



Modelling of Reactive Secondary Settling Tanks



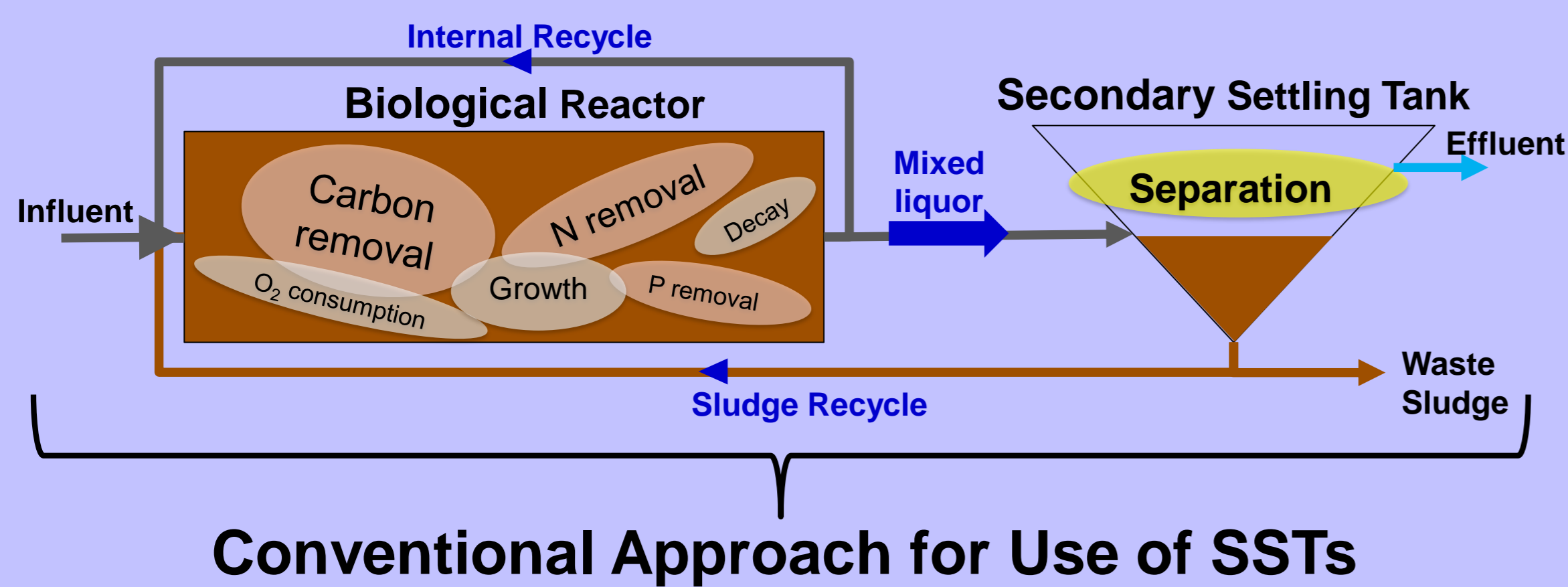
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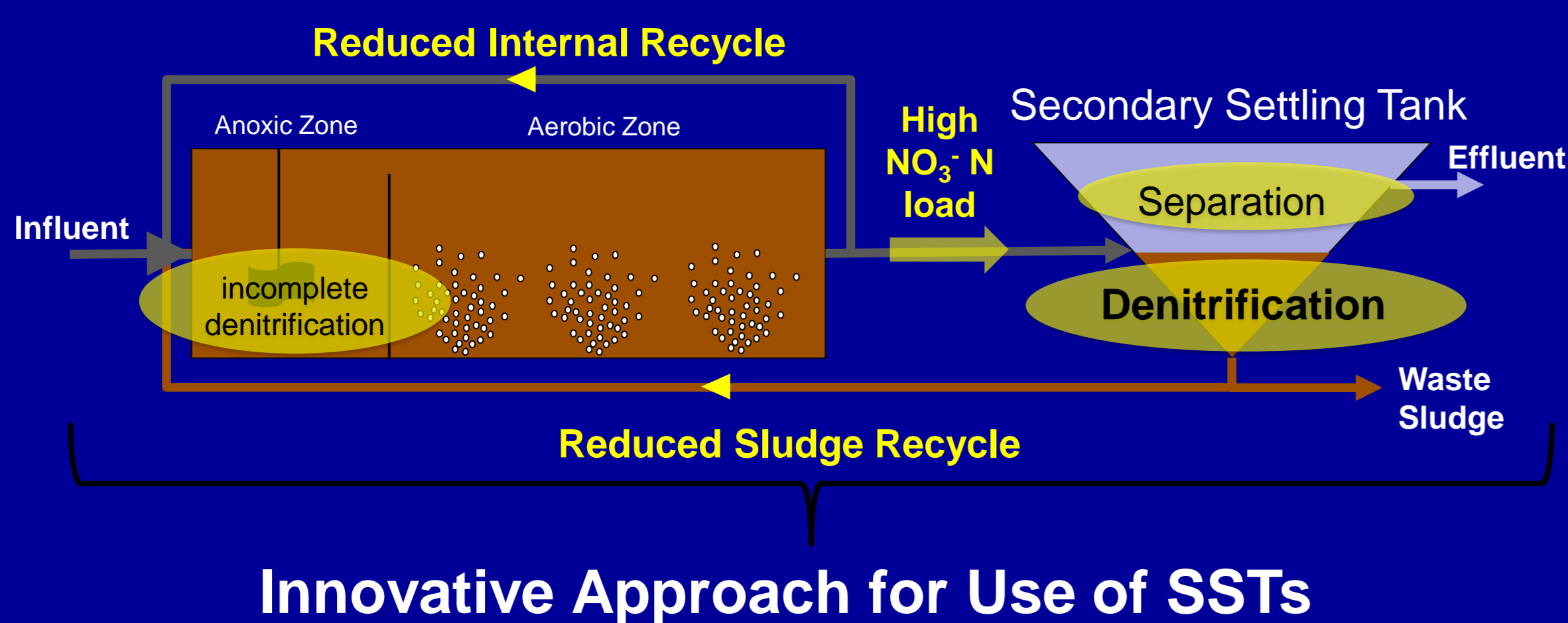
Introduction

Secondary settling tanks (SST) are used for the gravity separation of microorganisms from the effluent in WRRFs.



However,

- ✓ An important amount of overall biomass in the SST
- ✓ Biological activity can be initiated
- ✓ Large volume of SST is suitable for biological processes
- ✓ Anoxic conditions exist



Potential Advantages

Potential Disadvantages

- Reduced pumping energy
- Reduced operational cost
- No investment cost
- Retrofitting potential



Operational problems in reactive settling process

- Rising sludge
- Hard operational control

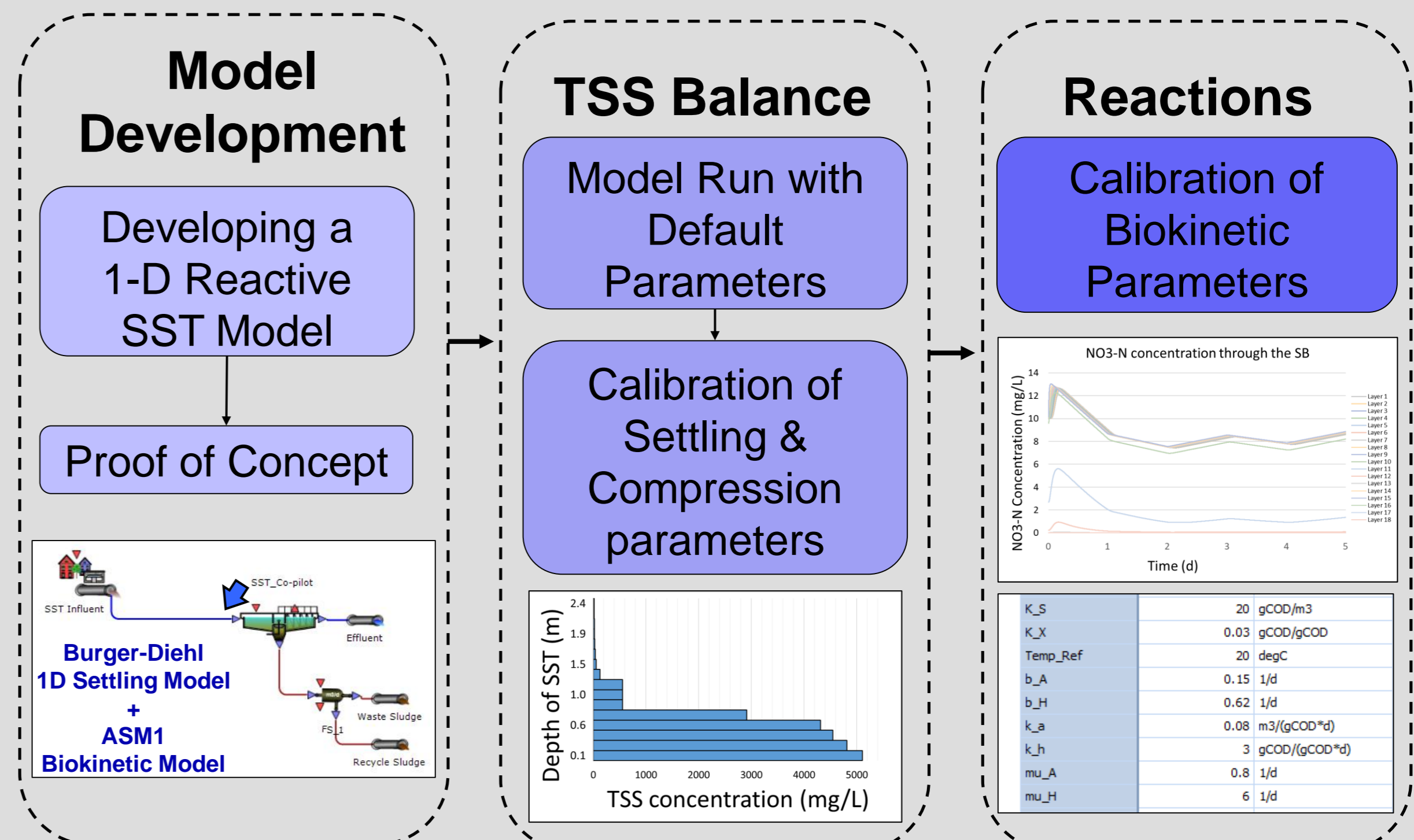
- ✓ Significant potential for denitrification in the SST but optimum operational conditions & NO₃ loads need to be determined.

Why do we need Modelling of Reactive Settling?

- Improve overall N removal in WRRFs
- Better prediction of effluent characteristics
- Better prediction of settling behavior
- Scenario analysis for energy optimization

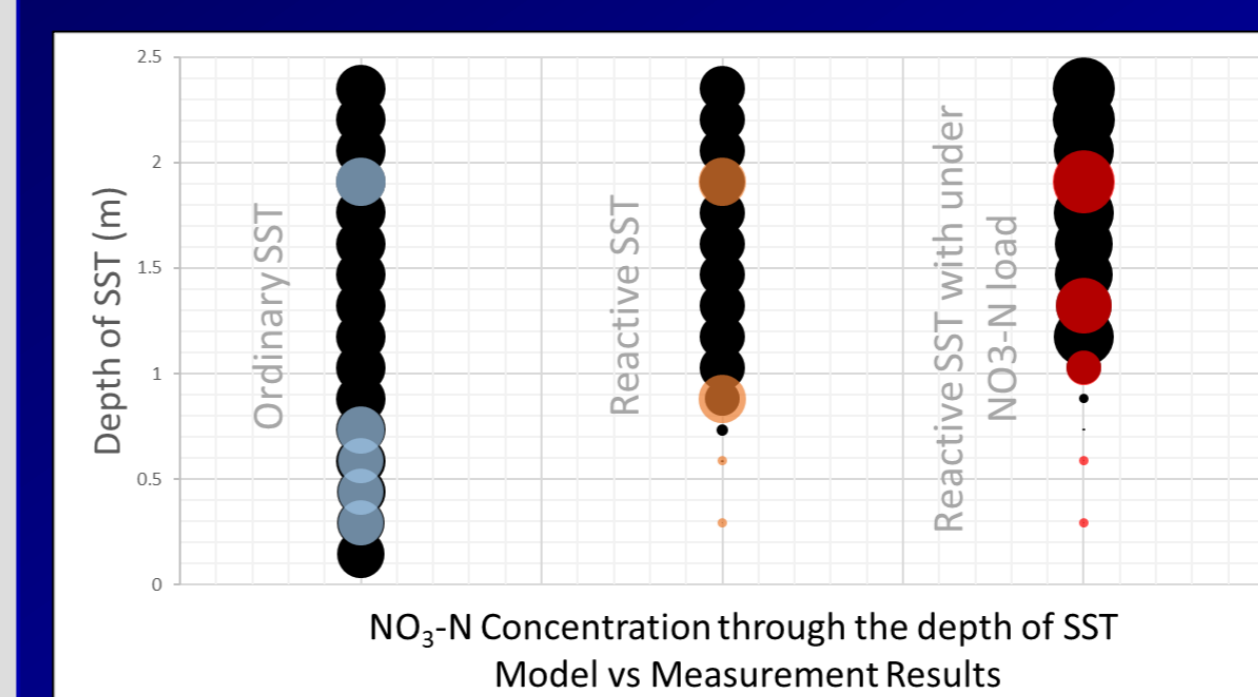
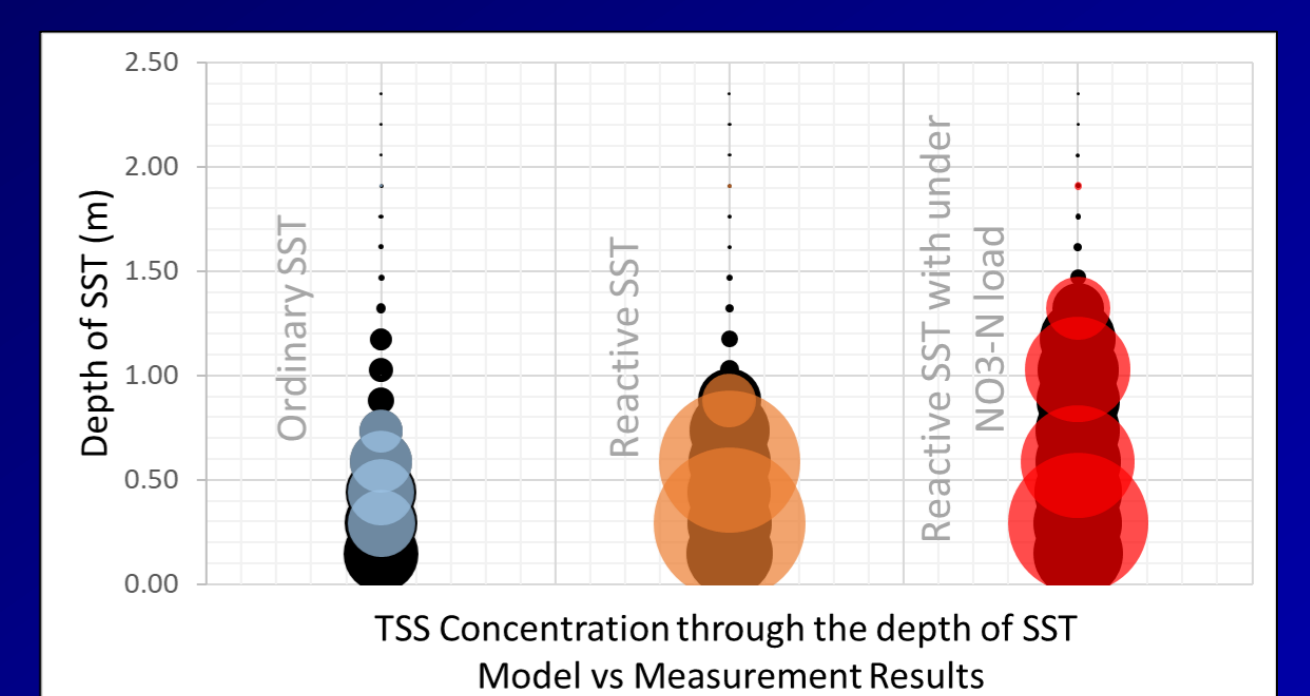


Modelling Methodology for Reactive Settling



Results & Conclusions

- The developed reactive settler model is able to represent sedimentation & compression processes in SSTs, in combination with reactions.



- The NO₃-N concentration decreases due to the active denitrification process in the deep layers of the SST where biomass concentrations are high.