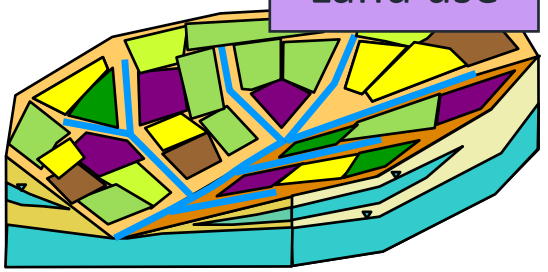
ALTOS: structures and scales

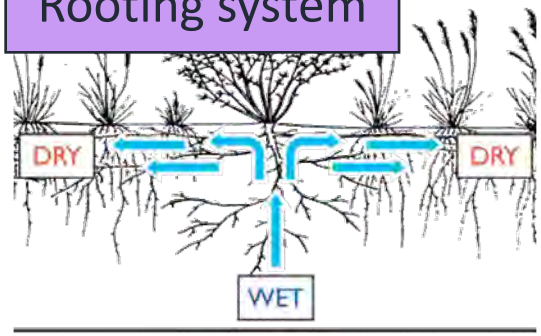
Canopy

Bench networks

Land use

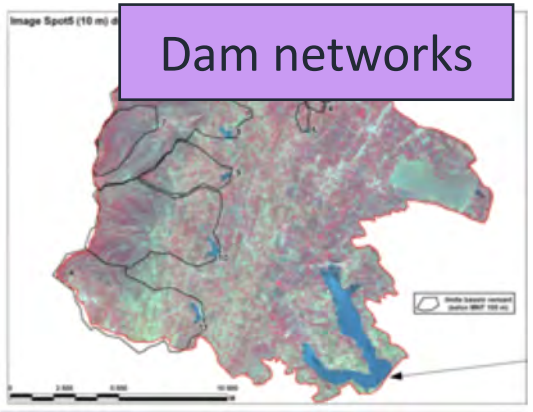


Rooting system



Hilly lake

Dam networks

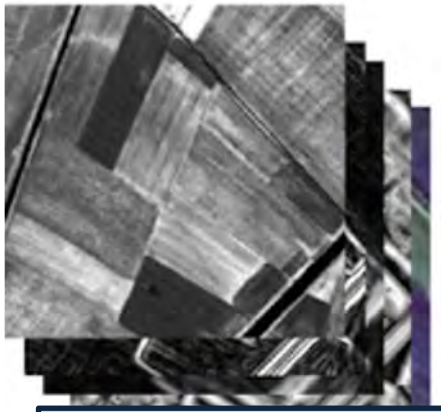


SPATIAL SCALE

ALTOS: methodological challenges in monitoring

Photogrammetry

Digital representation

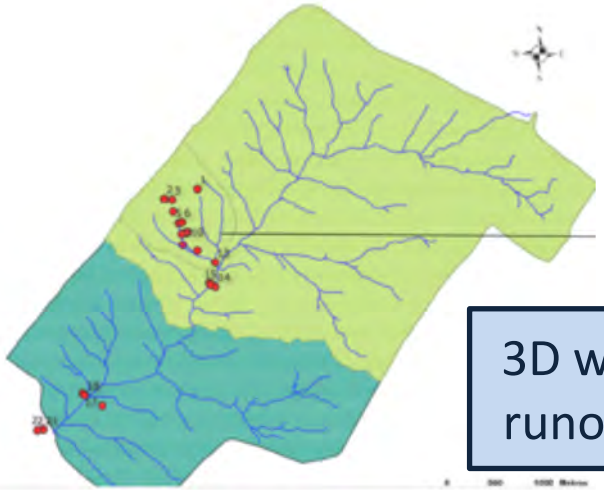


Multi-temporal high resolution imagery

ALTOS: methodological challenges in monitoring

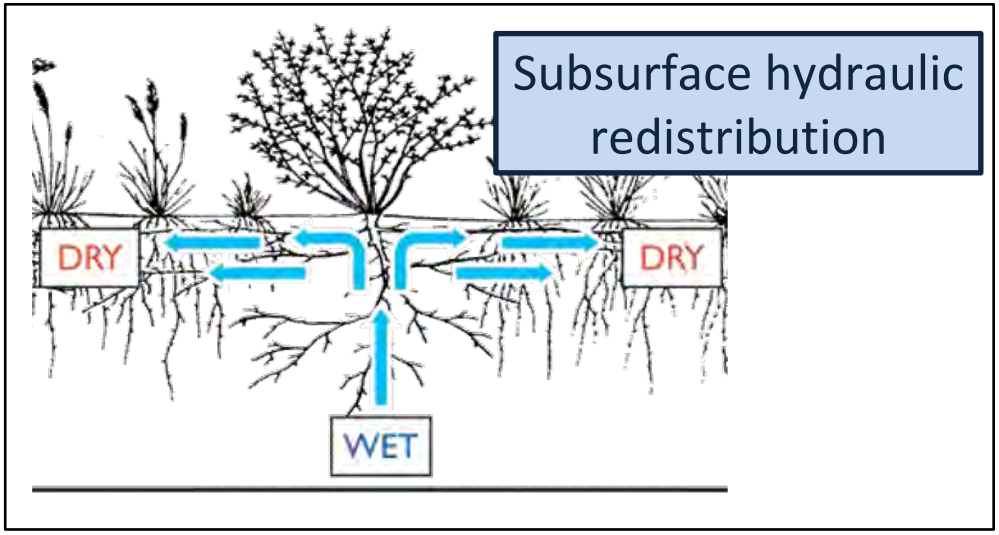
3D water fluxes for vegetation

Nested hydrological measurements

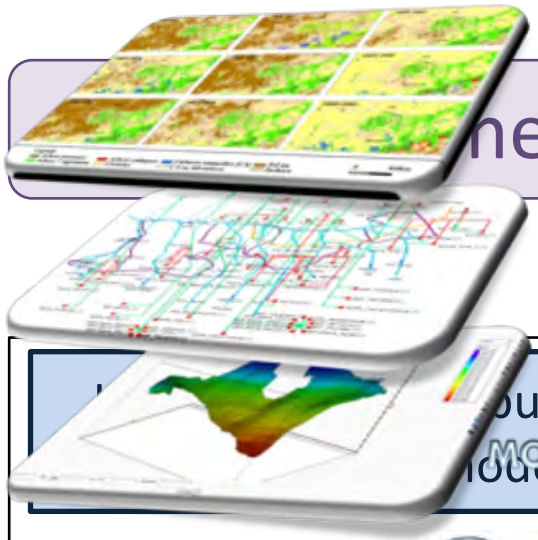


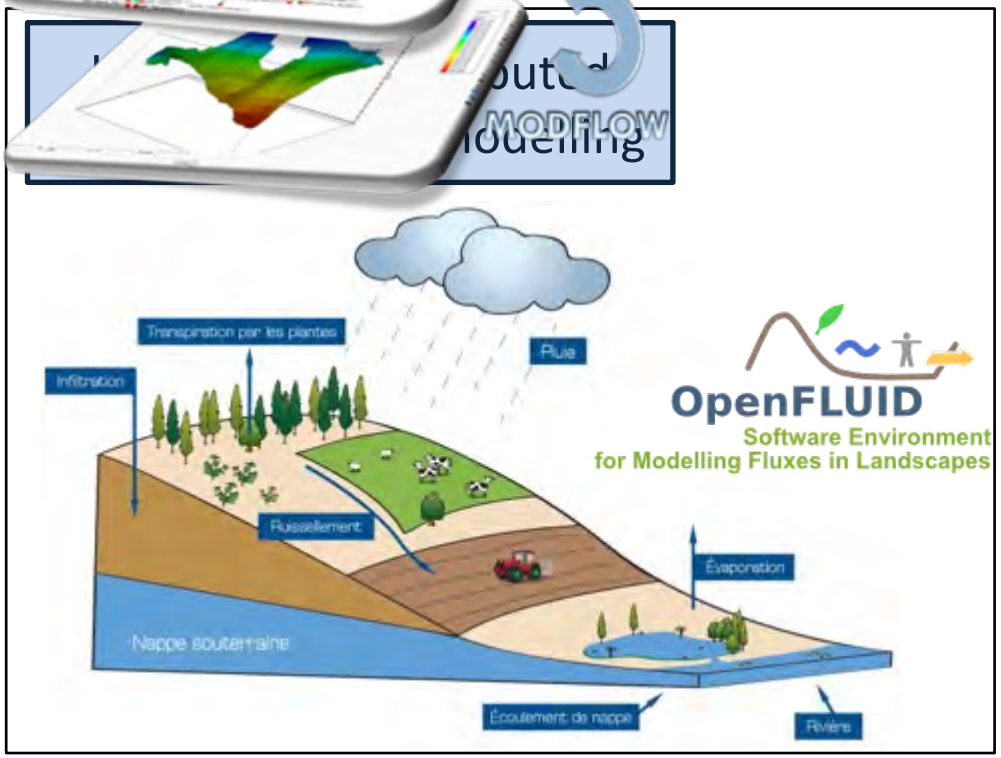
3D water fluxes for runoff / infiltration

ALTOS: methodological challenges in modelling

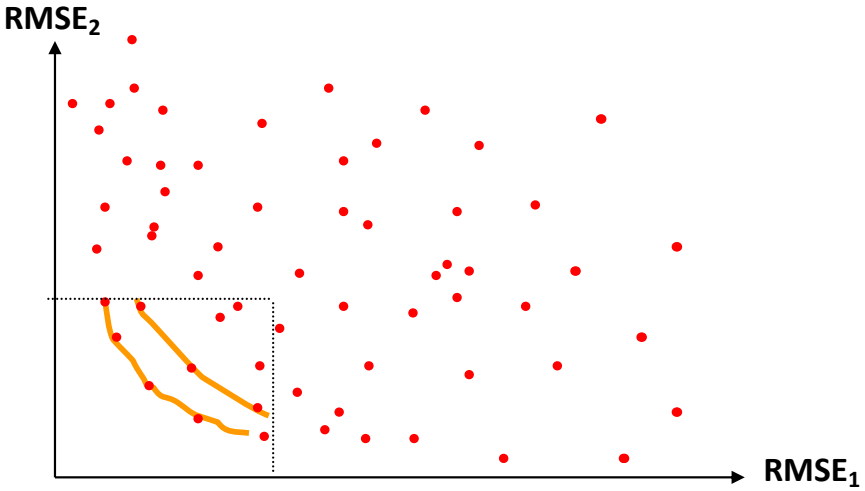


methodological challenges in modelling

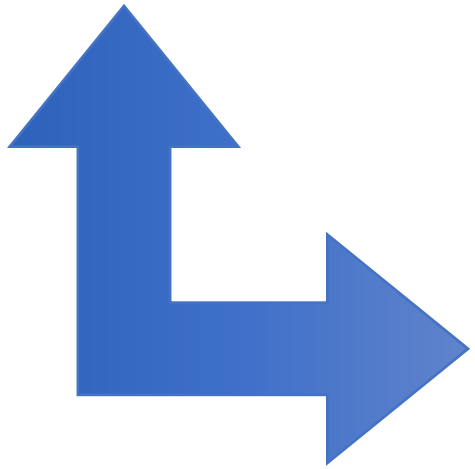


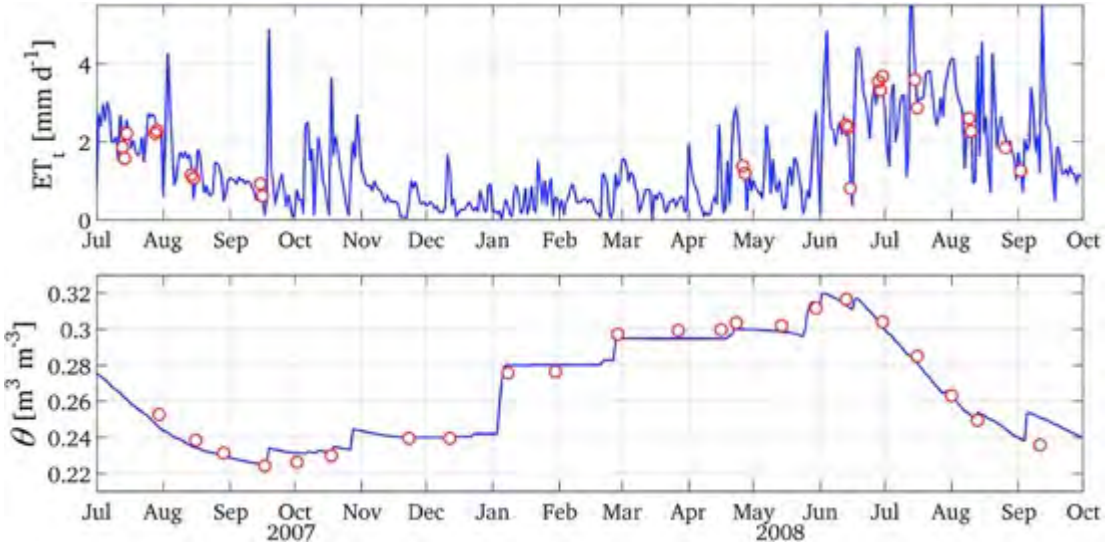


ALTOS: methodological challenges in modelling



Multicriteria and multi-objective calibration

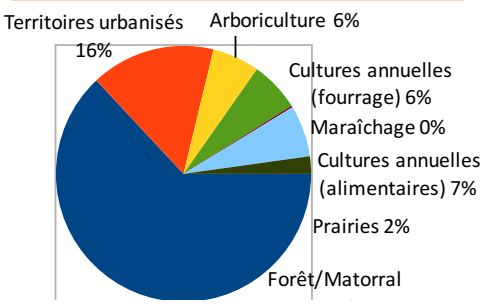




ALTOS: methodological challenges in scenarios

Régional trends
[qualitative / narrative]

Sub-regional trends
[qualitative estimates]



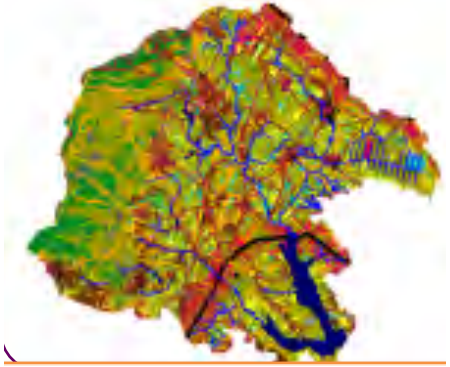
+

Spatial distribution

Constraints fields
(topography, soils)

=

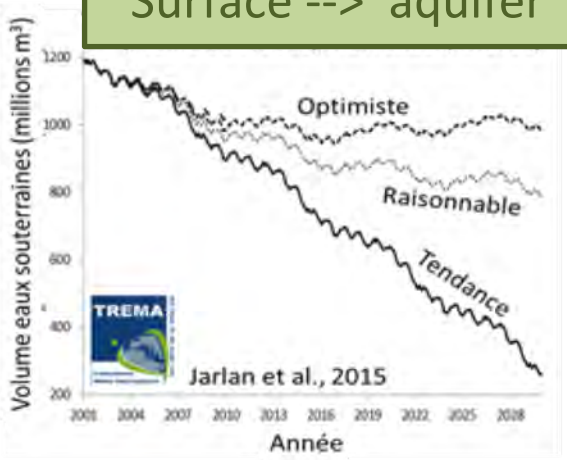
Local trends
[field scale]



Debating via
participative protocols

ALTOS: methodological challenges in assessment

Surface --> aquifer



Upstream --> downstream

Impact assessment

Participative protocols

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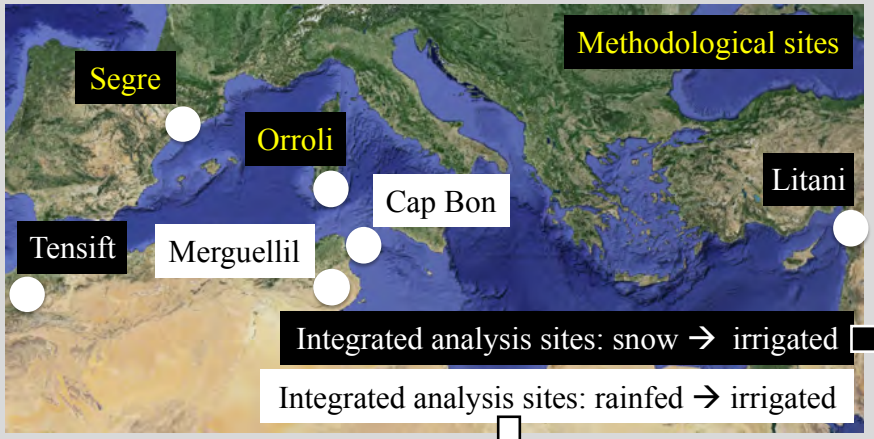
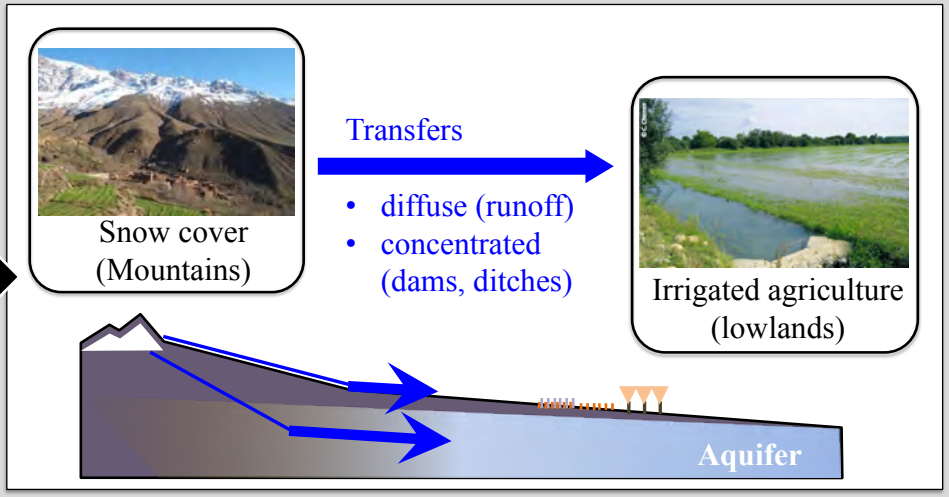
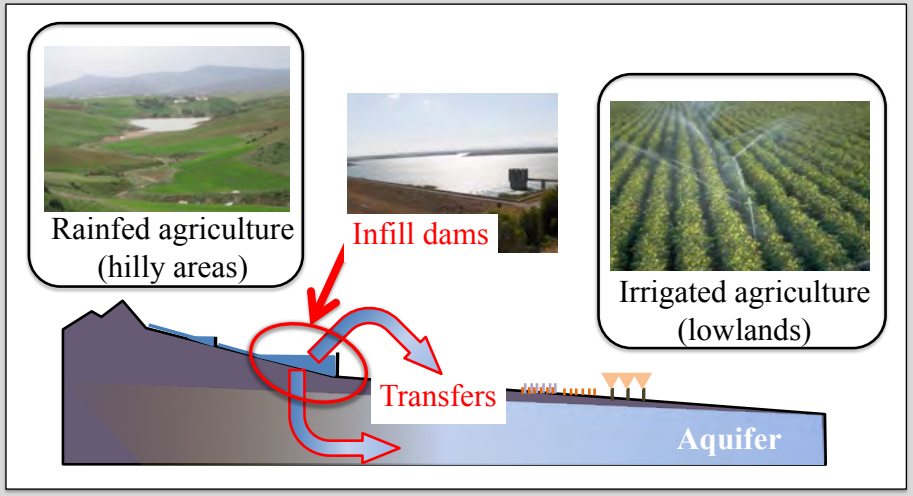
ALTOS: study sites





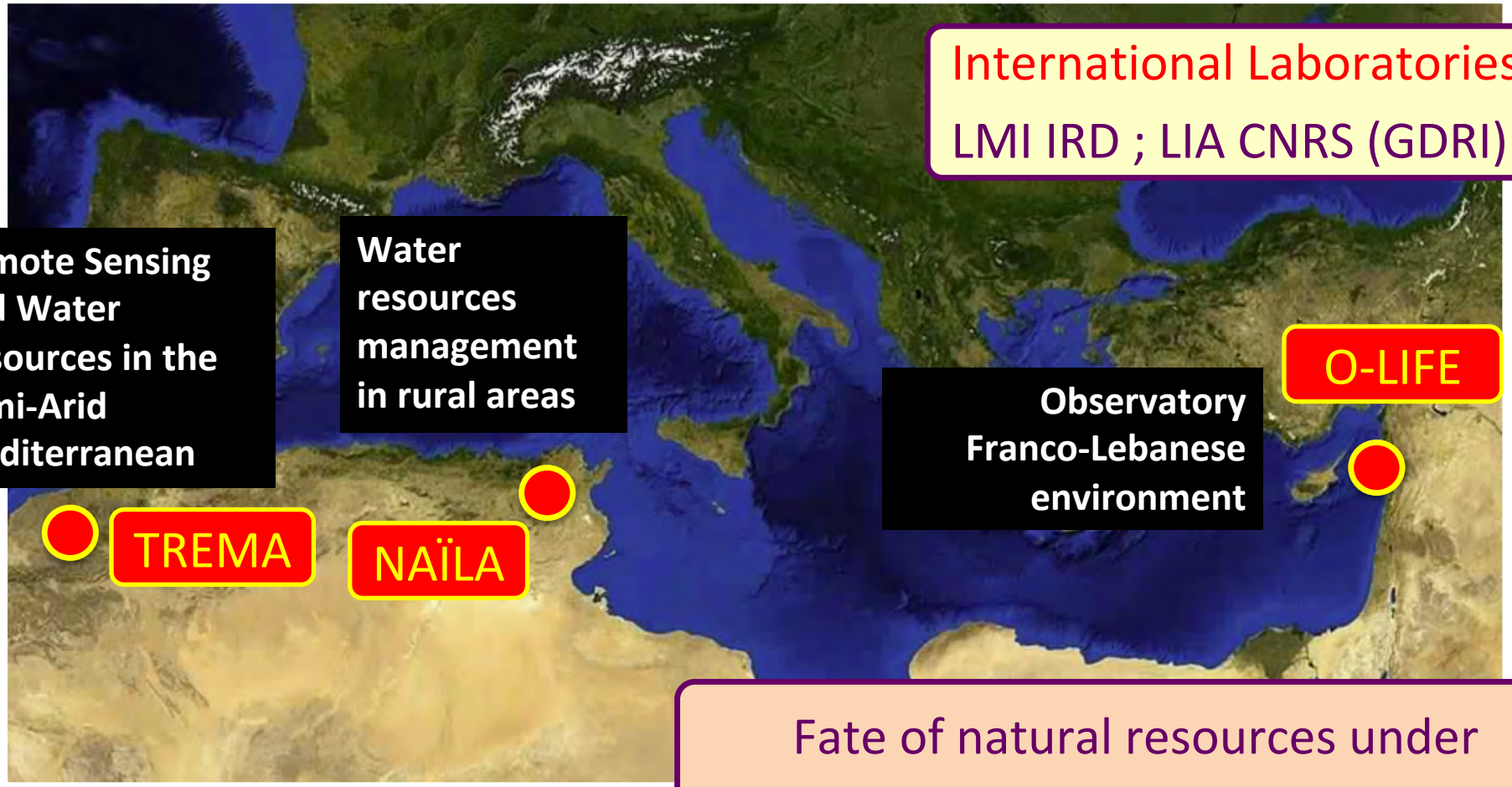


Hydrological upstream - downstream Ecosystem gradients

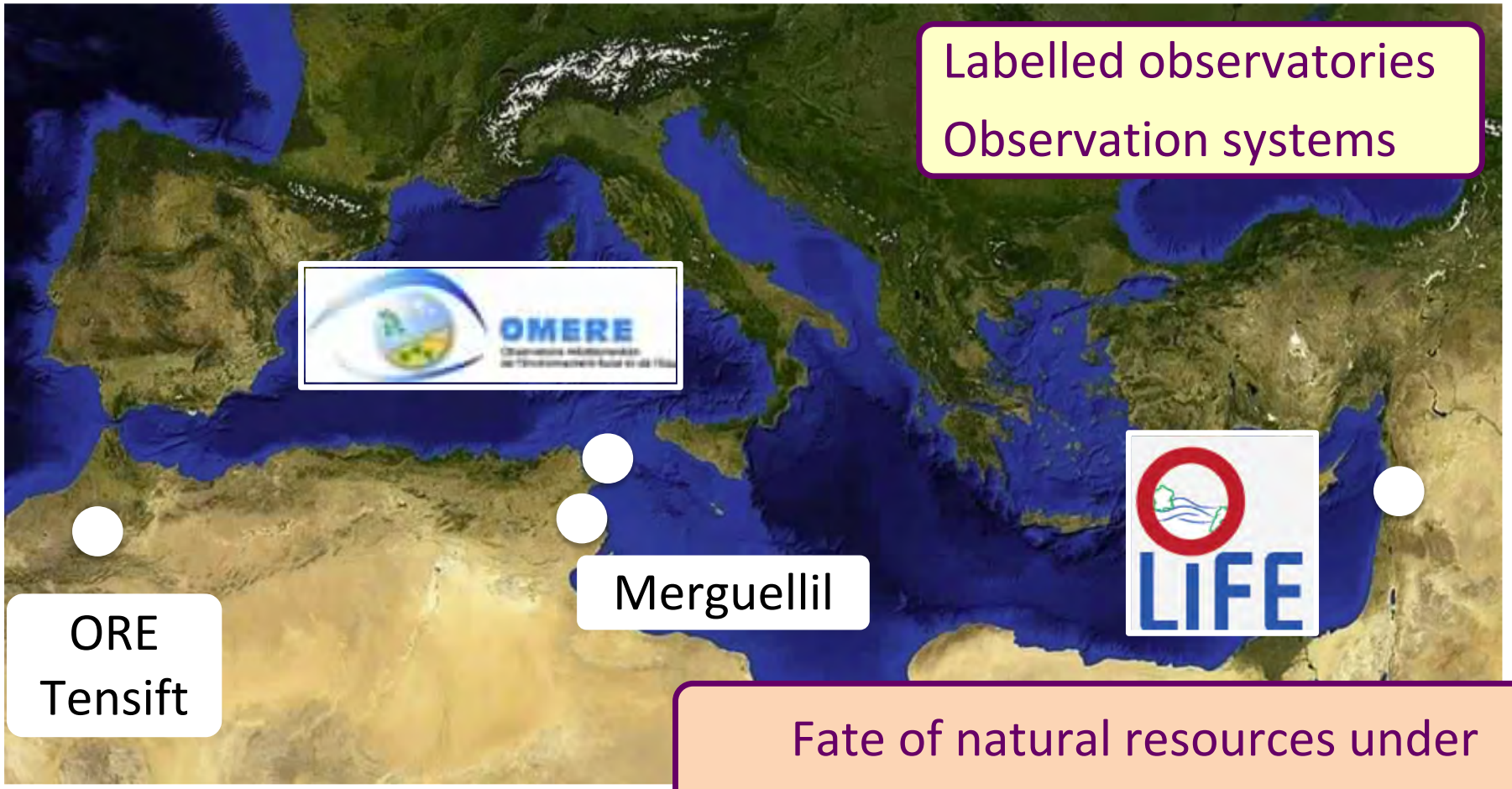
ALTOS: study sites

Features	Catchments of interest (UP stands for upstream part, DW stands for downstream part)			
	Merguellil Centre-Eastern Tunisia	Cap Bon North-Eastern Tunisia	Tensift Central Morocco	Bekaa Eastern Lebanon
Climate	Semi-arid.	Sub-humid / Semi-arid.	Sub-humid / Semi-arid.	Sub-humid / Semi-arid.
Soils	UP: immature, calcimagnesic and isohumic soils. DW: sandy / silty-clay soils.	UP: regosols / vertisol with sandstone / marn outcrops. DW: calcisols on Tyrrhenian deposits	UP: shallow mineral soils. DW: loamy soils on alluvial deposits.	Thick / heavy soil sequence.
Crops	UP: mixed crops, olive trees, rangelands. DW: annual crops, orchards, cereals, gardening.		UP & DW: cereals, orchards. DW: olive trees.	Irrigated summer crops, fruit trees.
Water supply & infrastructures	Overall trends are rainfed on upstream and irrigated on downstream.			Rainfed and irrigated.
	Infill dam, upstream network of hilly lakes, downstream groundwater boreholes.		UP: terraces, river based irrigation, dams. DW: groundwater boreholes.	River irrigation channels, groundwater boreholes.
Hydrological regime	Upstream wadies, branched out network with tributaries, aquifer refills by lakes / dams & irrigation.		Upstream infiltration → sub-surface flows → downstream aquifer.	Limited surface water. Private wells for groundwater pumping.
	Lake & dam drying, cracked aquifer under dam.	No dryness, porous aquifer under dam.		

ALTOS: assets / international joint laboratories



ALTOS: environmental observatories



ALTOS: previous projects

MISTRALS SICMED (M, T)	MTC	P	Monitoring and modelling tools for structures and functioning.
ANR DIGISOL-HYMED (T)		P	Remote sensing methods for mapping soil properties.
EU RISE REC (M, F)		P	Multi-sensor methods for monitoring soil moisture.
ANR AMETHYST (M + T, 2014 - 2018)		P	Integrated analysis: coevolutions of water uses and resources.
FP7-AFRICA-2010 EAU4Food (M + T, 2011-2015).			Participative seminars about practices for increasing irrigated farming food production.
ANR ALMIRA (M + T, 2014 - 2018)		C	Integrated analysis: impacts of land use changes on yield & hydro-erosive fluxes.
ARIMNet 2 VIANA (T + L, 2018 - 2020)		C	Land use related to adoption of agroecological solutions for small irrigated farming.
ERANET-MED CHAAMS (T + M + L, 2019 - 2021)		C	Past & current trends on land use & water governance. Process model calibration.
SAGESSE (M, 2016-2019)		C	Design of decision support systems for water resource management.
Irrig-Bekaa (L, 2016-2019)		C	Methods for quantifying water use by irrigated crops.
CNES / THEIA Sentinel-2 (T, 2016 - 2020)		C	Availability of Sentinel-2 data over Tunisia once pre-processed by French Space Agency.
MISTRALS HighLandDEM (T, 2017 - 2018)		C	Methodologies for producing high spatial resolution DEM.
H2020 VISCA (S, 2017- 2019)		C	Modelling vineyards phenological trend under climate change.

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ALTOS :Results dissemination and exploitation

- Knowledge management strategy
- Data management plan

ALTOS :Results dissemination and exploitation

Table 2.3 (to be continued). Panel of specific actions to be conducted for transferring ALTOS outcomes towards targeted stakeholders.

<table>
<tr><th>Targeted audience→

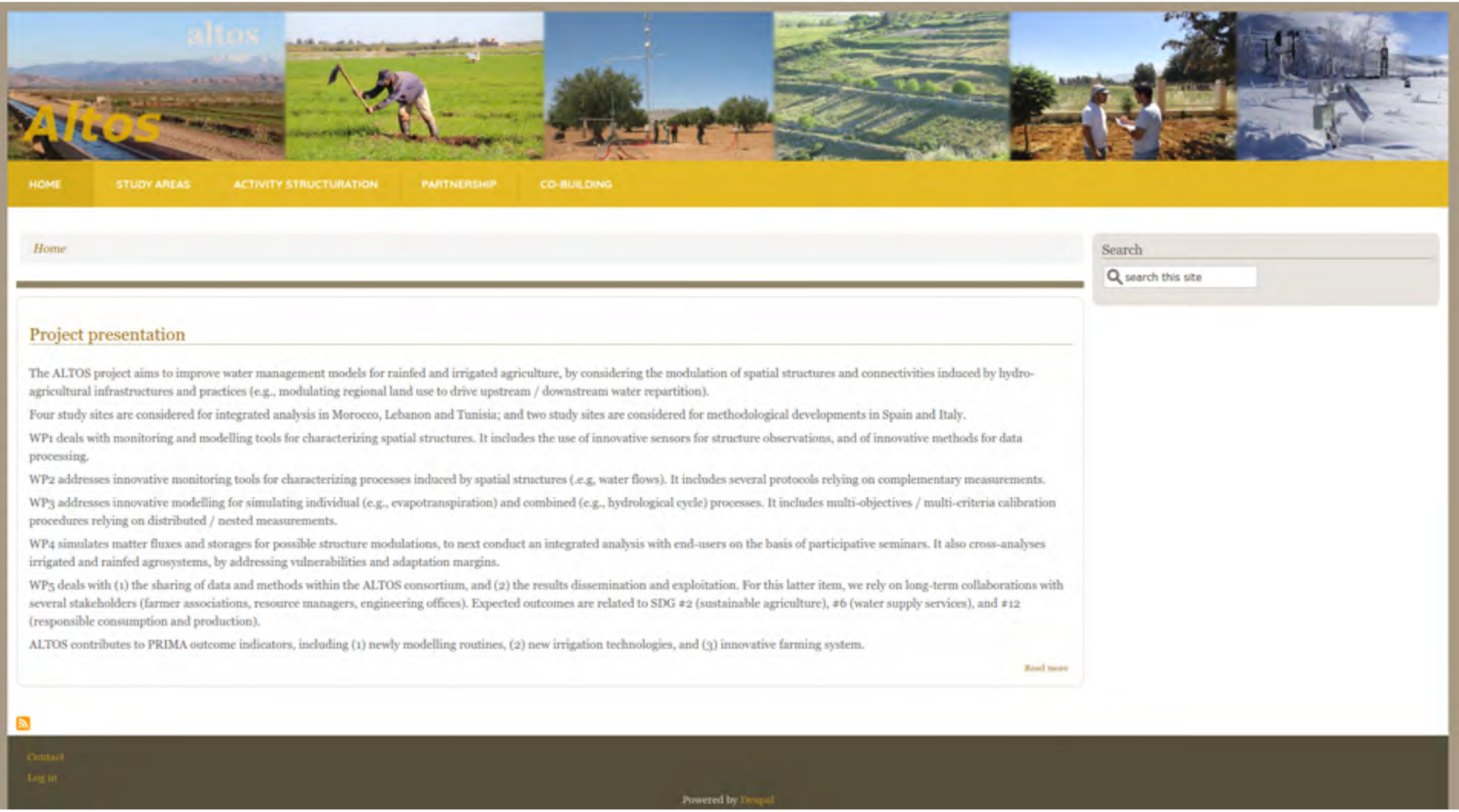
Products ↓</th><th>National directorates (link with ministries)</th><th>Regional directorates (link with governorates and farmers)</th><th>Farmer / water user associations.</th><th>Engineering offices</th><th>Academics</th><th>NGOs and think tanks</th><th>National and international organisations</th></tr>
<tr><td>Monitoring protocols (WP1 & WP2)</td><td colspan="3">• Databases and technical reports about
o infrastructures (reservoir geometries, soil maps);
o fluxes and storages (aquifer levels, reservoir filling, chemical contents).
• Trainings on monitoring systems setup with observatories.</td><td></td><td rowspan="4">• Publications.
• Online databases / user manuals & GITHUB platforms.
• Advanced trainings.</td><td></td><td>Databases for country reports on climate change</td></tr>
<tr><td>Data processing algorithms (WP1 & WP2)</td><td colspan="2" rowspan="3">• Trainings.
• User manuals.
• GITHUB platforms.
• Support to get started.</td><td></td><td rowspan="3">• Trainings.
• User manuals.
• GITHUB platforms.</td><td></td><td></td></tr>
<tr><td>Open source models (WP3)</td><td></td><td></td><td></td></tr>
<tr><td>Simulation tools (WP3)</td><td></td><td></td><td></td></tr>
</table>

ALTOS :Results dissemination and exploitation

Table 2.3 (continued). Panel of specific actions to be conducted for transferring ALTOS outcomes towards targeted stakeholders.

Targeted audience→ Products ↓	National directorates (link with ministries)	Regional directorates (link with governorates and farmers)	Farmer / water user associations.	Engineering offices	Academics	NGOs and think tanks	National and international organisations
Build and assessment of management methods (WP4)	• Database • Technical reports from simulation analysis • Policy briefs on catchment management from participative seminars.				• Publications. • Advanced trainings.	• Technical reports from simulation analysis • Policy briefs on catchment management from participative seminars.	Policy brief on irrigated and rainfed systems
Expertise (WP4)	Tailored						

ALTOS :Results dissemination and exploitation



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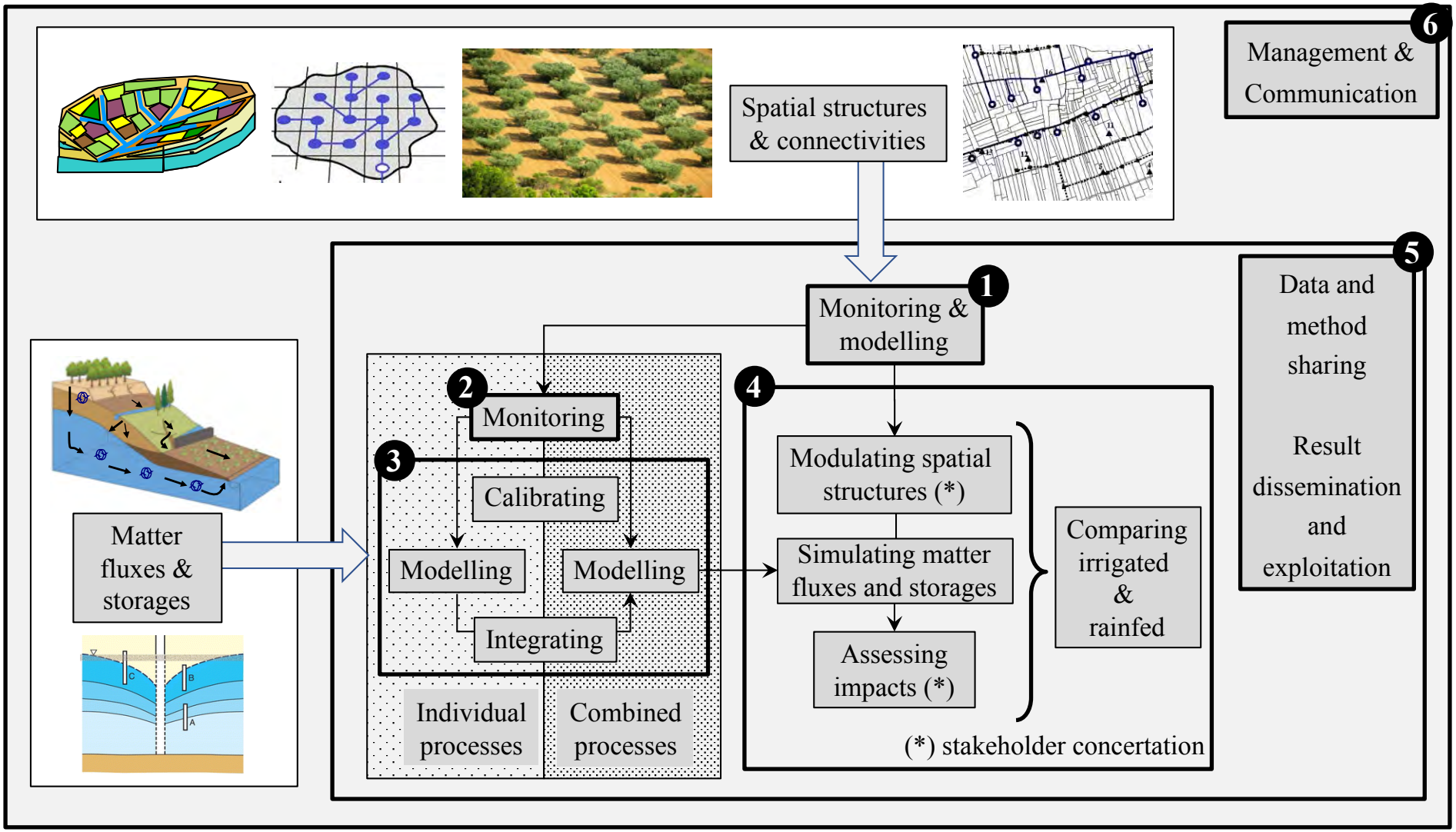
ALTOS: activity structuration



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- To be presented and discussed on tomorrow

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- MCT (leader + PM): monitoring work progress with regard to deliverables and milestone calendar, interacting with PRIMA office about ALTOS. Gather when necessary.
- MB (MCT + partners representatives + task leaders): monitoring strategic steering, make arbitration and final decision if necessary. Gather every 6 months and when necessary.
- Started last year with CA, and today with first MB meeting, to be continues as defined in project.