SIMCAT Modelling

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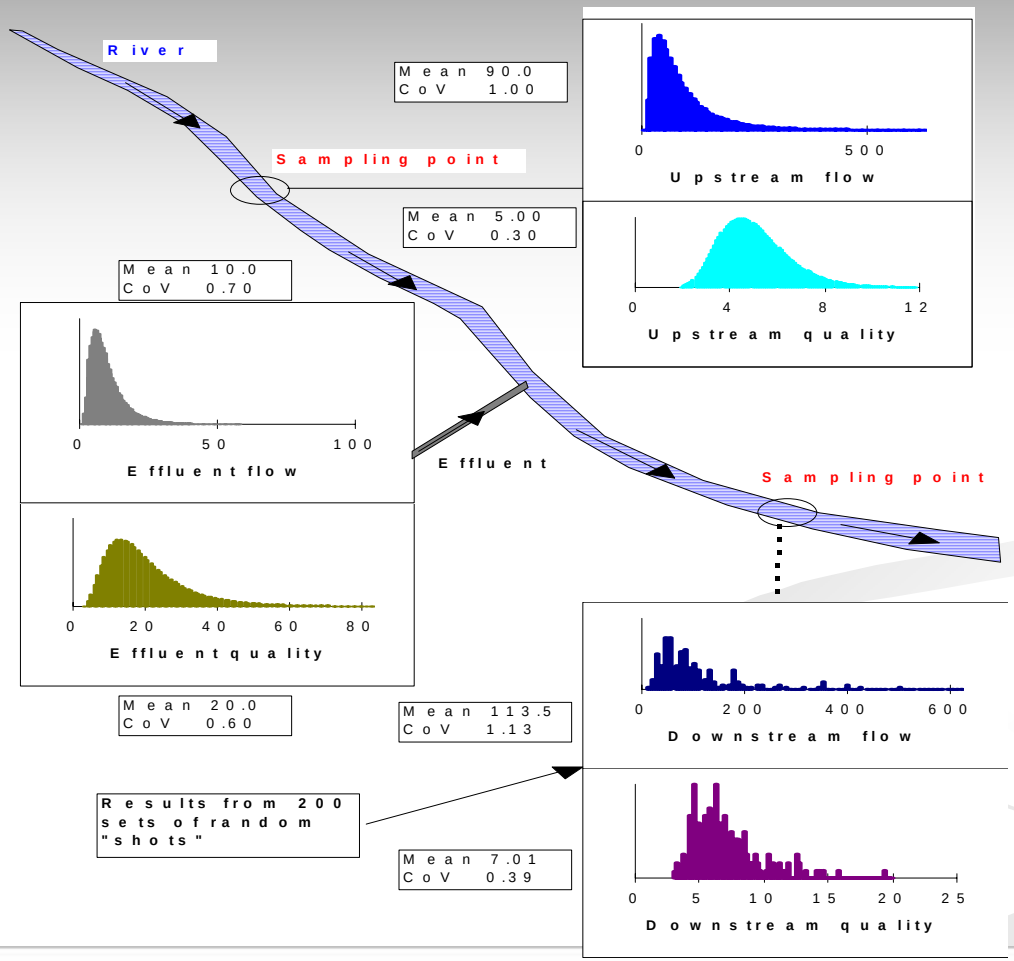
Summary of Presentation

- What is SIMCAT
- How it works
- Its use in water quality planning
- Scenarios in the Foyle Catchment
- Advantages of SIMCAT modelling

What is SIMCAT?

- A linear river quality model to simulate the flow and quality at any point in a river catchment
- Used to assess the impact of discharges on river quality.
- River water quality, discharge quality and flow expressed in statistical terms

The ‘Combined Distributions’ Method used by SIMCAT



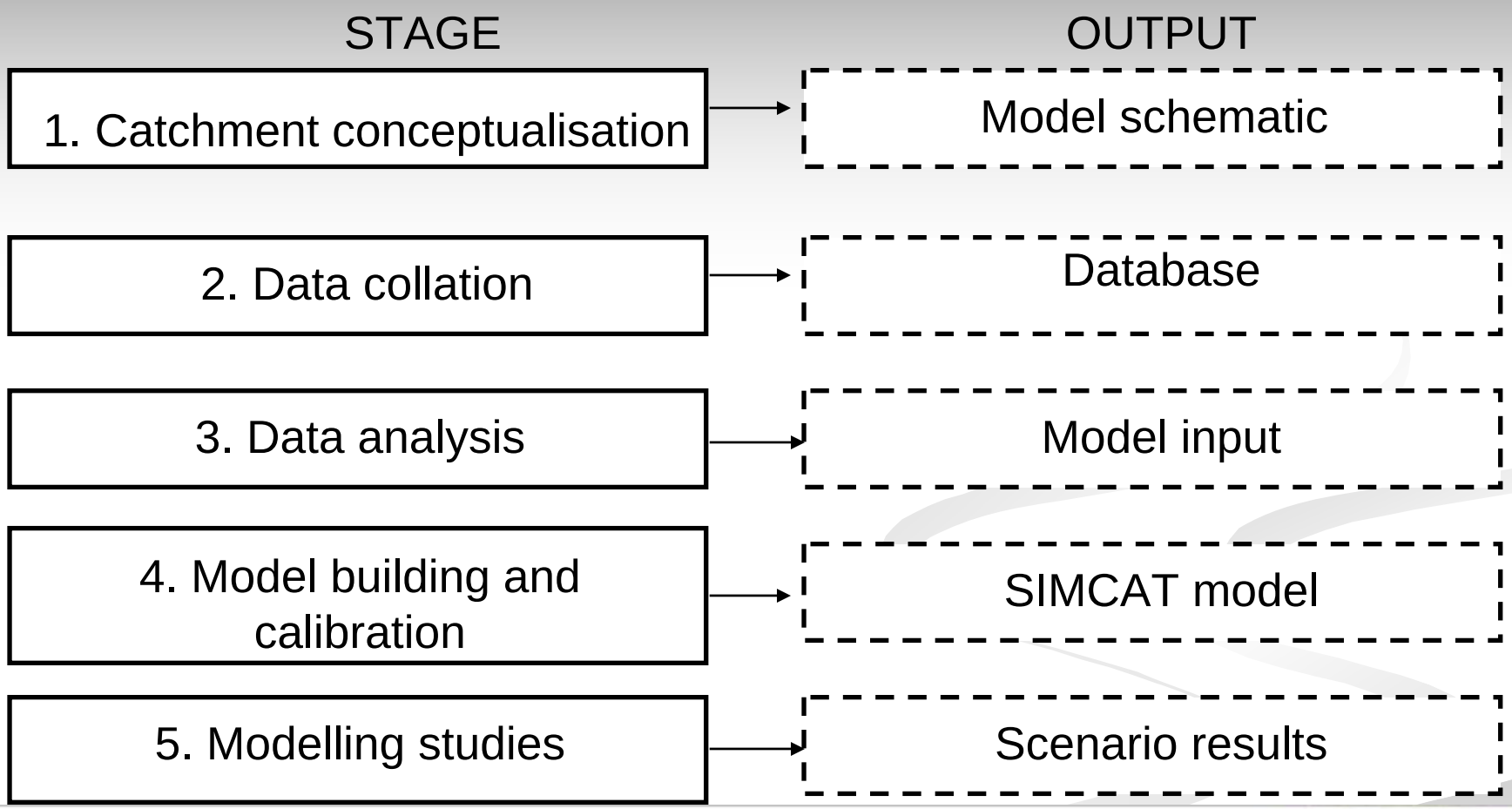
SIMCAT - Employs

- river flow and quality
- flow and quality of point source discharges
- diffuse sources of pollution
- behaviour or pollutants
  - conservative
  - non conservative
- statistical distributions and Monte Carlo simulation approach

Application of SIMCAT

- Better understanding of causes of river quality problems
  - impact of discharges and diffuse inputs
  - unknown sources
  - improved monitoring programmes
- “what if” scenarios
  - setting discharge consents to achieve water quality targets
  - water quality resulting from specified discharges

Developing a SIMCAT Model



The Foyle Catchment

Features Included in the Foyle Model

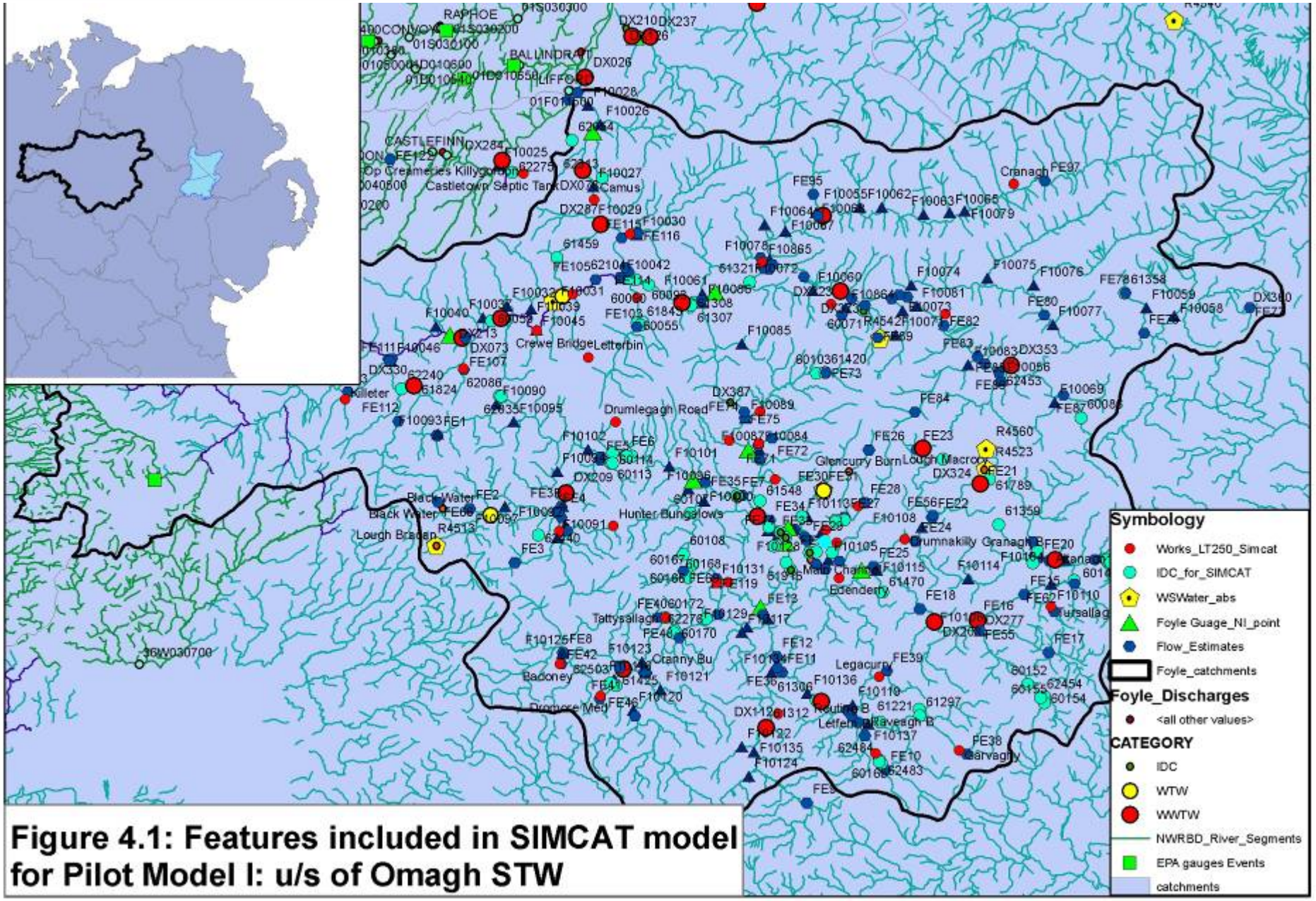


Figure 4.1: Features included in SIMCAT model for Pilot Model I: u/s of Omagh STW

SIMCAT Model Features

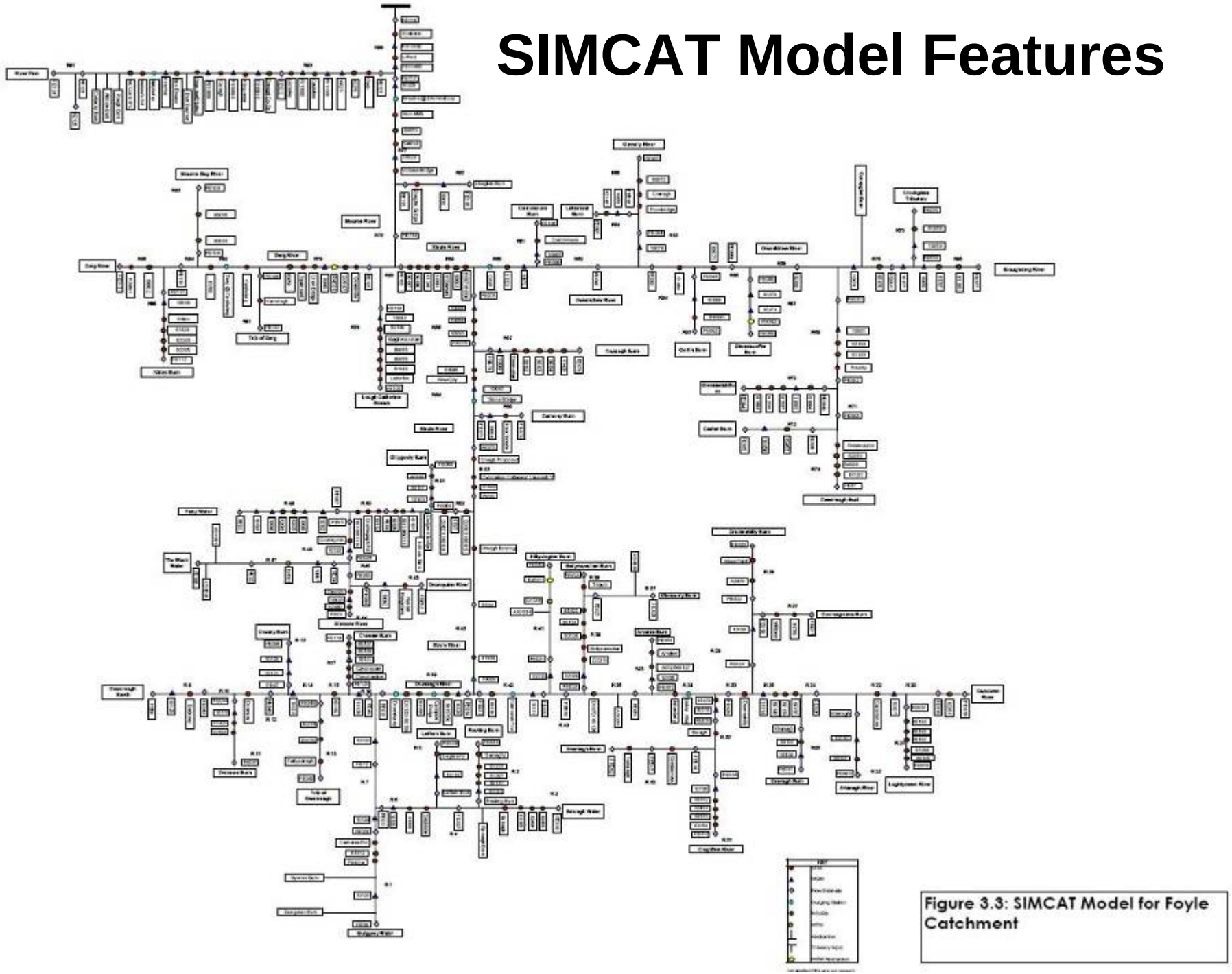
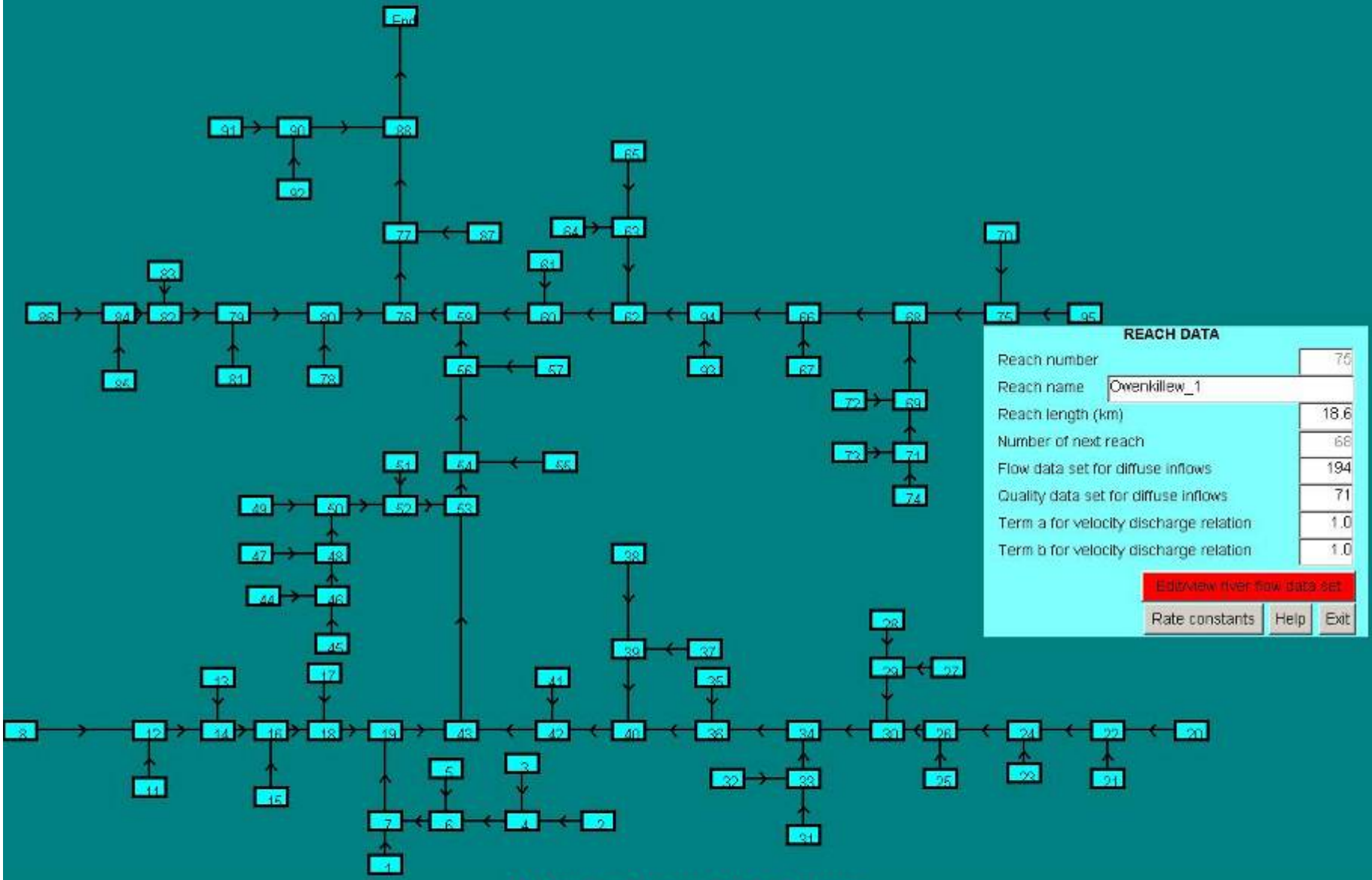


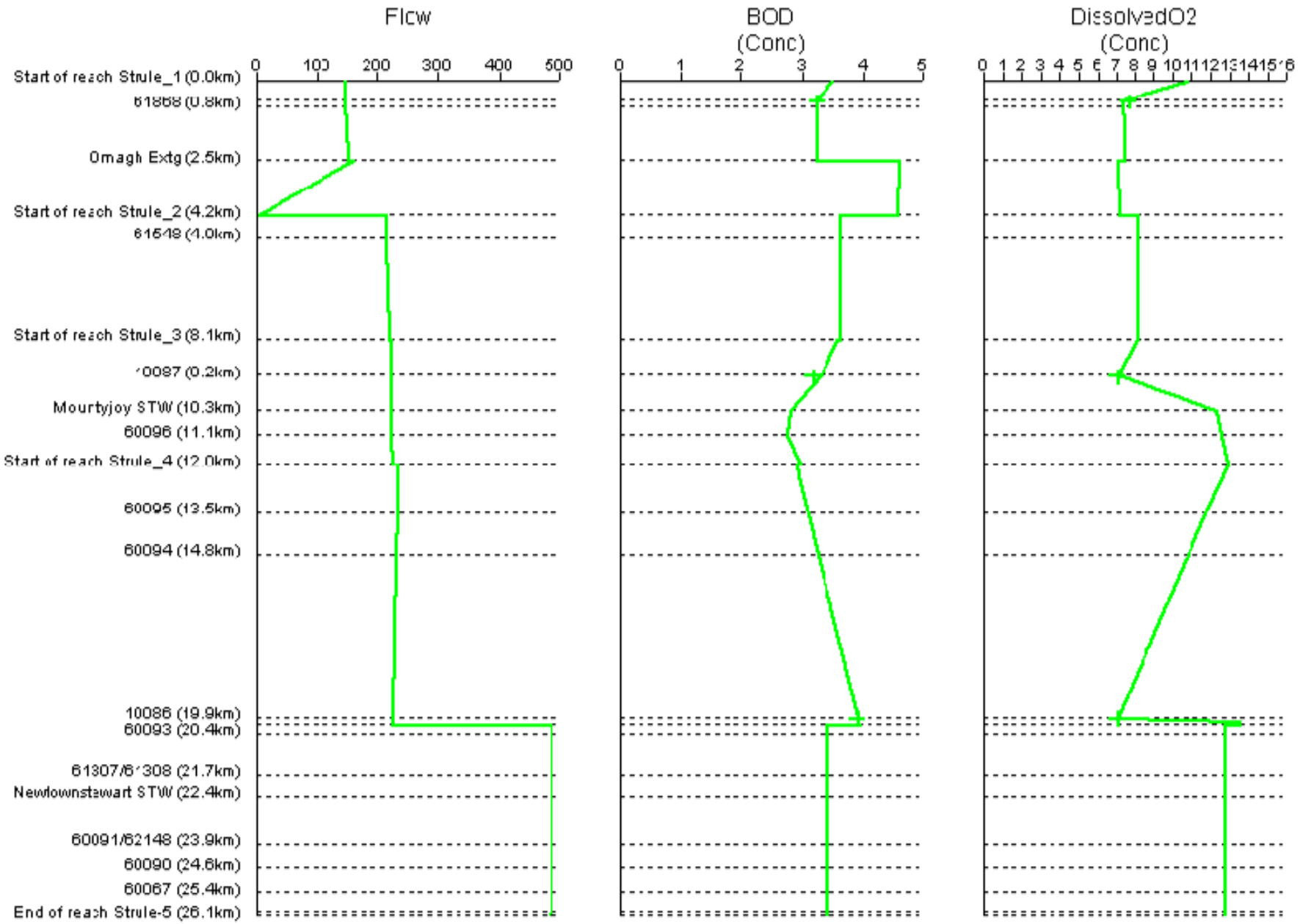
Figure 3.3: SIMCAT Model for Foyle Catchment

Foyle SIMCAT Model Schematic



SMCAT RESULTS
Date: 17/03/2008

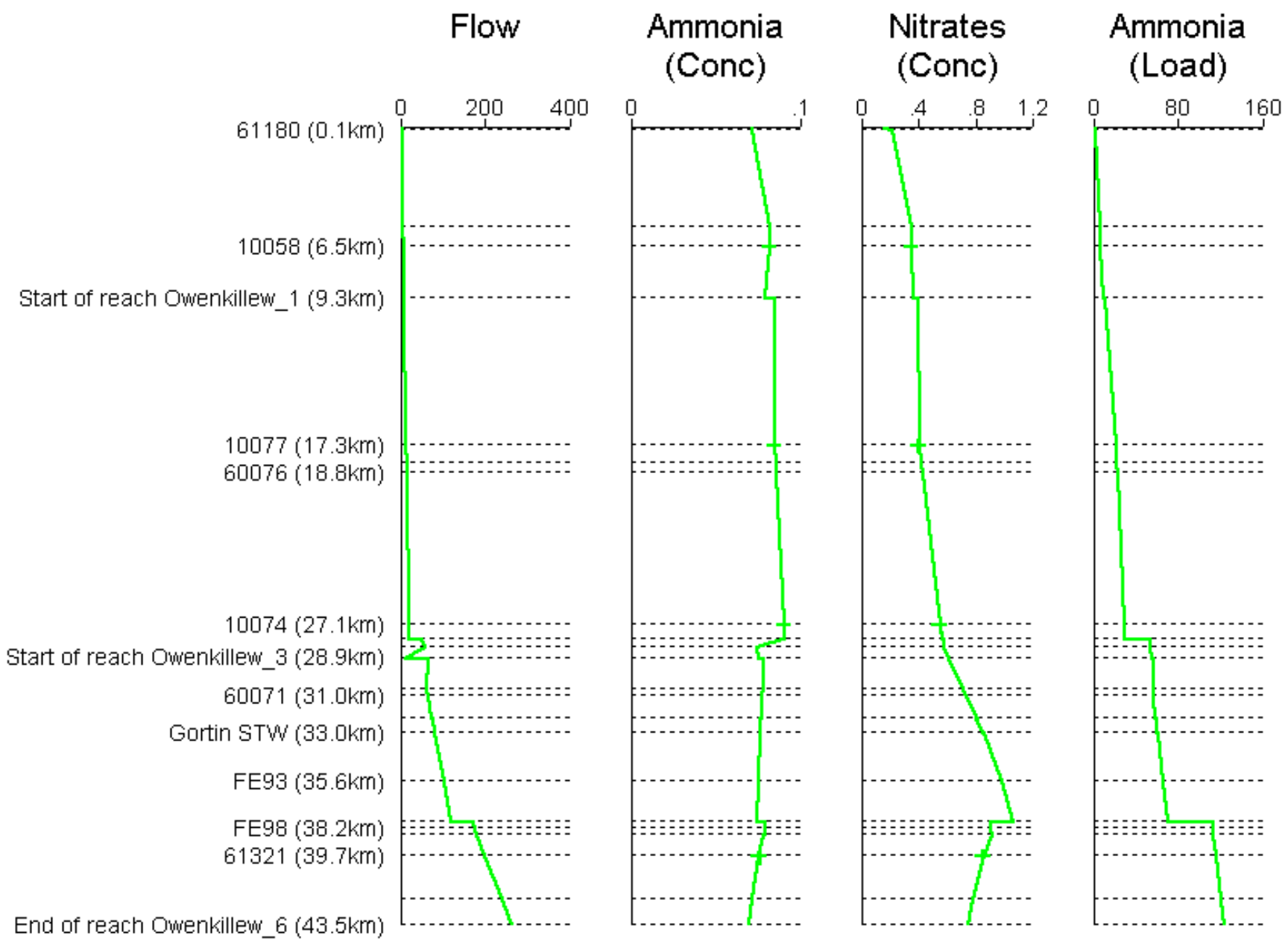
Pilot Model 2 - Upstream of Strabane STW



KEY: 95% values Quality targets Observed values

SIMCAT RESULTS
Date: 18/03/2008

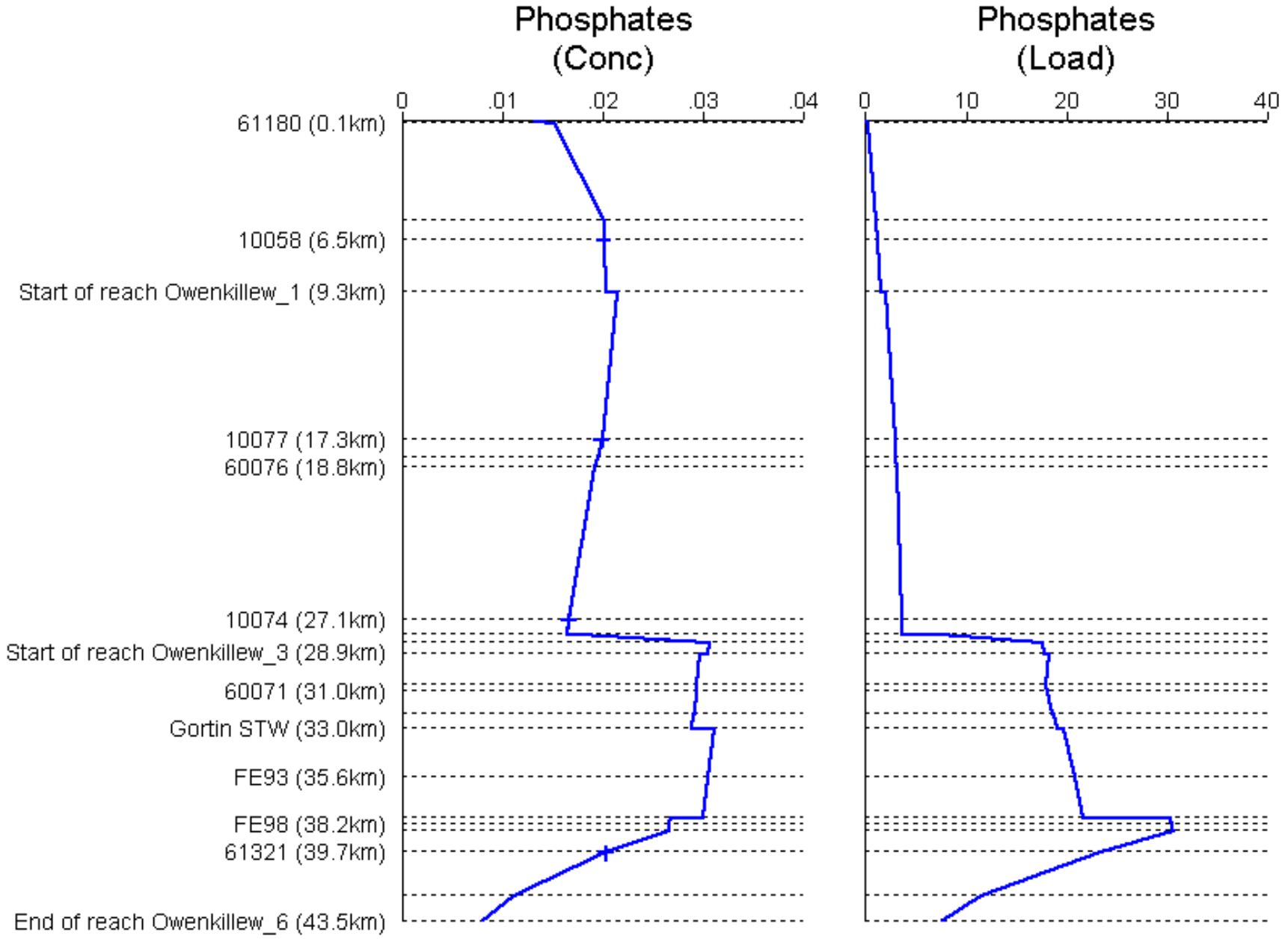
Pilot Model 2 - Upstream of Strabane STW



KEY: 90% values (95% flows) Quality targets + Observed values

SIMCAT RESULTS
Date: 18/03/2008

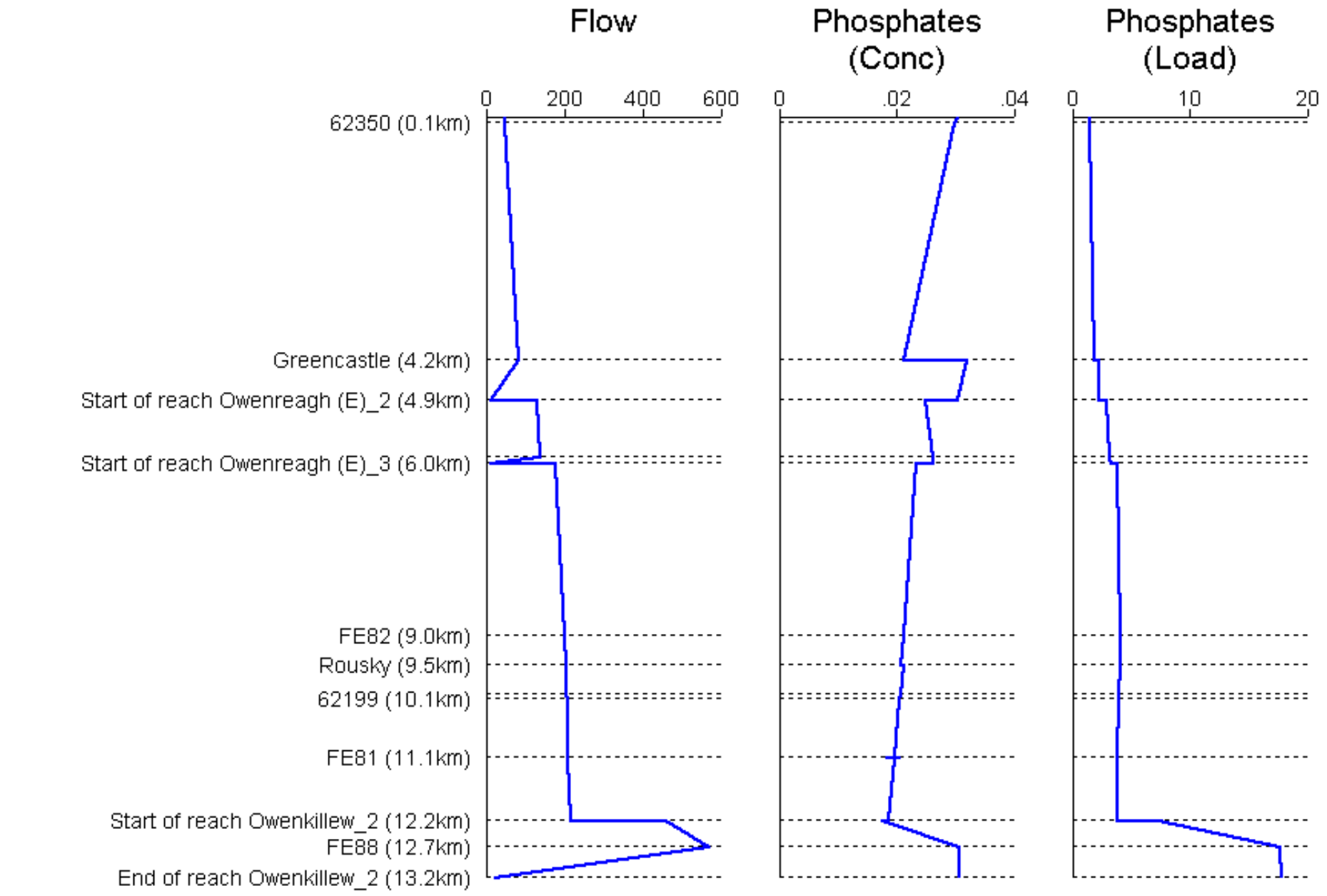
Pilot Model 2 - Upstream of Strabane STW



KEY: Mean values Quality targets Observed values

SIMCAT RESULTS
Date: 18/03/2008

Pilot Model 2 - Upstream of Strabane STW



KEY: Mean values ----- Quality targets + Observed values

Typical SIMCAT Applications

- Setting emission standards to achieve river quality standards
- Predicting the impact of pollution control policies
- Control strategies for diffuse pollution
- Effects of change in pattern of polluting inputs
- Understanding the cause of water quality problems
- Improved monitoring strategies

Advantage of SIMCAT

- Practical, cost-effective tool for routine use
- Proven software
- Makes best use of existing, often limited data
- Identifies critical areas where further data may be required
- Allows rapid assessment of management options
- Readily transferable to other catchments