

## Managing the microbiological contamination of the Thau lagoon

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### Stakeholder involvement



From the summer 2007, the SSA13 scientific team has met with representatives from the local public institution on the Thau lagoon named Syndicat Mixte du Bassin de Thau (SMBT). Together with them, regarding all the sustainability issues that were ranked during the local debates on environmental policies, the following policy issue has been selected:

#### "How and how far mitigate the microbiological contamination of the Thau Lagoon, taking into account local development needs?"

Running parallel to the SPICOSA experiment, the OMEGA-THAU project (\*) has assessed the main contamination sources and the efficiency of the current water treatment systems as regards microbiological contamination.

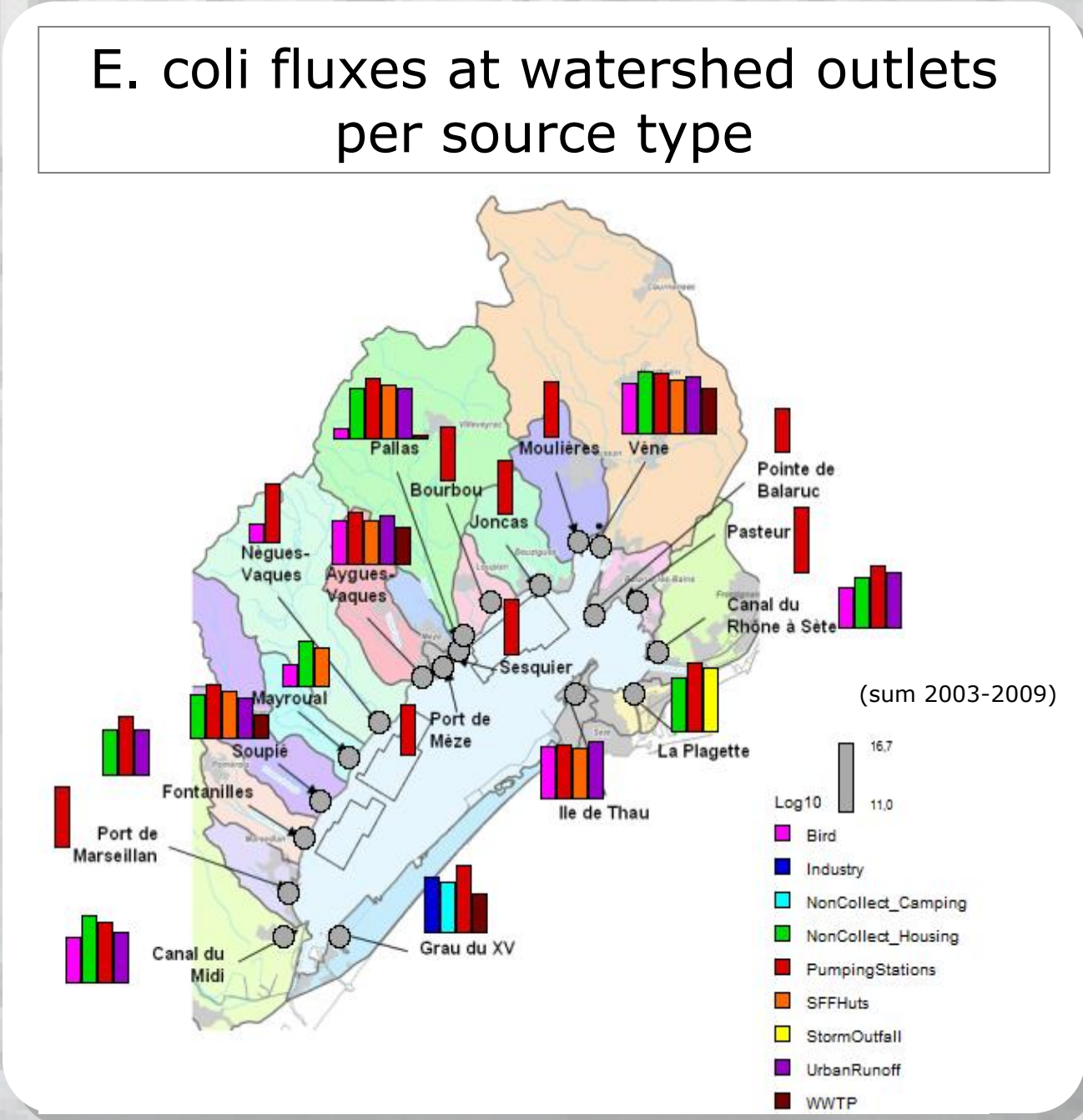
(\*) [http://www.ifremer.fr/lerlr/etudes\\_recherches/OmegaThau.htm](http://www.ifremer.fr/lerlr/etudes_recherches/OmegaThau.htm)

### Ecology-Social-Economy integrated model

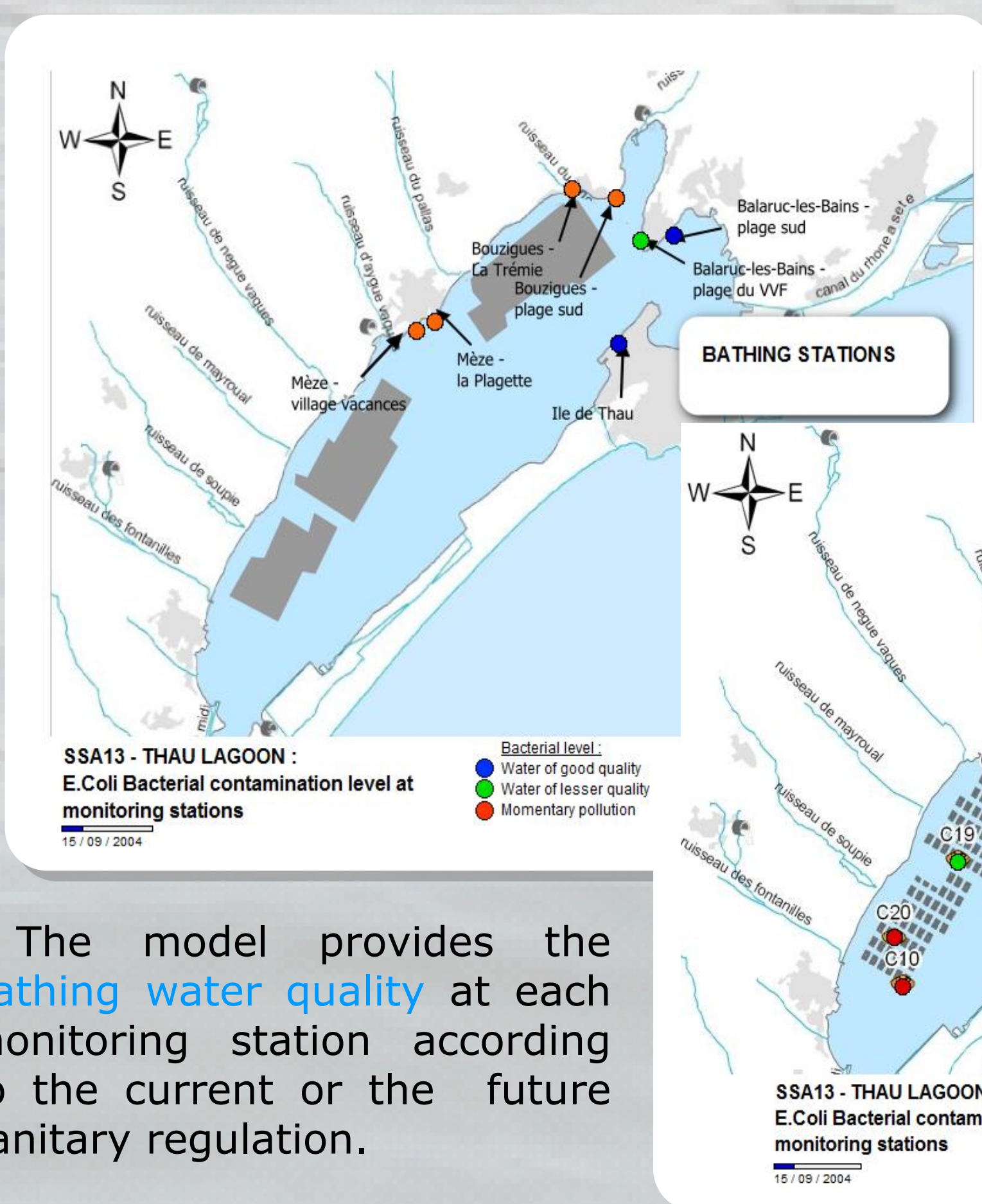
The model has been developed by a multidisciplinary scientific team following the SAF methodology (Design - Formulation - Appraisal - Output).

#### 1 Watershed E.coli sources, flux treatment and transfer

The model uses the detailed database from the OMEGA-THAU assessment to simulate the watershed E.coli sources, their treatment on 19 sub-catchment and their outlet fluxes in the lagoon.



#### 3 Monitoring and regulation of the shellfish commercial bans and bathing closures



The model provides the bathing water quality at each monitoring station according to the current or the future sanitary regulation.

The shellfish sanitary classification (currently B) provides the allowed E. coli concentration thresholds at defined monitoring stations. The model simulates the occurrence of commercial bans.

### The Thau lagoon microbiological issue



The Thau lagoon suffers from a degradation of its water quality by a rapid demographic growth, an important seasonal influx due to tourism and failures in the water treatment system, leading to commercial bans for the shellfish farming activity and regular closures of the bathing areas.

The local policy framework has been set up by the Territorial Management Plan (SCoT), which defines the general objectives of the lagoon management:

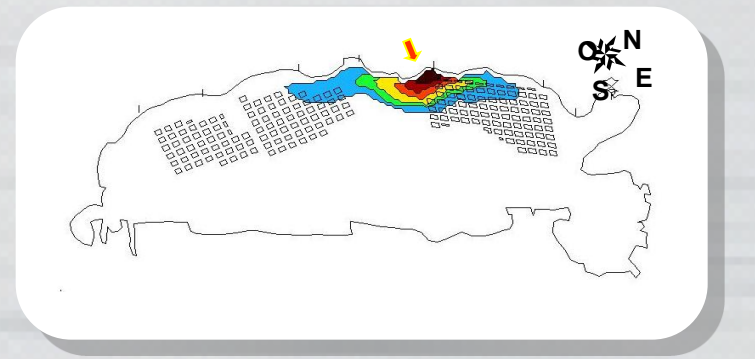
- economic development, including tourism and thermalism;
- environment preservation, including water quality and ecosystems protection;
- maintaining the cultural patrimony, including traditional activities (shellfish farming, fisheries activities in the lagoon, recreational activities).

- The local water management plan (SAGE) defines several specific objectives for the environment policy, one of which is the reduction of microbiological contamination, through :
  - considering the sanitary classification of the Lagoon (A or B) and the occurrence of commercial bans for the shellfish farming industry,
  - anticipating the regulatory changes of the bathing waters classification and their impact on the occurrence of bathing bans of the beaches rounding the lagoon.

**The current political debate regards the ways this objective of contamination mitigation could be translated into operational management options, taking into account the social acceptability of residual impacts.**

#### 2 Microbiological contamination of the lagoon

In the Thau lagoon, the hydrodynamic transport requires the use of a 3D-model. However, the contribution of watershed outlets fluxes to microbiological concentration at monitoring stations are additive and enables the use of transport functions calculated off-line with IFREMER Mars-3D (Model for Applications at Regional Scale).



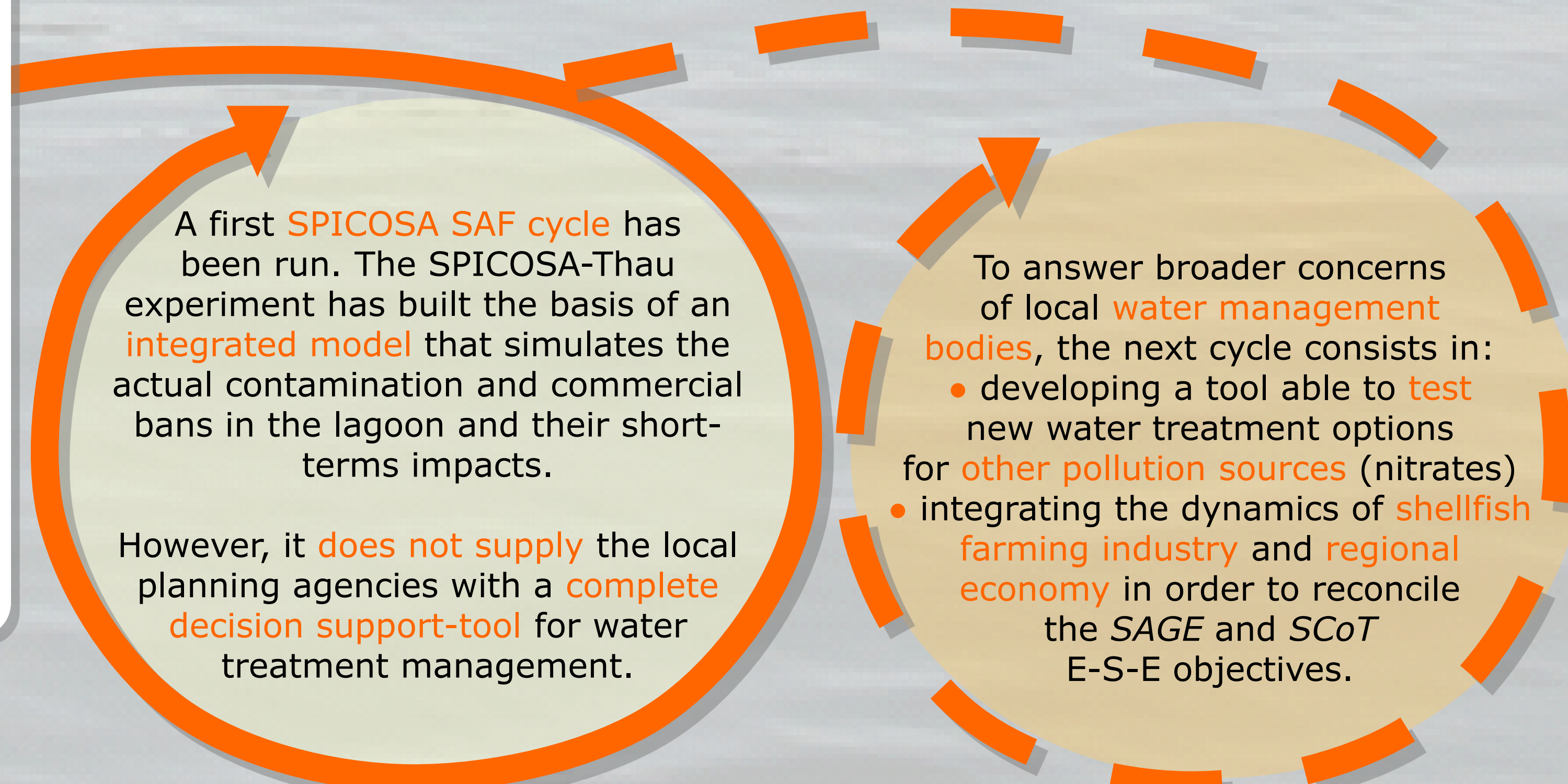
#### 4 Scenarios & integrated assessment

- Scenarios consider changes in the regional economy based on a Prospective Macro-economic Model (called MEPP) and different management options for pollution mitigation.
- Cost-effectiveness analyses of management options integrate an assessment of residual impacts (commercial bans and beach closures).

#### 5 Shellfish farming vulnerability

- The model calculates two economic indicators for shellfish farms :
  - The global revenue losses of companies potentially impacted by commercial bans.
  - The distribution of companies depending on their degree of vulnerability to commercial closures. Vulnerability is a multi-factorial status, which refers to the whole different shocks that individuals may support depending on exposure, sensibility and coping capacity.

### System Approach Framework process



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