

Water Quality Laboratory at NIVA

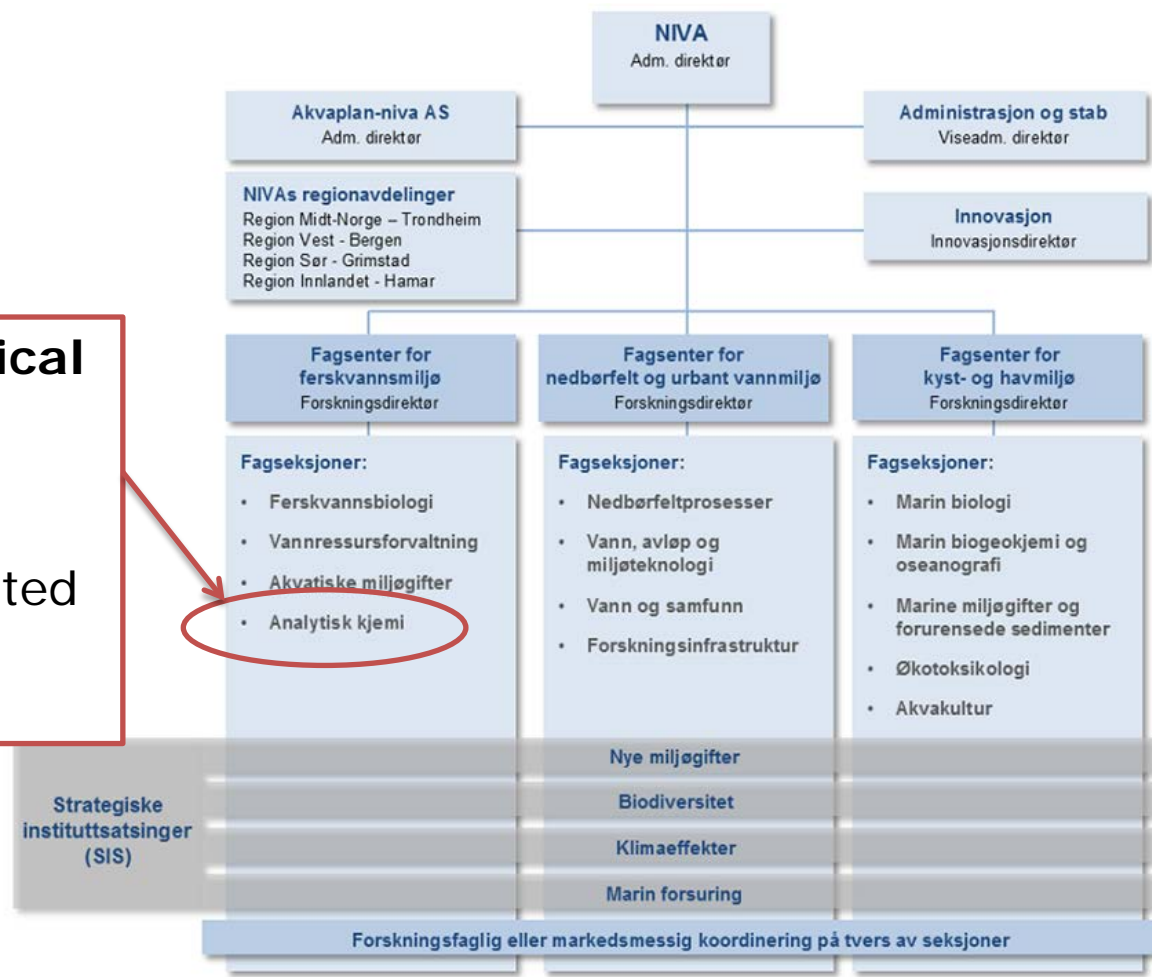
Overview

- NIVA's Organisation
- Instruments/Equipment
- Typical projects
- Quality system
- Training

NIVA's Organisation

Section for Analytical Chemistry

- Research lab
- Routine analyses, ISO 17025 accredited
- Accredited subcontractors



Laboratory instruments/equipment

- Main instruments for waterquality parameters:
 - pH, conductivity and alkalinity robot
 - Manually spectrophotometric methodes for different Colourimetric measurements.
 - Turbidimeter
 - Ionchromatograph for analysis of major cations and anions (Ca, Mg, Na, K, NH₄, Cl, SO₄, NO₃ and F)
 - CFA analysers for nutrients (PO₄, NO₃+NO₂, NH₄, SiO₂, Total-N, Total-P, TOC)
 - ICP-MS and ICP-OES for all kind of metal analysis. It`s also possible to connect front end systems such as HPLC for speciation of metals.

Typical Projects

- Monitoring of lakes, rivers and coastal waters
- Environmental survey (harbours, industrial wastewater monitoring)
- Screening for new environmental pollutants
- Biota and sediment analysis usually done by NIVA is now sent to subcontractors
- All organic analysis in both water, biota and sediments is sent to subcontractors

Quality System ISO 17025:2005

“General requirements for the competence of testing and calibration laboratories”

- Internationally accepted standard for laboratory quality systems
- Compatible with ISO 9001:2008
 (“Quality management systems Requirements”)
- Keywords Customer focus
Competence
Traceability
Improvement

Quality system requirements, ISO 17025 (1)

- Laboratory organisation
 - Quality leader and technical leaders.
 - Free access to parent organisation.
- Formal management system
 - Quality manual
 - Quality policy and quality goals
- Annual management review
 - Suitability of management system
- Formal improvement system
 - Deviation and complaints reporting/handling
 - Internal audit programme
 - External audit from accrediting body, Norwegian Accreditation

Quality system requirements, ISO 17025 (2)

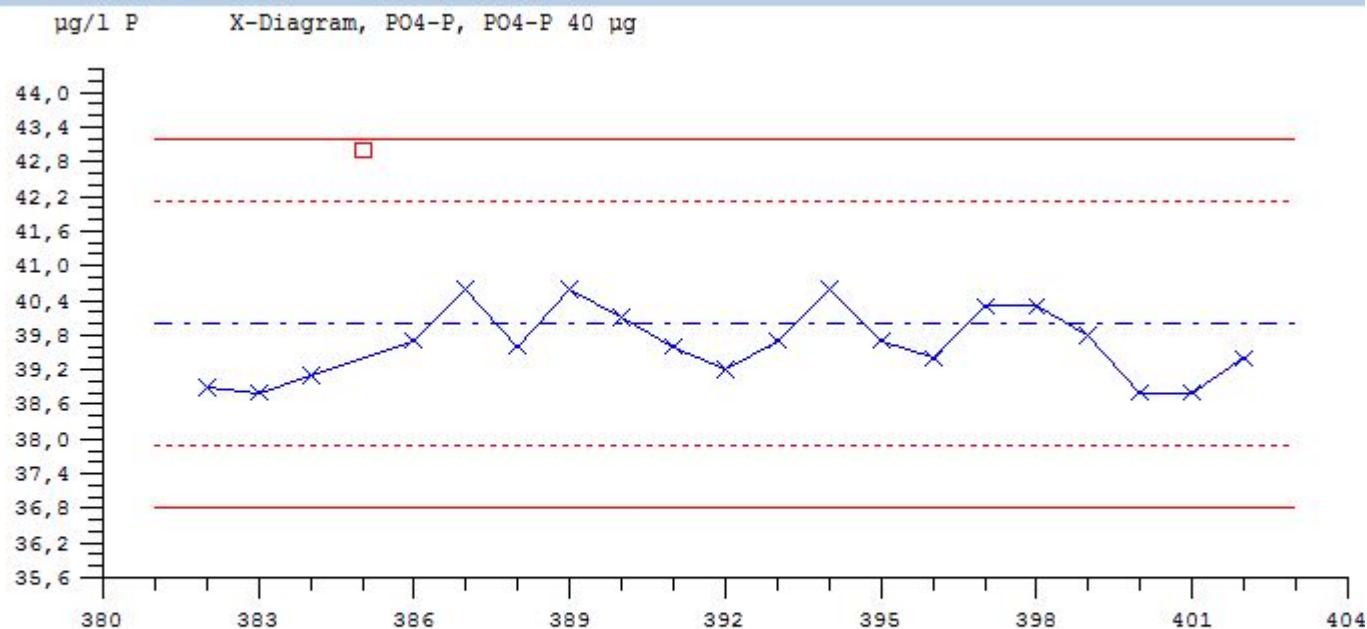
- Written documentation
 - Procedures
 - Analytical methods
 - Forms
- Document control
 - Approved documents
 - Version control
- Competence
 - Trained personnel
 - Maintenance of competence

Quality system requirements, ISO 17025 (3)

- *Documented* measurement traceability to SI (International System of Units)
 - Periodic calibration of equipment and instruments, incl. balances, pipettes, thermometers
 - Use of reference standards and materials
 - Use of standardised methods
 - Use of quality controls
 - Use of control charts
 - Participation in interlaboratory comparison or proficiency testing programmes
- Formal review and approval of results for reporting

Control Chart

X-Diagram, PO4-P, PO4-P 40 µg



Beregnet
 m: 39,65
 s: 0,61
 n: 20
 cv: 1,55%

Oppsatt
 m: 40,0
 s: 1,06
 b: 40,0
 cv: 2,65%

Grenser
 Alarm: 37,88 42,12
 Aksjon: 36,82 43,18

Training programme

- Approved training of accredited personnel
 - Quality manual
 - Improvement system
 - Equipment
 - Procedures
- Mandatory to update CV annually
- Document regular maintenance of competence
- List of approved personnel is being kept updated