



Real-time-monitoring of nutrients and physico-chemical parameters for detection and differentiation of impacts in small and middle scale catchments

Angelika Meyer

Saarland University

Institute for Inorganic and Analytical Chemistry

Saarbruecken, Germany





WFD: Point ↔ Diffuse Pollution

Article 10

The combined approach for point and diffuse sources

ANNEX II

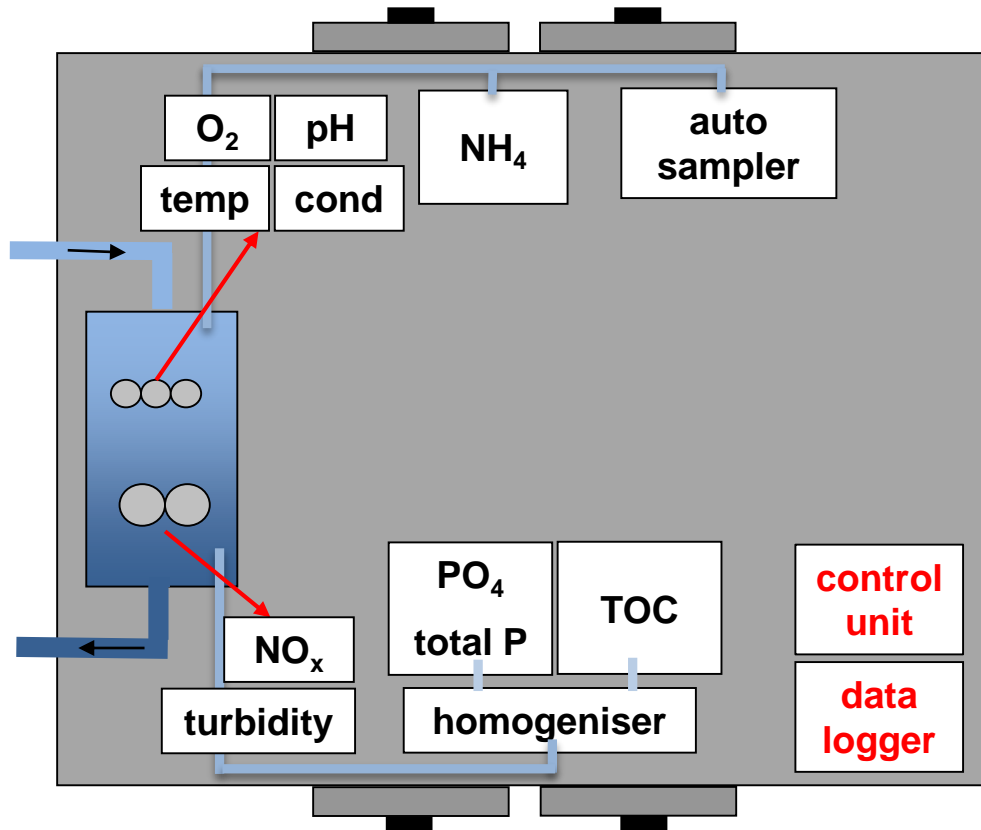
1 SURFACE WATERS

1.4. Identification of Pressures

Estimation and identification of significant diffuse source pollution, in particular by substances listed in Annex VIII, from urban, industrial, agricultural and other installations and activities; based, *inter alia*, on information gathered under:

2001 – 2004: LIFE ENVD/D/000337

Remotely controlled monitoring of eutrophication substances
from diffuse sources in the region SAAR-LOR-LUX (Eutroph Monitor)



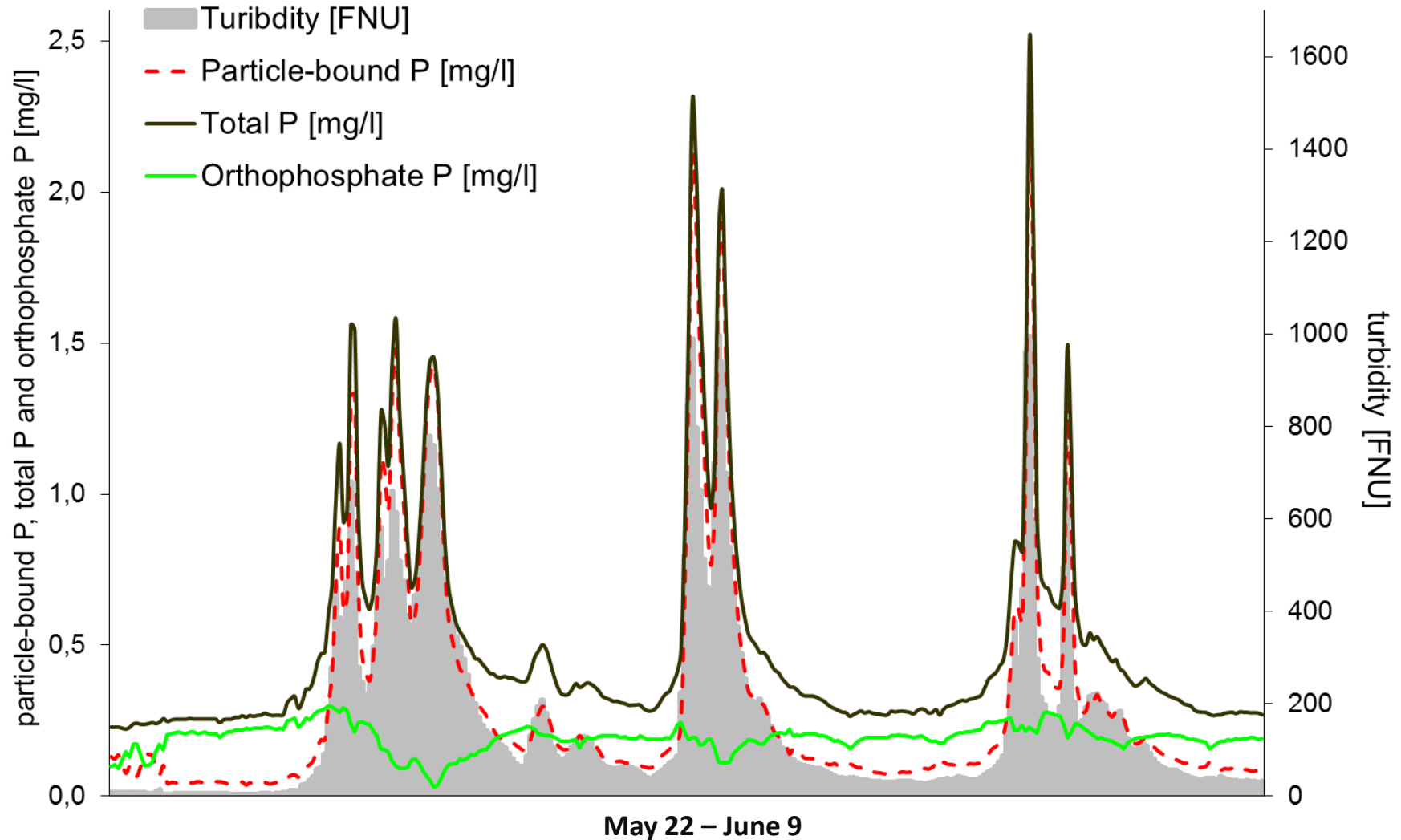
- sample basin continuously filled by a submerged pump in the river
- in situ measurement of temperature, oxygen, conductivity, pH-value, nitrate and turbidity
- sample primed by analysers for ammonia, phosphorus and TOC
- control unit for information about water level in the basin, pump status...
- data logger for storage of all gathered data and data transfer via GSM

modular designed system → adaptation to different investigation issues

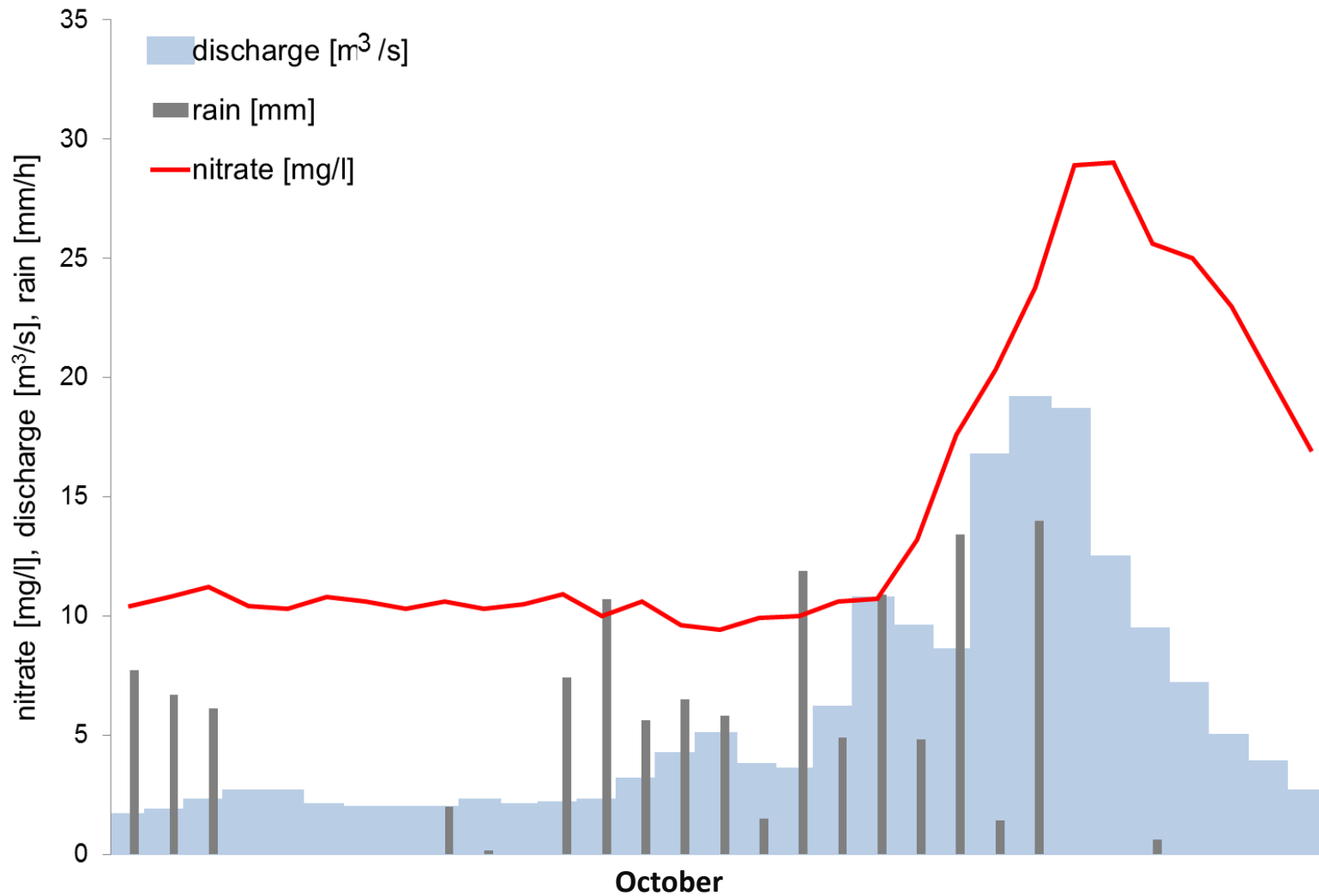


Interpretation of the data collected (average per hour) considering

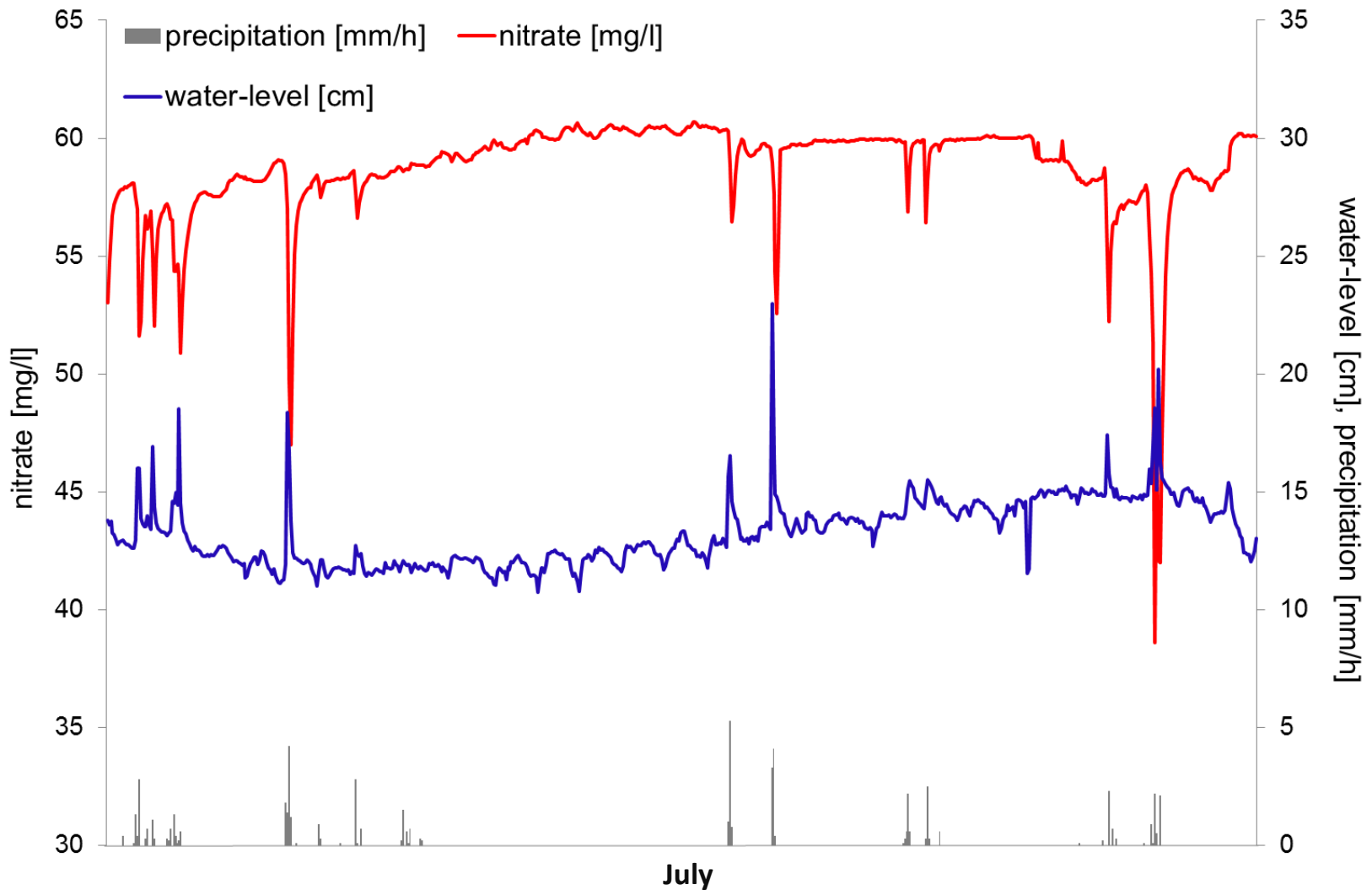
- **hydrologic information (discharges, water levels)**
- **weather conditions (precipitation, temperature, insolation)**
- **geologic and lithologic conditions**
- **polluters (domestic / industrial wastewater...)**
- **land use**



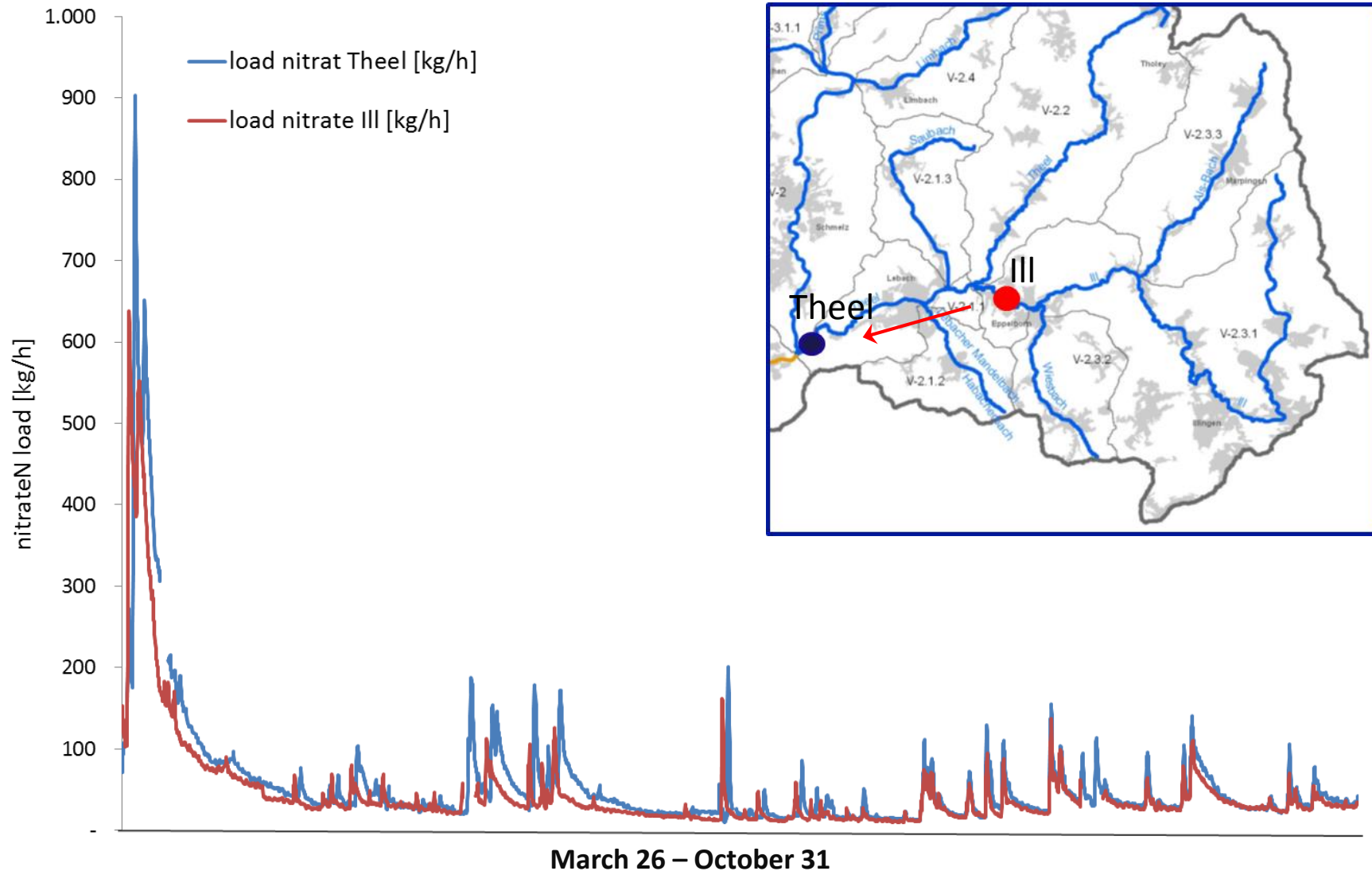
Impacts by surface runoff: erosion of P



Impacts via interflow: NO_3 : time-lag of several days



Impacts via basic flow (groundwater): NO_3



Estimation of pollution's origin regarding loads



Online measurements of these parameters and their interpretation allows to:

- **detect and differentiate diffuse and point source pollution**
- **differentiate between impacts via basic flow, surface runoff and interflow**
- **compare to thresholds / environmental quality standards**
- **know about geological / “natural” background**
- **calculate loads and emission amounts for short time intervals**
- **calibrate models very exactly**
- **measure the duration and effect of impact events (e.g. oxygen deficits)**
- **estimate the sensitivity of the system to changes**
- **....**



Thank you!

Angelika Meyer

ameyer@mx.uni-saarland.de

www.gewaesser-monitoring.de

