



Pågående arbeid, utfordringer og erfaringer i kommuner med biostabilitet i ledningsnett:

Bergen Vann

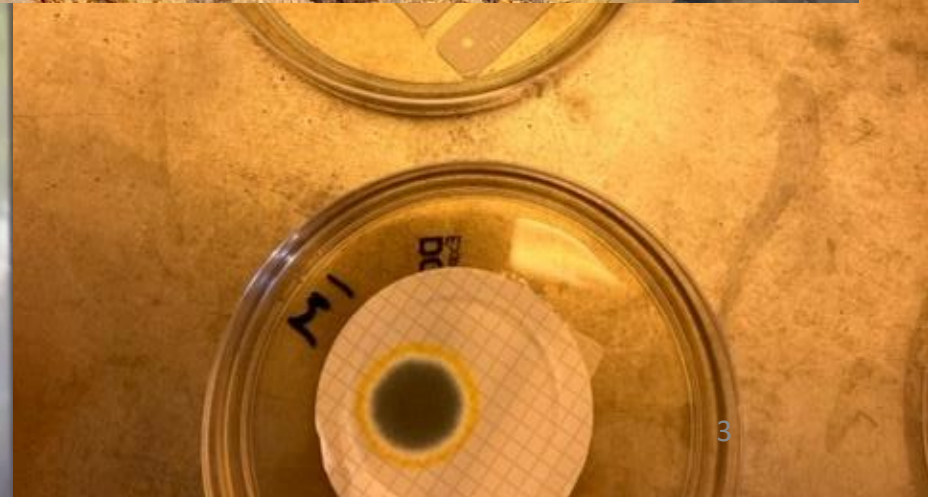
Urd Eriksen
Hege Hovland

FoU Mikrobiologisk vannkvalitet



Hva har vi lært?

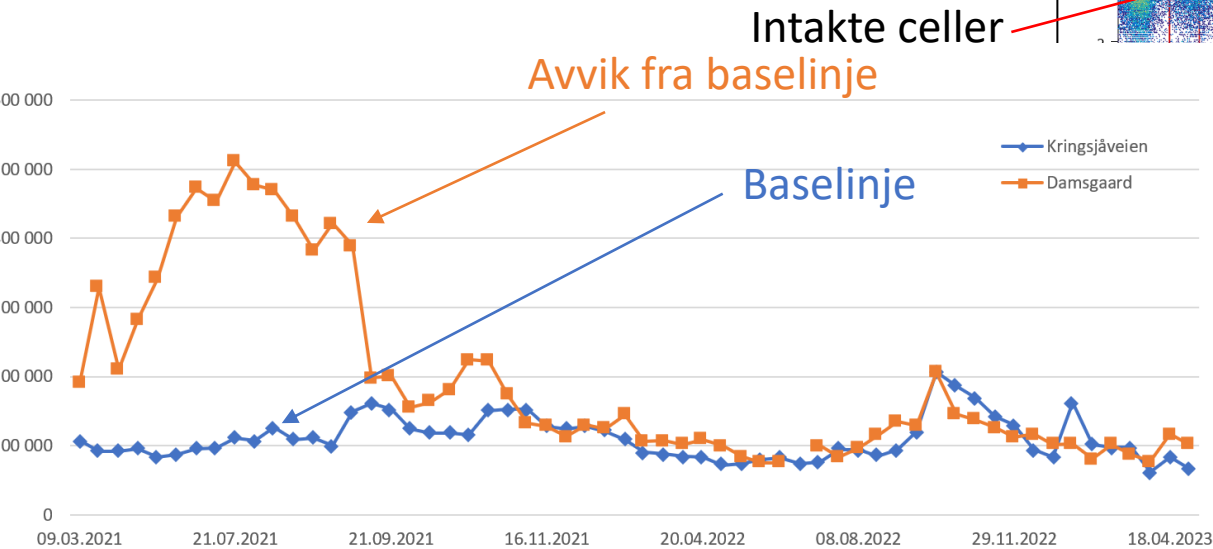
Drikkevann er ikke sterilt
Rent, trygt drikkevann inneholder
100 000 bakterieceller per milliliter



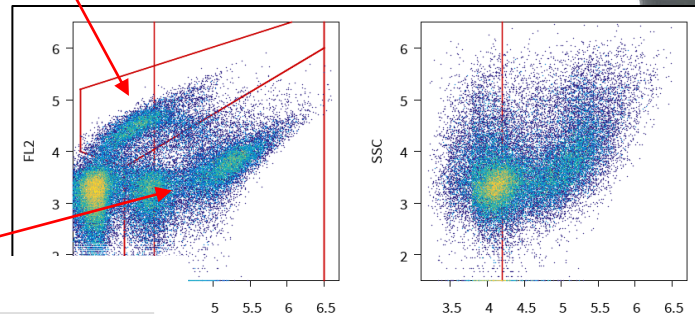
Behov for nye metoder

Flowcytometer – BactoSense

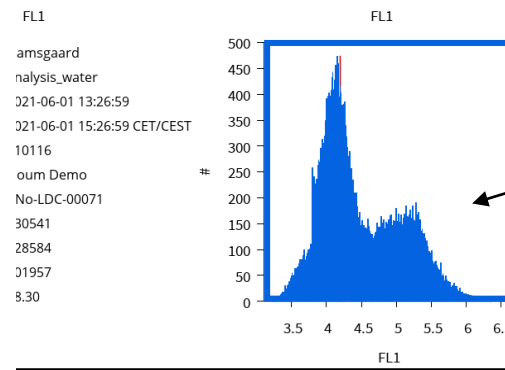
- Måler alle celler
- Mer informasjon enn kimtall



Ødelagte celler

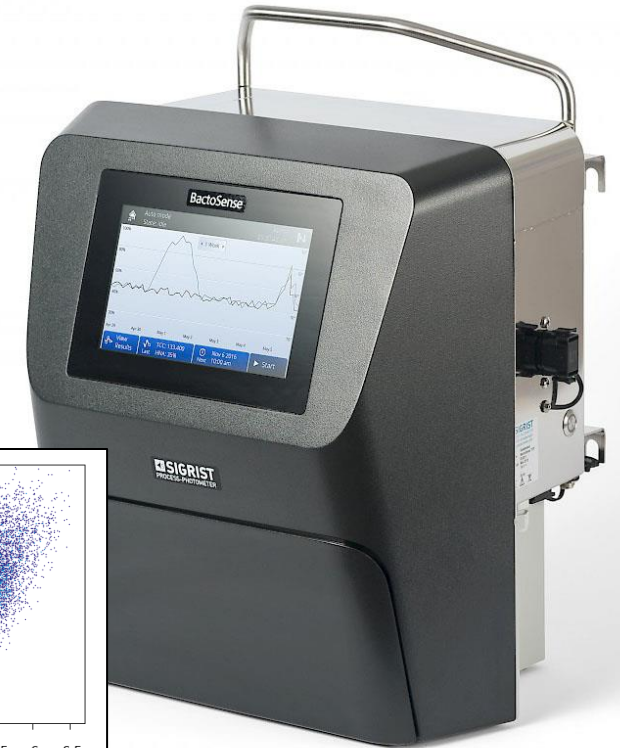


Intakte celler



Fingeravtrykk

Økende størrelse,
aktivitet, kompleksitet...

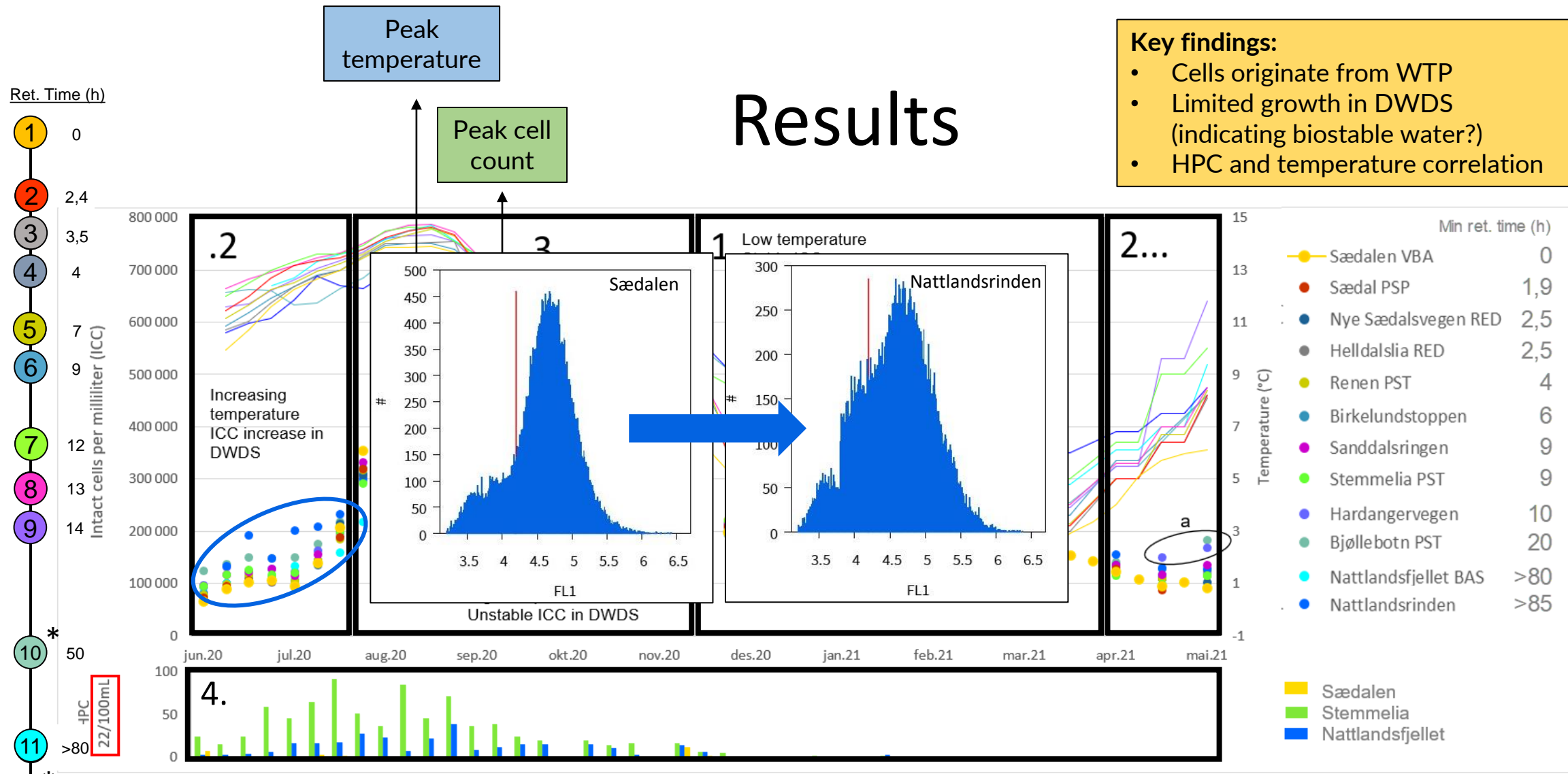


<https://www.houm.no/>

Results

Key findings:

- Cells originate from WTP
- Limited growth in DWDS (indicating biostable water?)
- HPC and temperature correlation

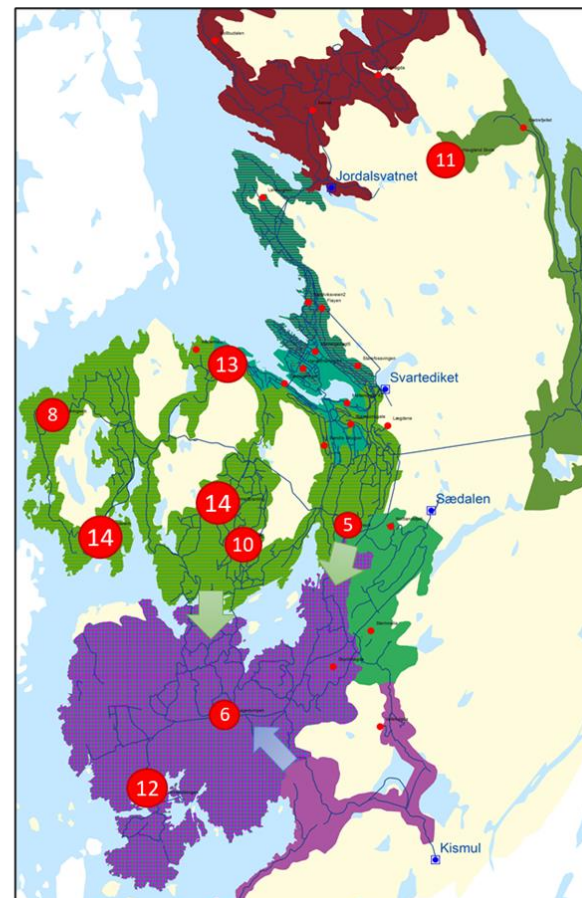
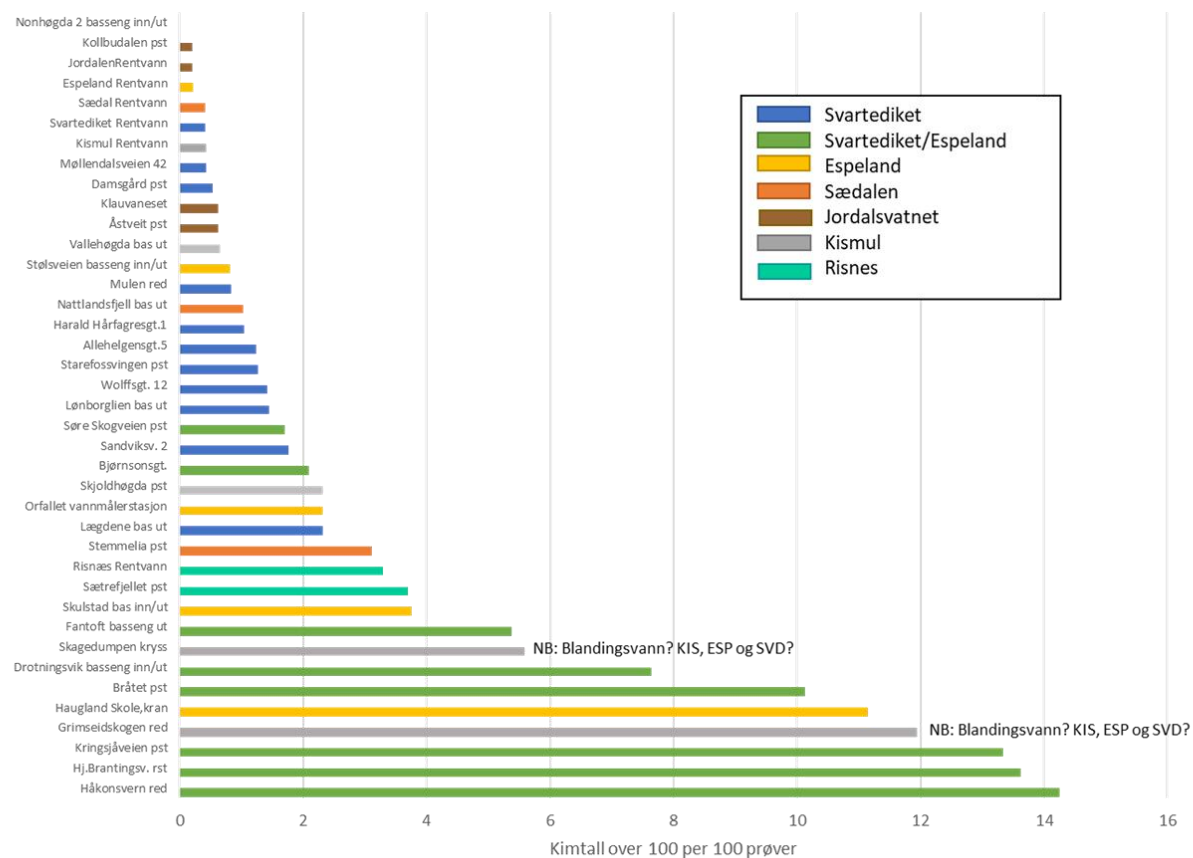


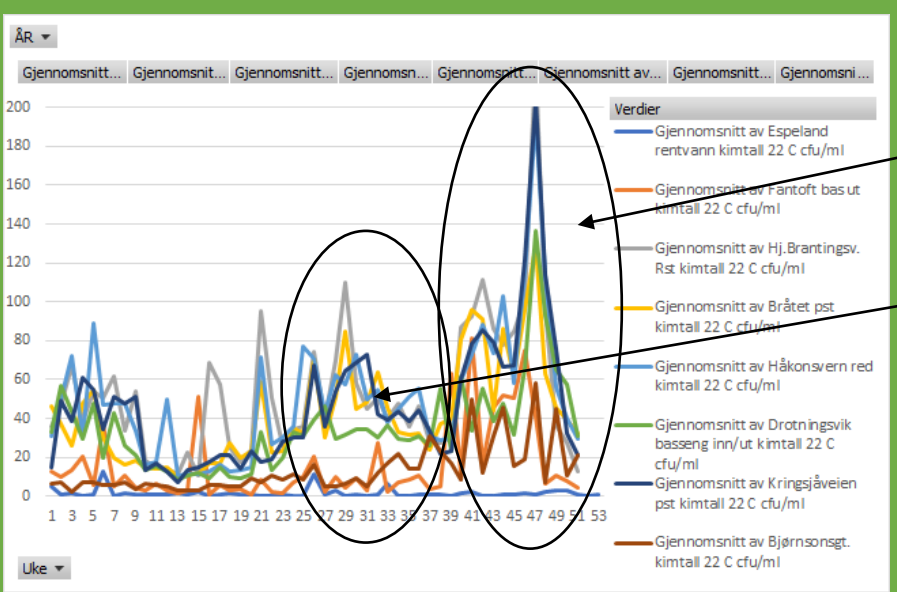
Water Safety Conference 2022
June 22 – 24, 2022, in Narvik, Norway



Case 2: Vest

Kimtall – prosent høye prøver (>100)

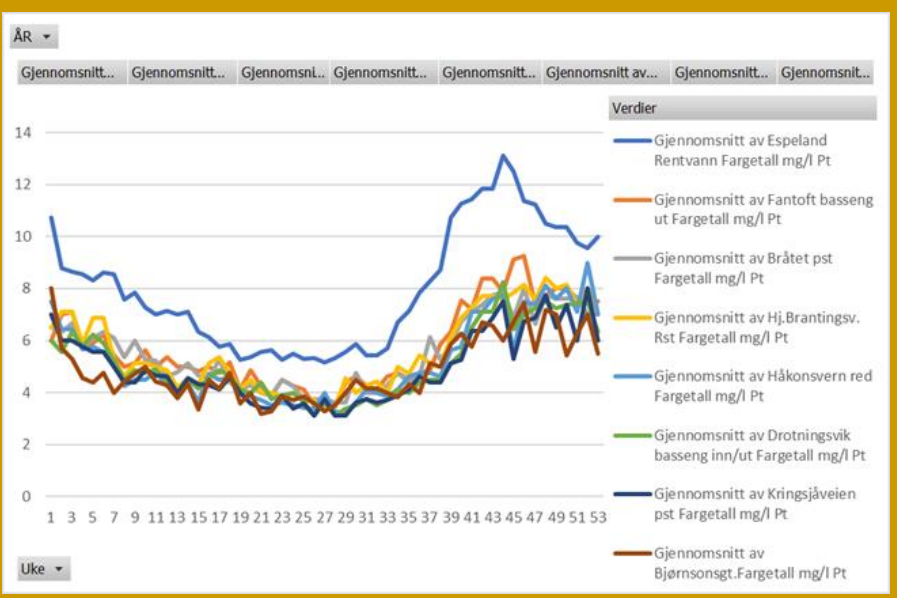
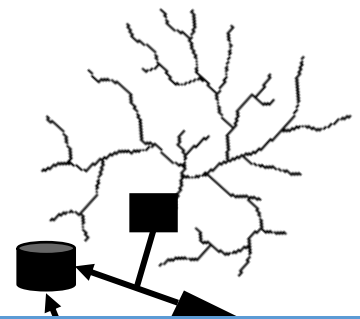




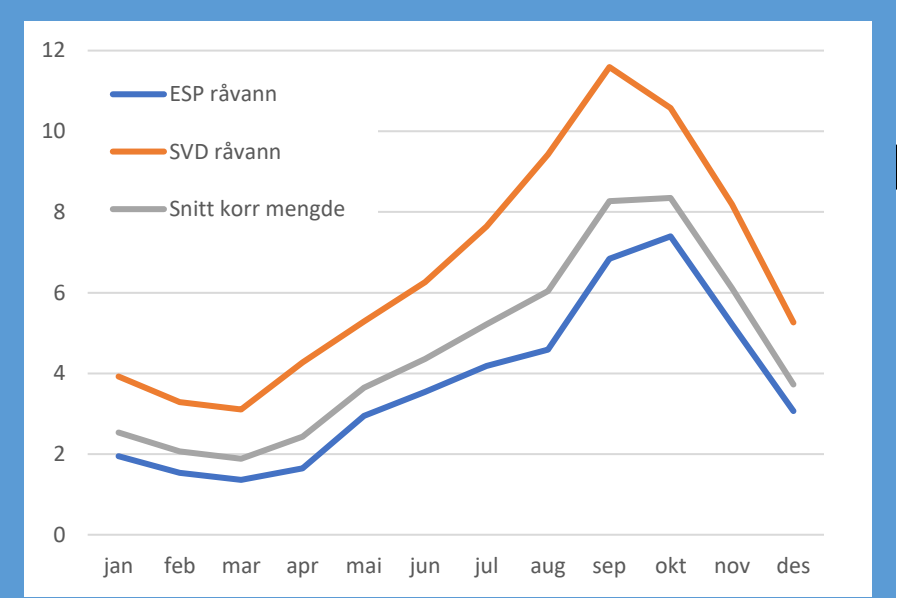
Kimtall - bakterievekst

Høsttopp – kan forklares med mat og temperatur

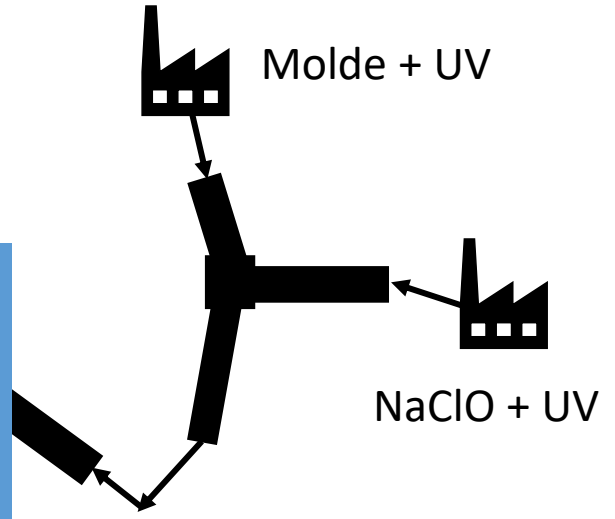
Sommertopp – kan forklares ikke forklares med mat, temperatur og oppholdstid. Oppstår etter et overføringsbasseng.



Fargetall – mat og næring



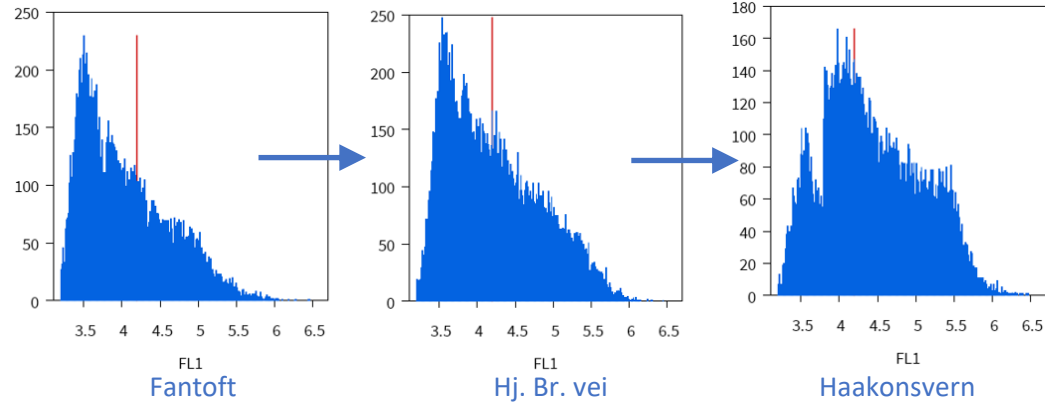
Vanntemperatur



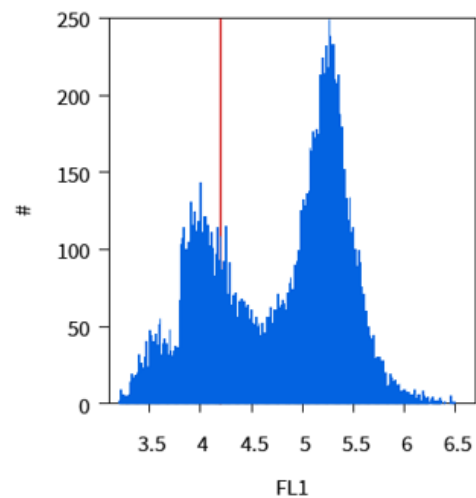
Læringspunkt

– økning i bakteriemengde og sammensetning

Økning i høynukleære celler



Et basseng med kjente svakheter skiller seg ut:



Jernreducerende (?) bakterier – tegn på innsig av grunnvann?



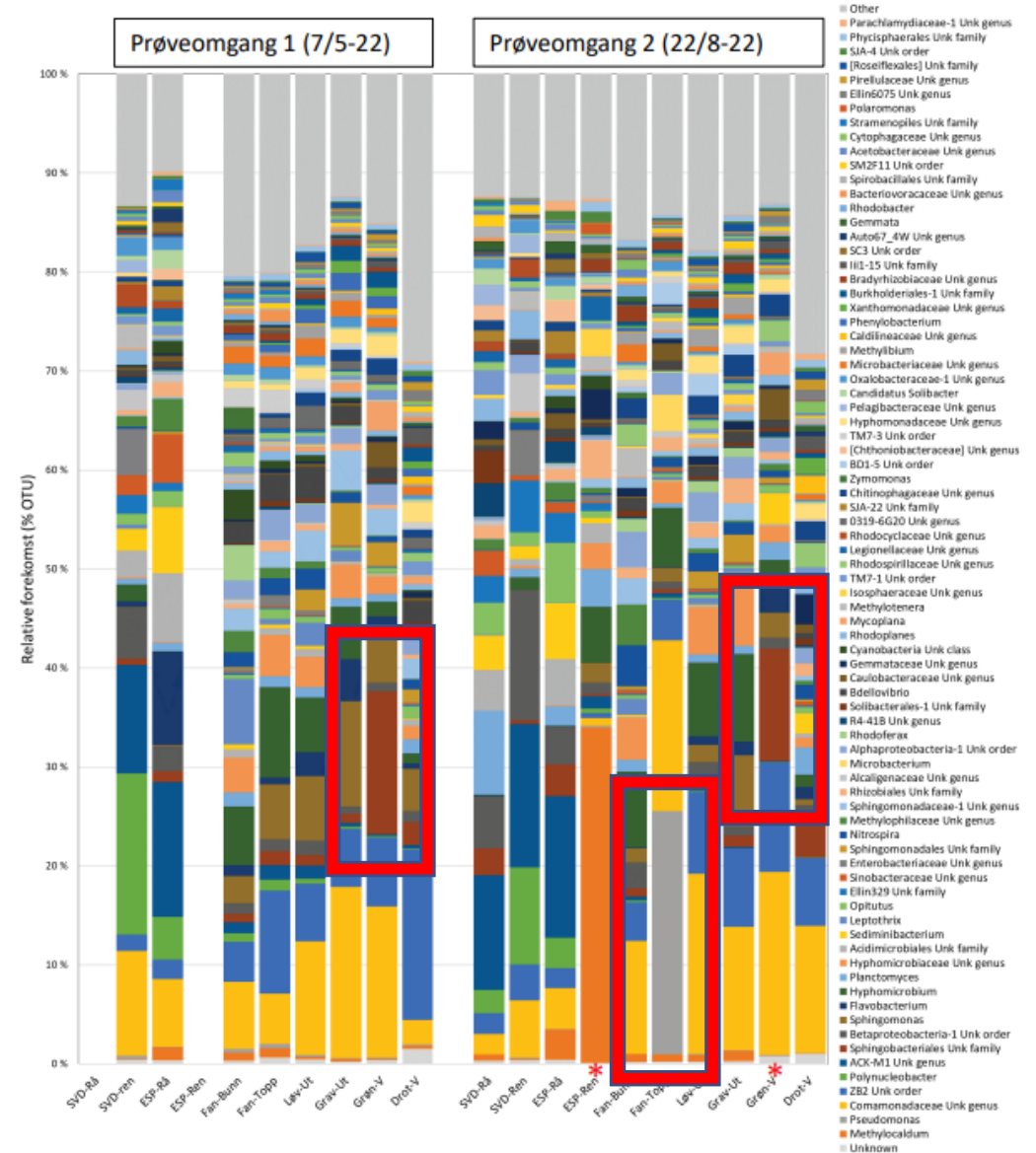
Læringspunkt

Hovedsakelig vanlige jord- og vannbakterier

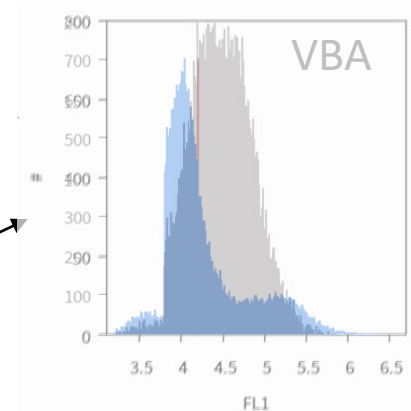
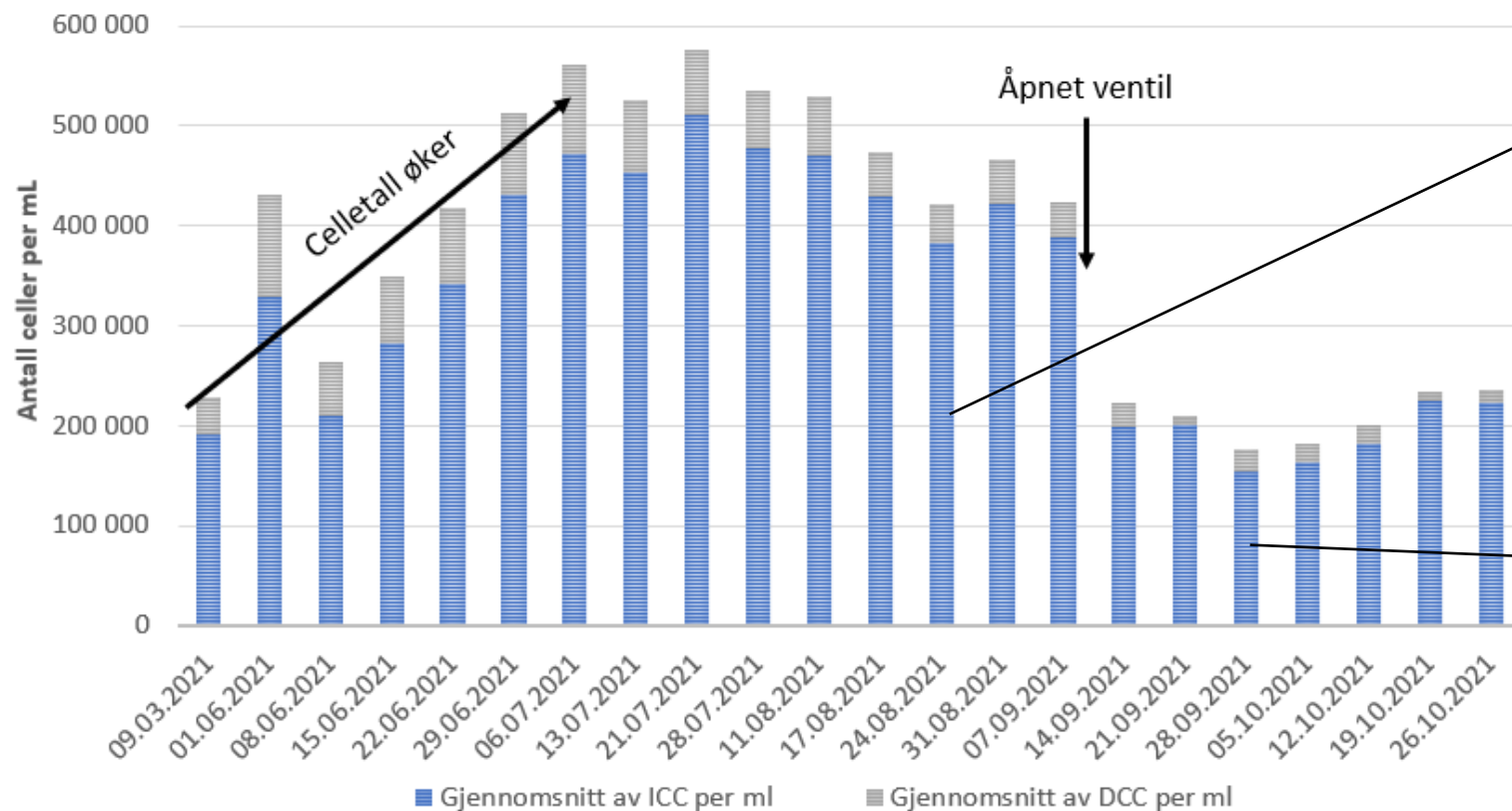
Mangfoldig bakterieflora – positivt

Noen prøvepunkt skiller seg ut:

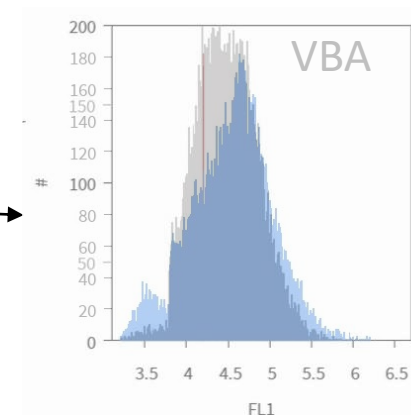
- Fantoft overflate:
Dominert av *Pseudomonas* – mest sannsynlig innlekking
- Grøntua: *Sphingobacteriales*
Tilførsel i hele bassenget pga. innlekking



Læringspunkt – stillestående vann



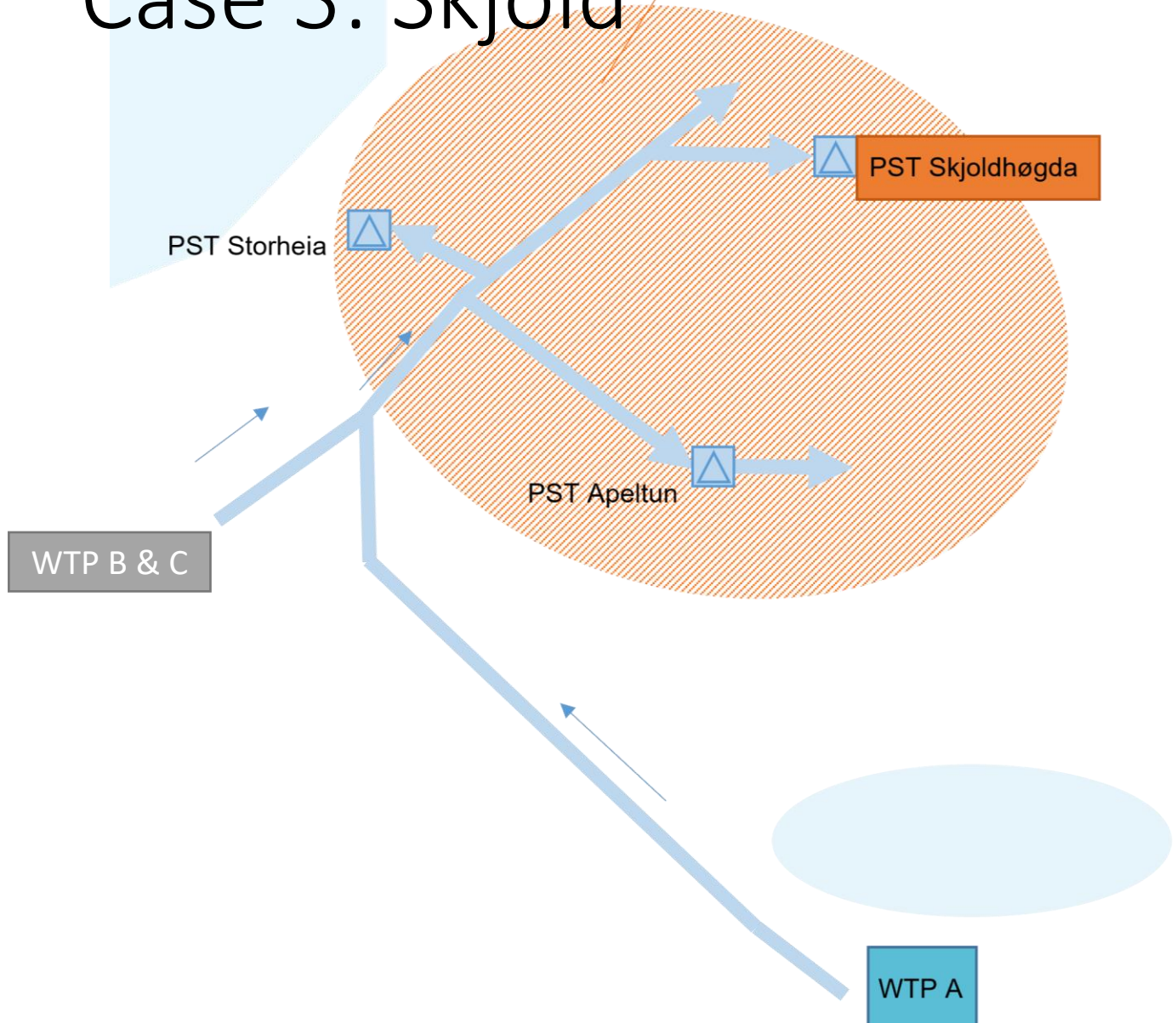
Stillestående vann



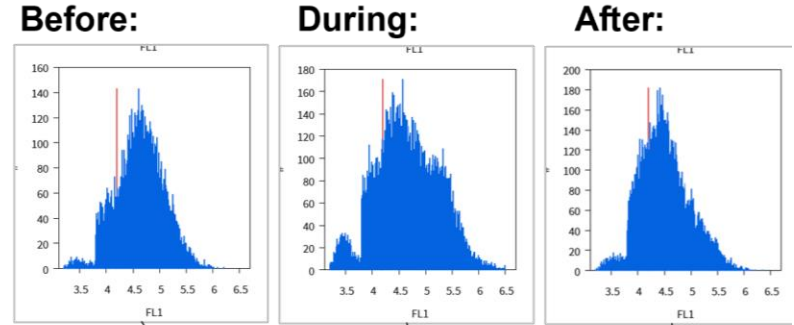
«Friskt vann»

Case 3: Skjold

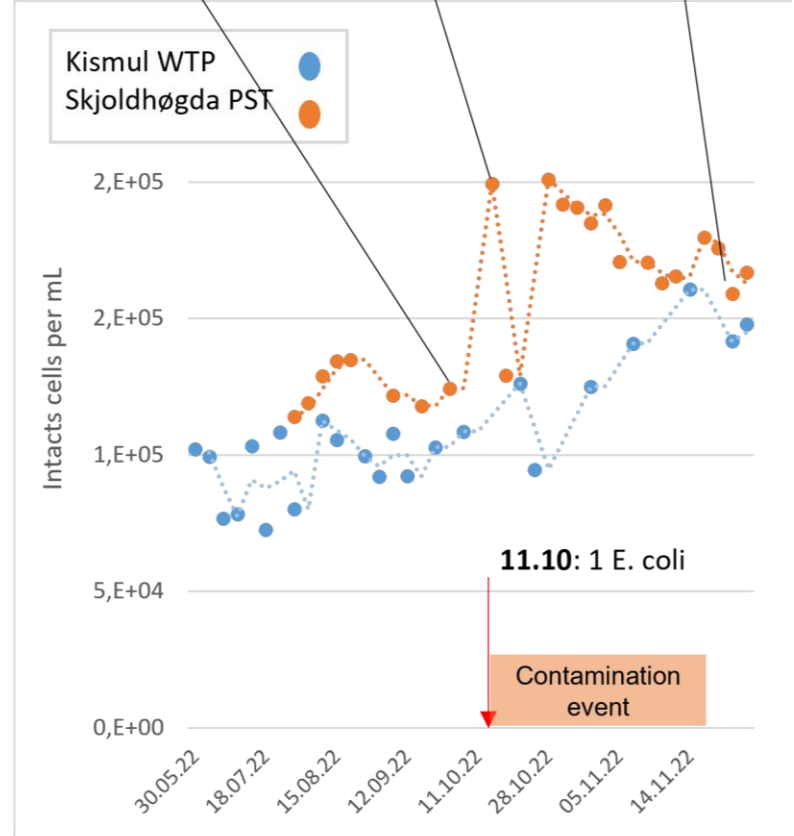
Area with increased cell counts and sporadic finds of fecal indicators



Fingerprints



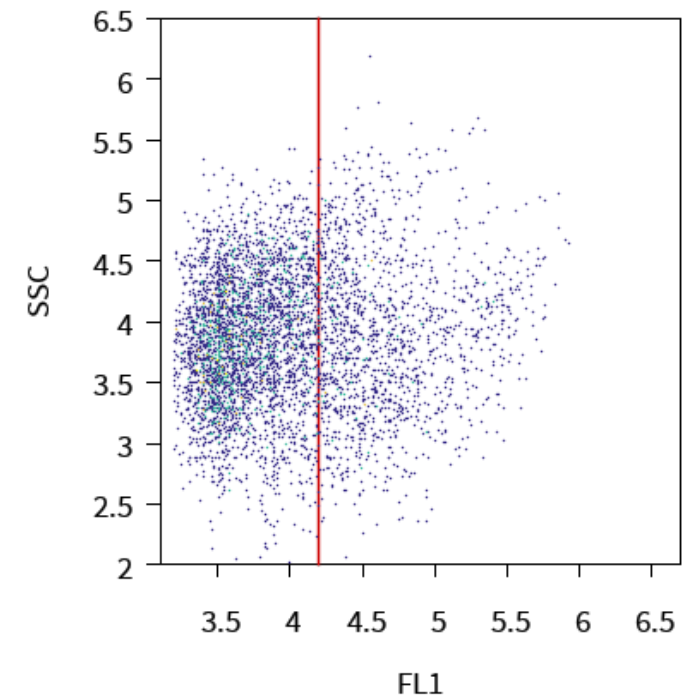
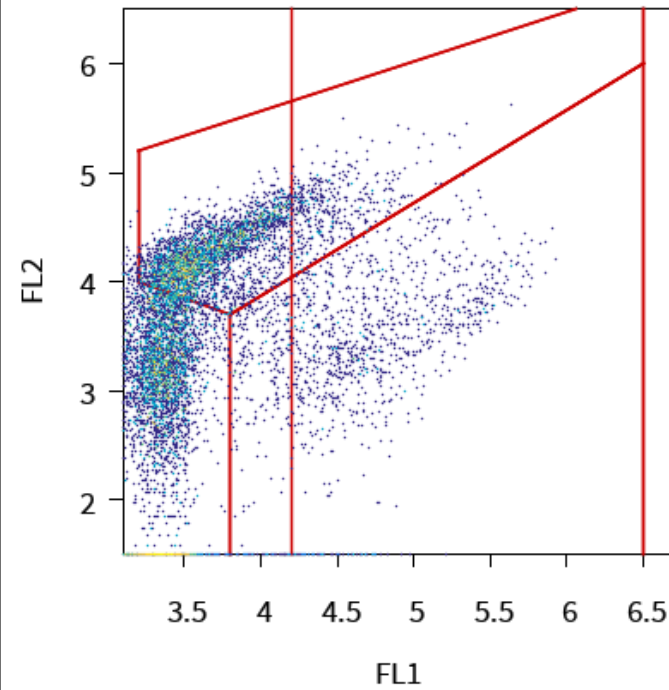
Baselines



Læringspunkter

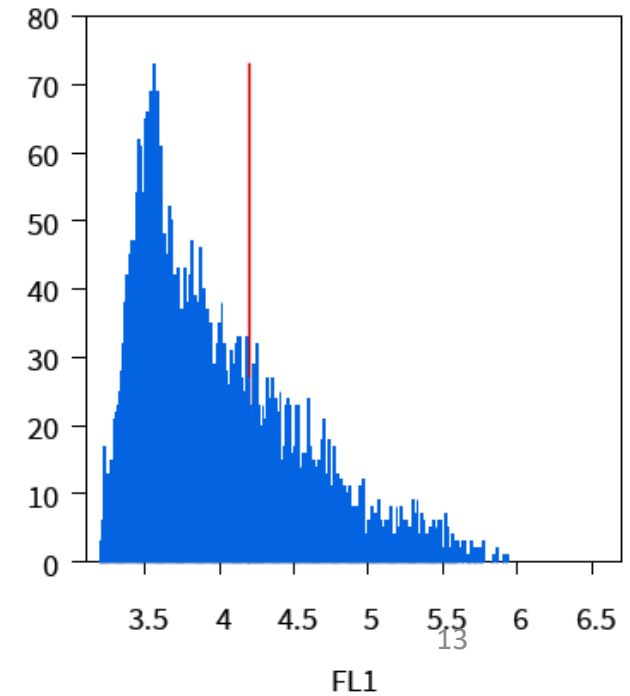


Biofi



Etter klor

Instrument SN:	910116
Cartridge fill SN:	BNO-LDC-00322
TCC [/ml]:	54460
ICC [/ml]:	14520
DCC [/ml]:	39940
HNAP [%]:	78.24



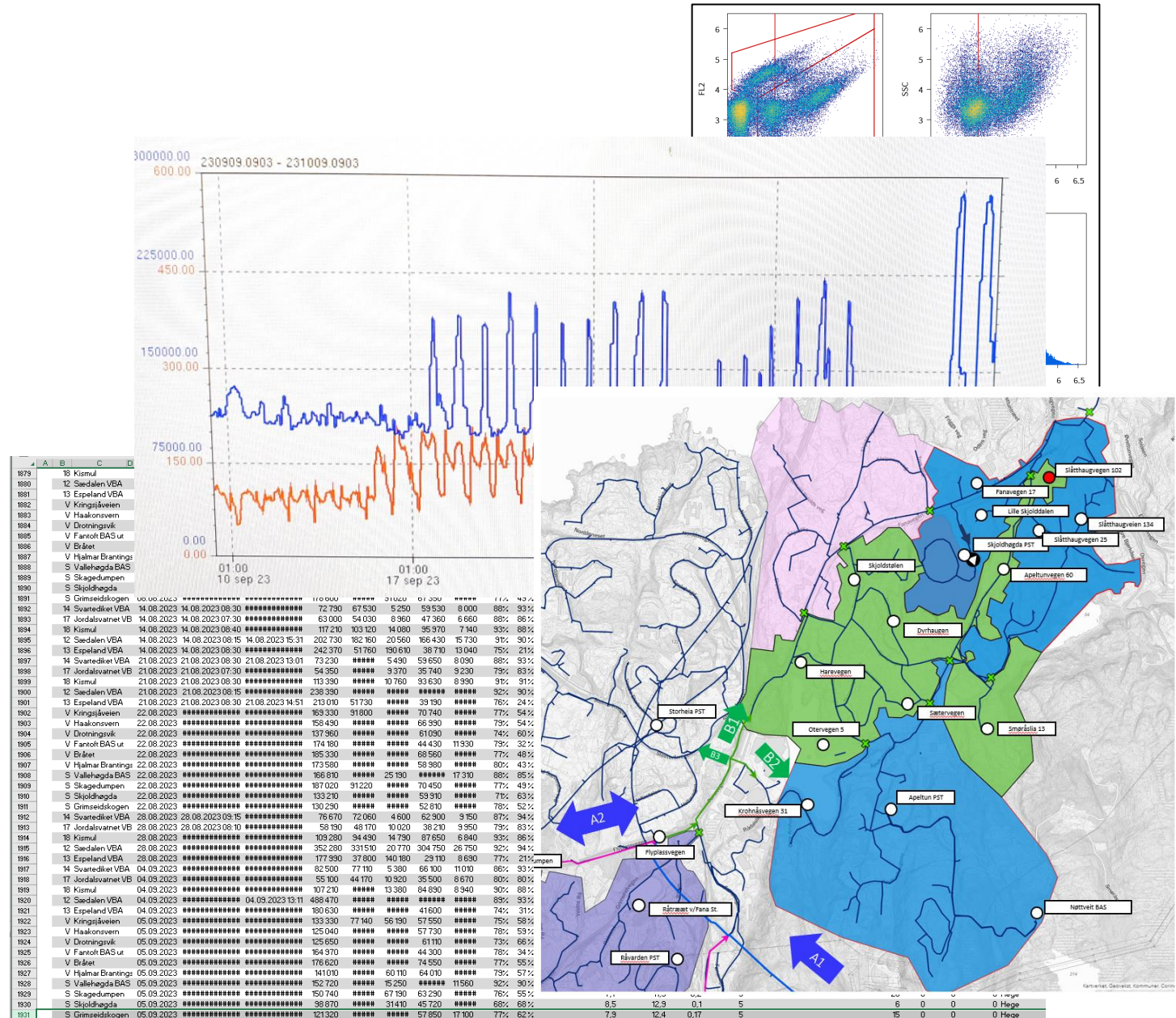
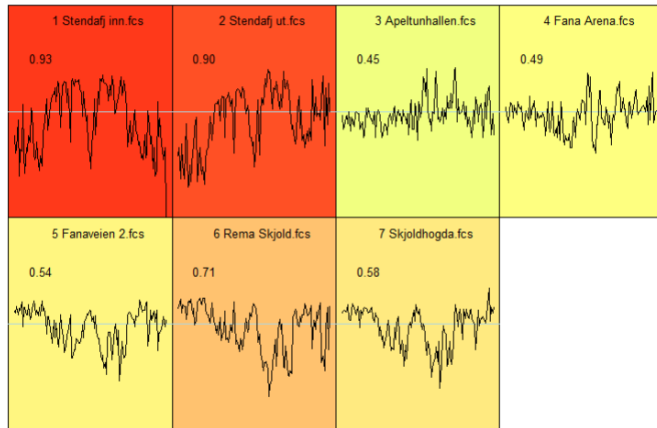
Utfordringer

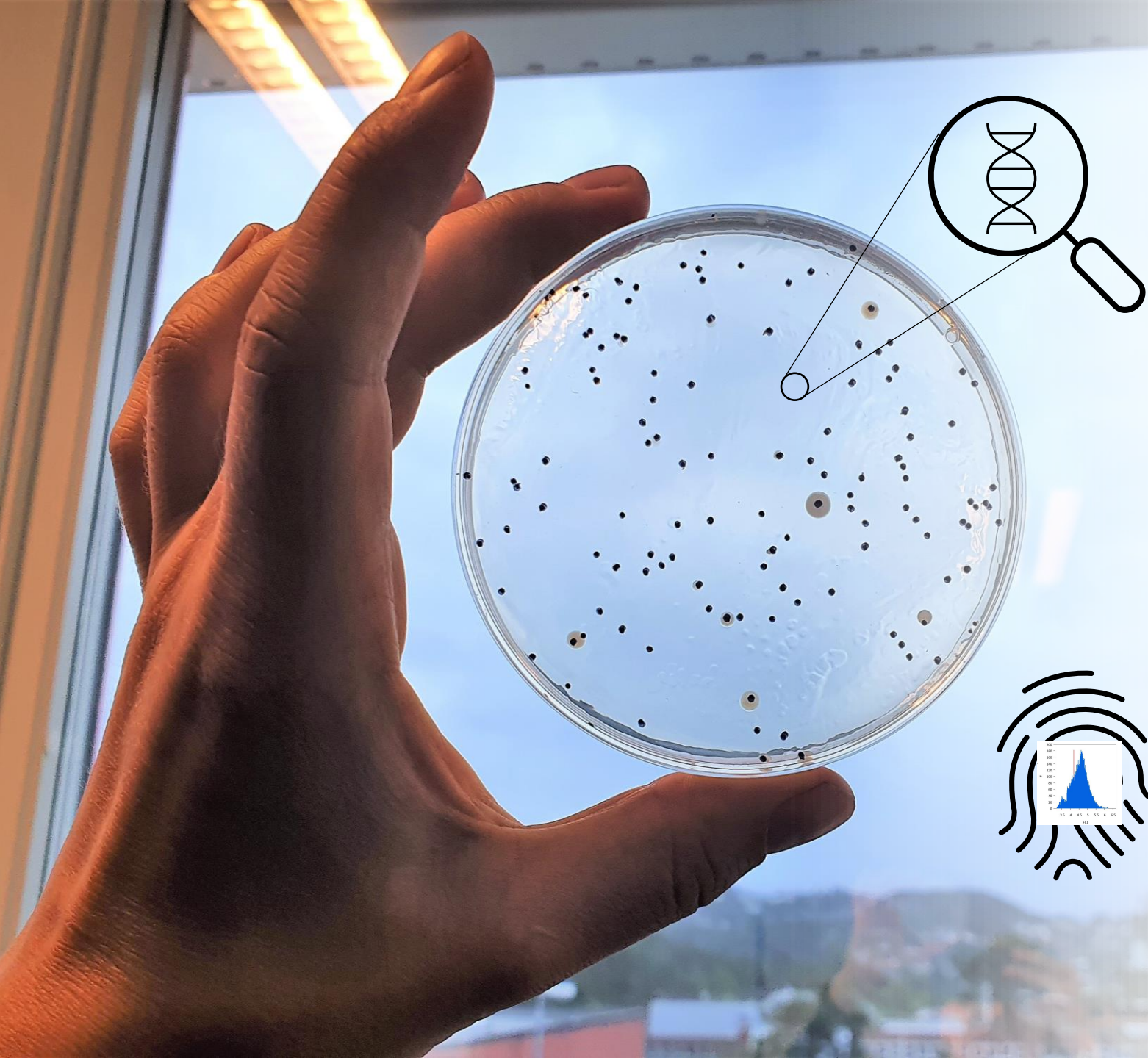
DATA

Mye data, komplekse data, online data, geografisk utbredelse, kobling av ulike typer data, tolke data, nyttgjøre data

Fingerprint Deviation Plot

method = sd
vertical scale factor = 3.0



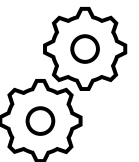


Veien videre

DNA-sekvensering:

- FHI Bergsprengte drikkevannsmagasin
(fra kilde til kran)
- FHI Drikkvannets mikrobiom
(fra kjelde til kran i område med gjentakende funn av fekale indikatorer)

Trykklogging



Konklusjon og veien videre



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