EU-India STI Cooperation Days

8-9 November 2012, Hyderabad

www.euindiacoop.org/2012

AtWat

Advanced Tools for Water Treatment

Advanced modelling, control and decision support tools for flexible and optimal wastewater treatment plants

This event is co-financed by the European Commission through the involvement of several projects.

A joint event organizated by:

Hosted by National Geophysical Research Institute (NGIR - CSIR).

AtWat partners

- India
  - CSIR-NCL Pune (**Vivek Ranade**)
  - NIT Tiruchirappalli (Seshagiri Rao)
  - Pondicherry Engineering College (Raman Saravanane)
- EU
  - BIOMATH – Ghent University, Belgium (**Ingmar Nopens**)
  - Lequia - Univ. de Girona, Spain (Quim Comas, Ignasi Rodriguez-Roda)
  - Catalan Water Agency, Spain (Jordi Robusté)

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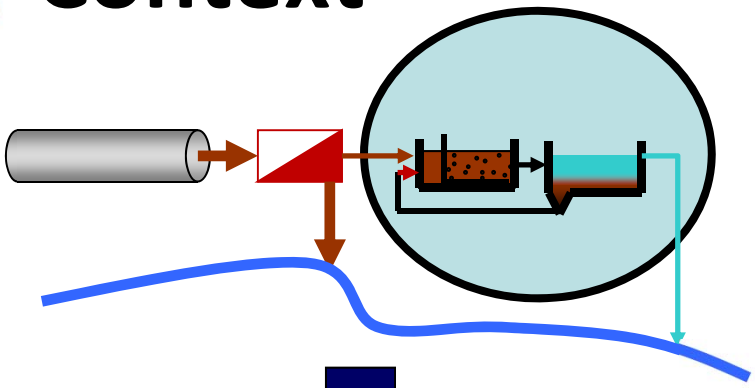
Context



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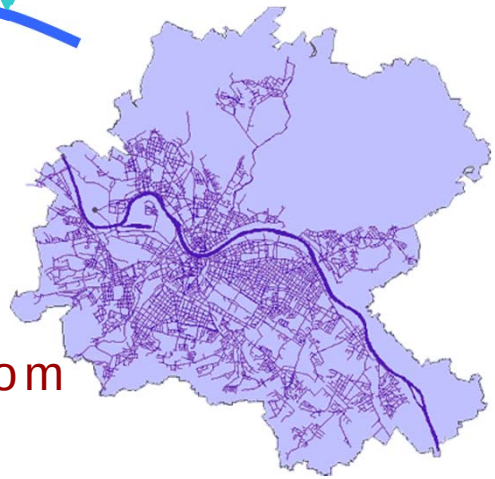
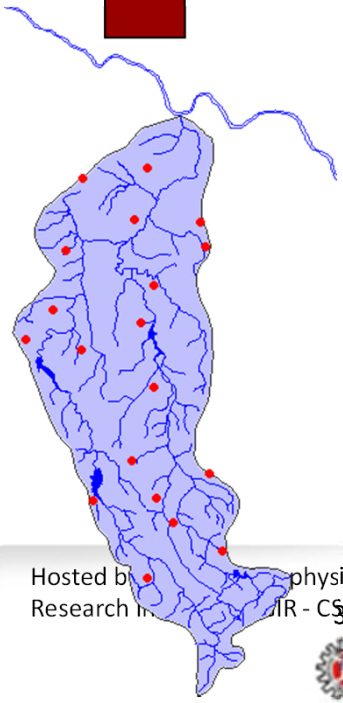




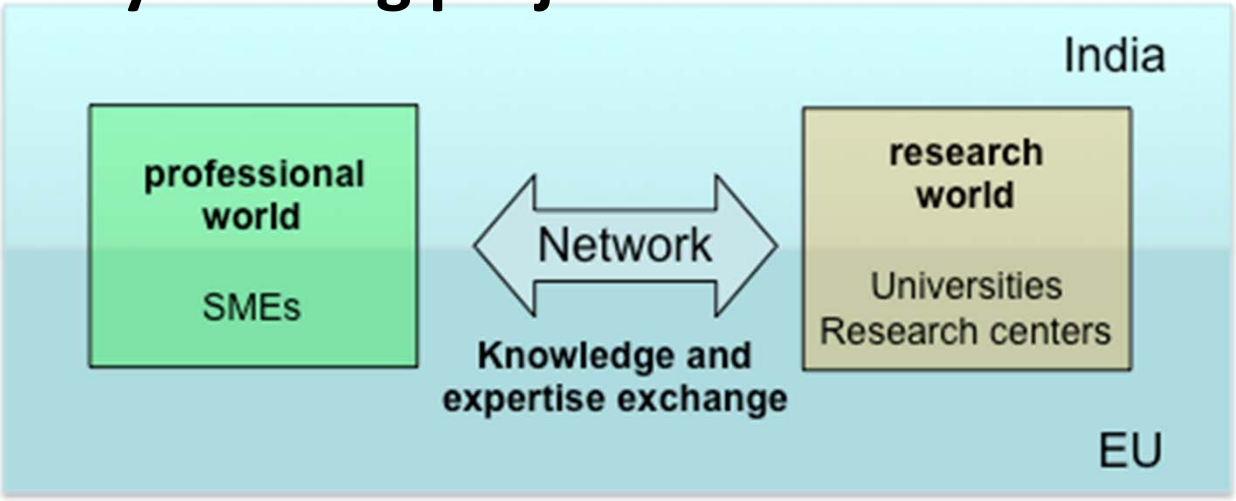
→ More degrees of freedom

Emission

Objectives

- **Create** a EU – India **network** to improve sustainable wastewater management in both regions

- **Exchange ideas and expertise** and embed them in **currently running projects**



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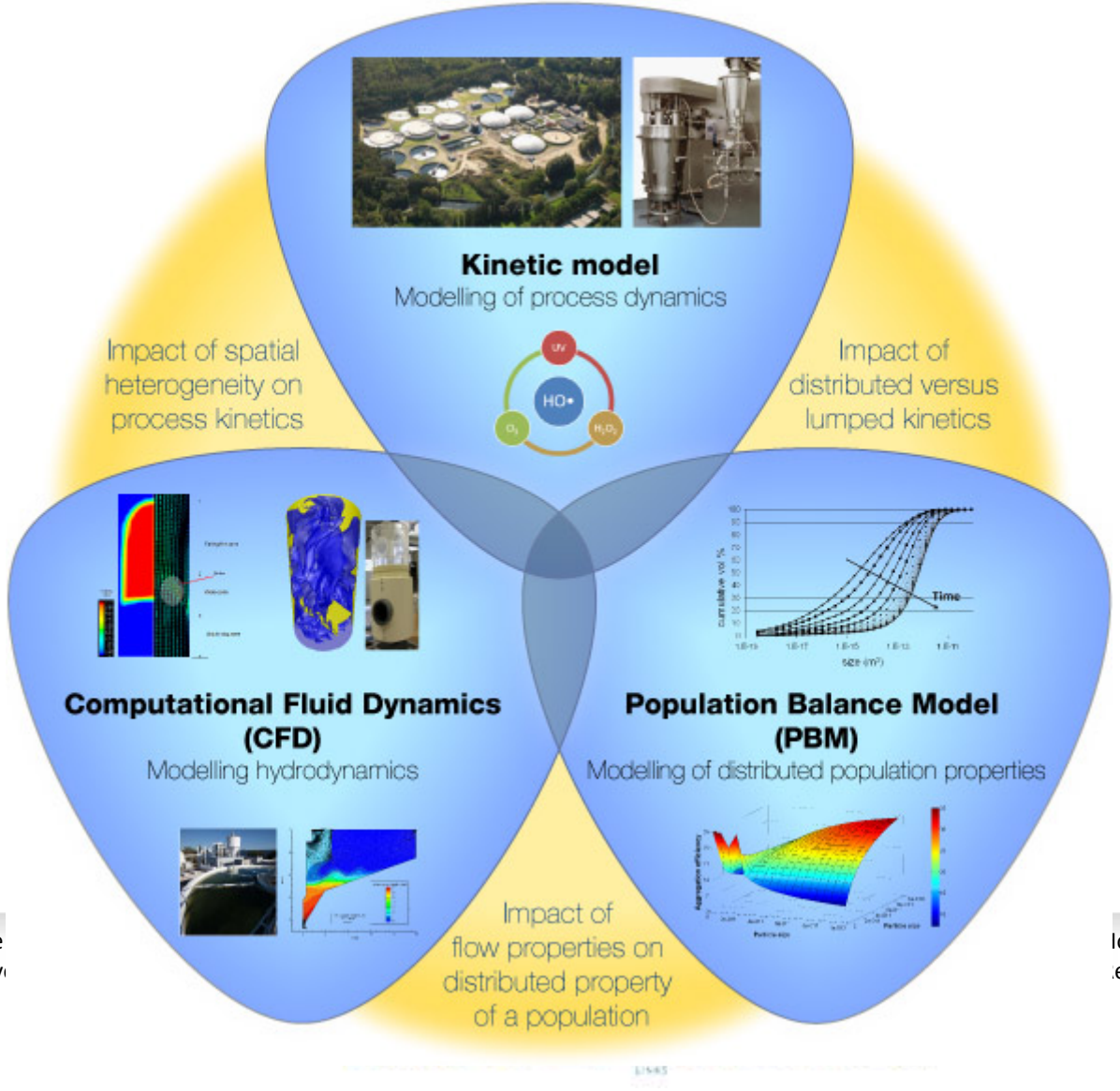
Advanced modelling



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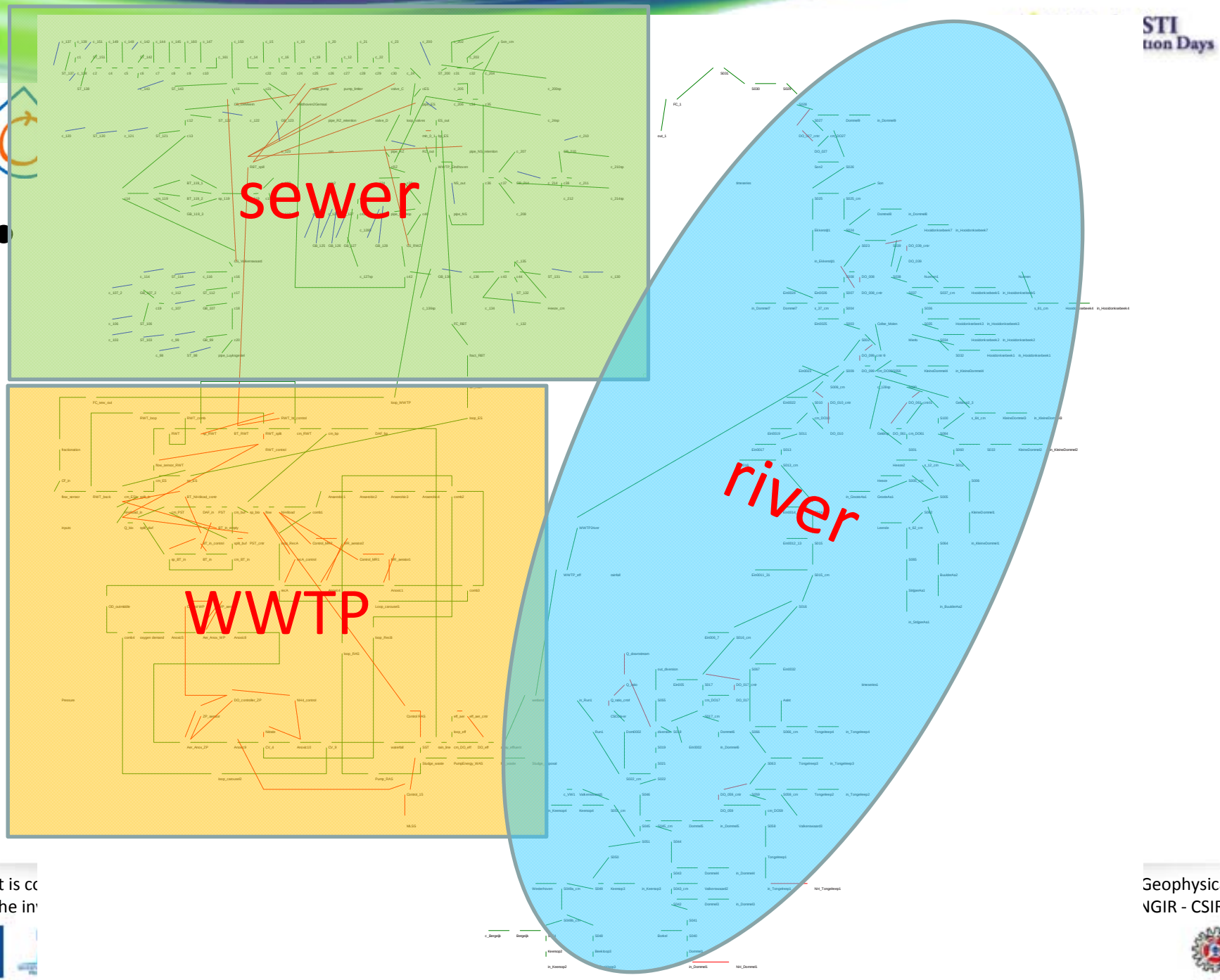

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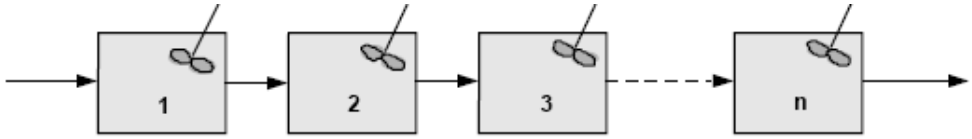
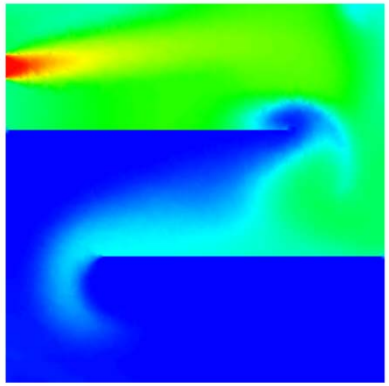
Advanced modelling

- Mixing



- CFD-biokinetics



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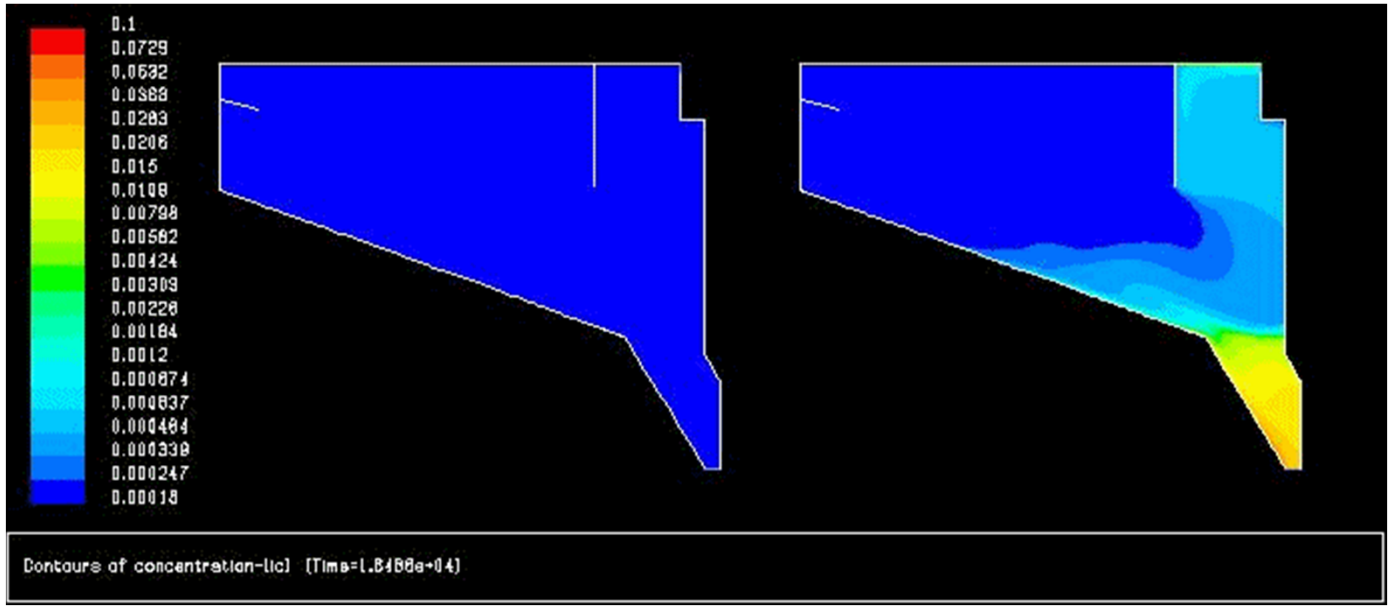
Advanced modelling

- Settling



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Advanced control

- Nonlinear analysis to study the effect of the external and internal recycle flow rates on the operability.
- Cascade control strategy to improve the closed loop performance.
- Effect of measurement time delays on the plant performance.
- A comprehensive study on whether complex control schemes are really required for efficient operation of WWTP.

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Decision support: rationale

- ✓ **Progress in**
  - control engineering
  - computer technology
  - process sensors

  →
  - Enable advanced control
  - Increase amount of data

- ✓ **Data/Information** →
  - acquired
  - understood
  - integrated
  - learned

- ✓ **Operational problems** →
  - reasoning
  - experts language

- ✓ **Process experience** →
  - empirical knowledge
  - reuse

DECISION SUPPORT TOOLS

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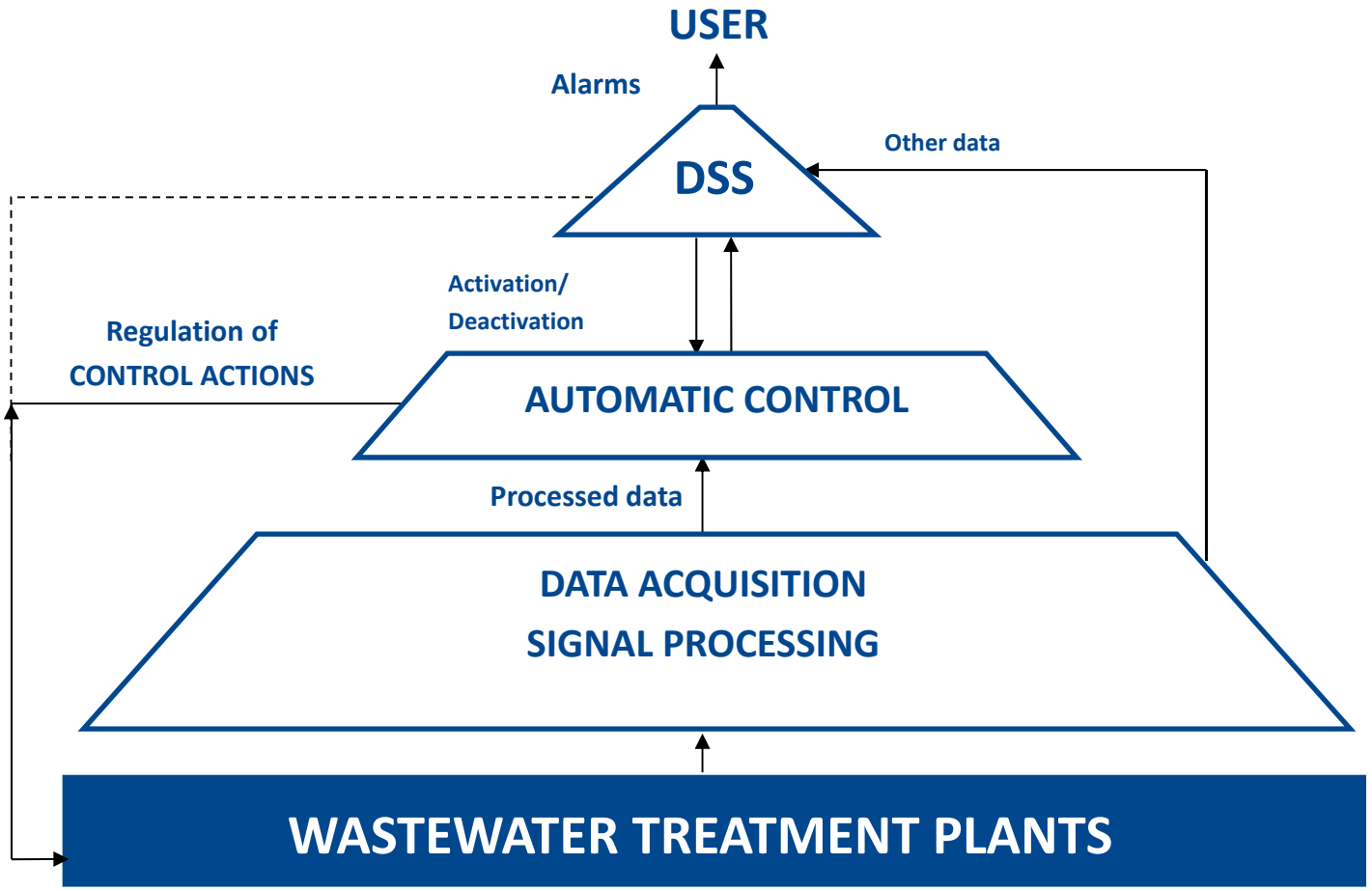
Decision support: architecture



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Deliverables

- Establishment of a Indo-European Network (website, LinkedIn)
- Dissemination through workshops, webinars, publications in high reputed journals and oral/poster contributions
- New joint research project proposals (EU-FP7, bilateral programs between India and Belgium-Spain, funding from industries, CSIR-NCL and DST, India)
- Summer school (long-term)
- Exchange programs (e.g. Erasmus) for students (MSc, PhD), co-tutelle PhDs
- Broad impact on WWT practice, research field and education

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Work Plan

- *November 2012*: kick off meeting at Hyderabad
- ***January 2013*: workshop at NIT Trichy + brain storm on project proposal**
- *June/July 2013*: UdG, Girona
- *December 2013*: meeting at PEC, Pondichery + finalize project proposal
- *April 2014*: workshop at UGent (in conjunction with WWTmod2014)
- *October 2014*: closing meeting at CSIR-NCL, Pune

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1st Workshop: Jan 28-29 2013

- Location: NIT Tiruchirappalli (Seshagiri Rao)
- “Advanced Modelling Tools for Wastewater Treatment”
- Scope
  - WWT technologies, modelling incentives
  - Current state-of-the-art/challenges in WWT India/Europe (municipal and industrial)
  - Succesful case studies (ASP (an)aerobic, MBR, AOP,...)
  - Perspectives in modelling (CFD, IUWS, climate change,...)
  - Panel discussion

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Acknowledgement

- New Indigo
- Flanders Research Fund (FWO - Belgium)
- Ministry of Economy and Competitiveness (Mineco - Spain)
- Department of Science and Technology (DST - India)

- More info
  - http://stories.newindigo.eu/stories/atwat/
  - Dedicated AtWat website to be launched
  - AtWat private LinkedIn group to be launched