Merdmiljø

Lars H. Stien, Havforskningsinstituttet

CREATE

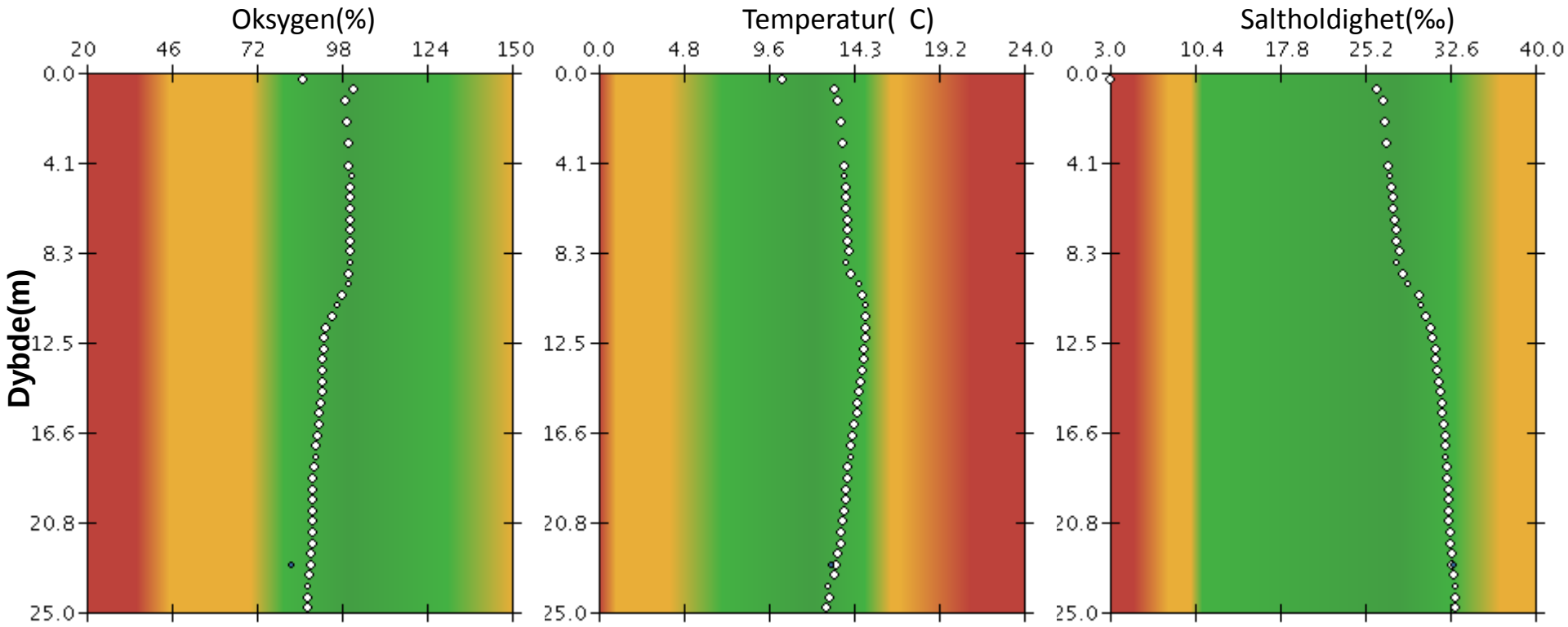
Centre for research-based innovation in aquaculture technology

Merdmiljøkonferanse, 4 november 2010, Clarion hotel, Flesland, Bergen

Tre hovedparametre

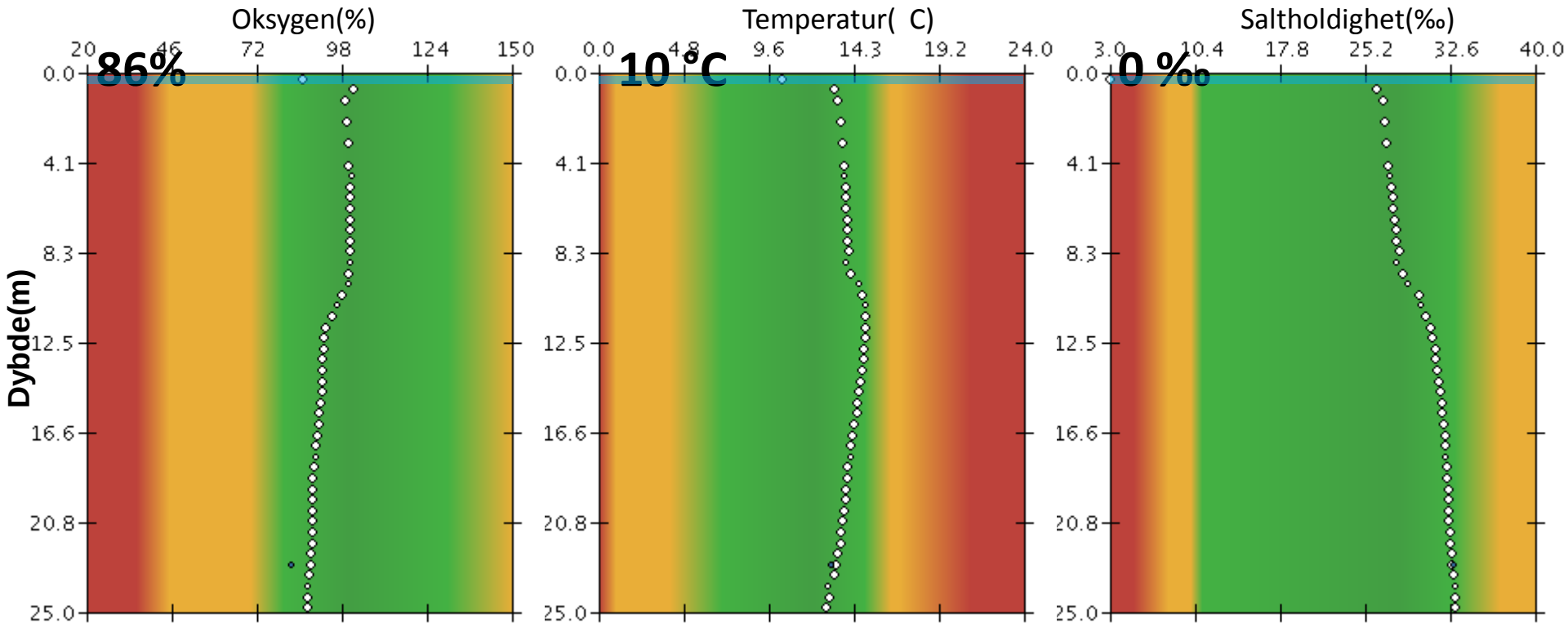
- Oksygen
- Temperatur
- Saltholdighet
  - Som ofte henger sammen med hverandre

Tre hovedparametre



Kl 00:00, 21 oktober 2010

Fisken opplever tre-fire miljøforhold i dette tilfellet



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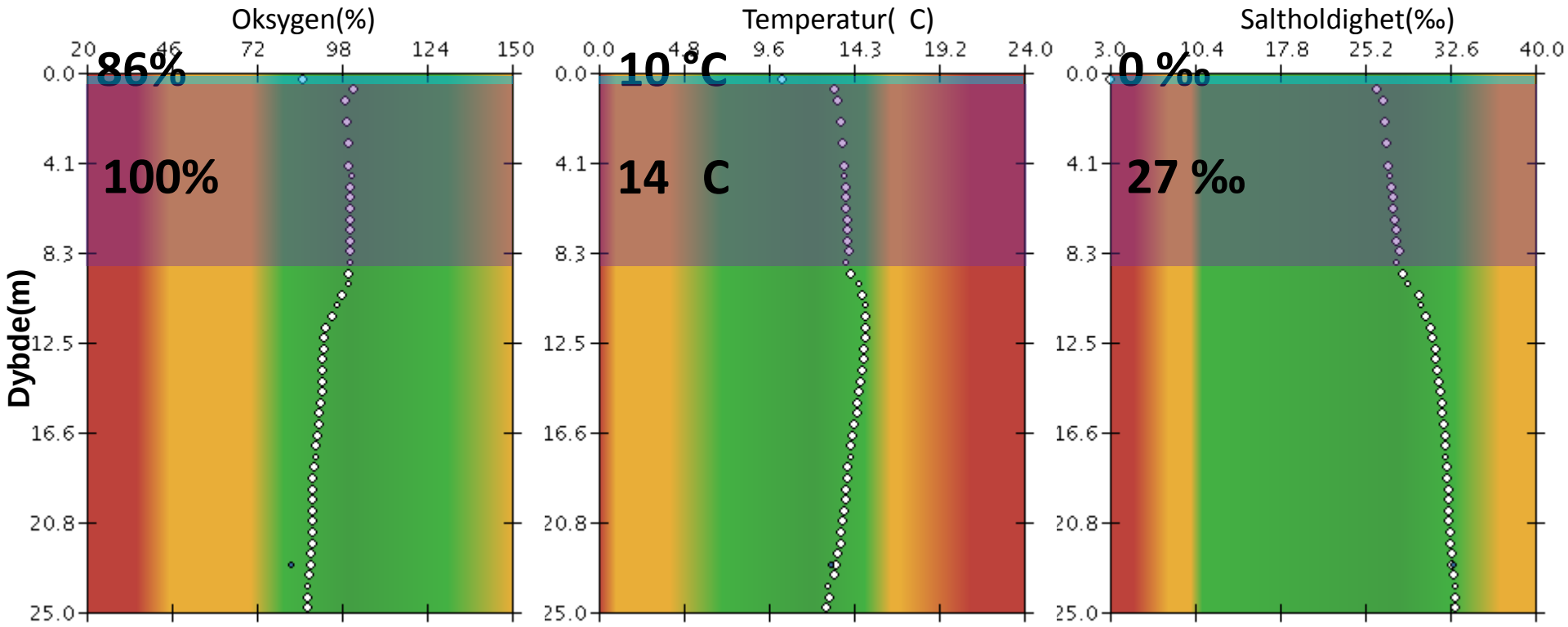

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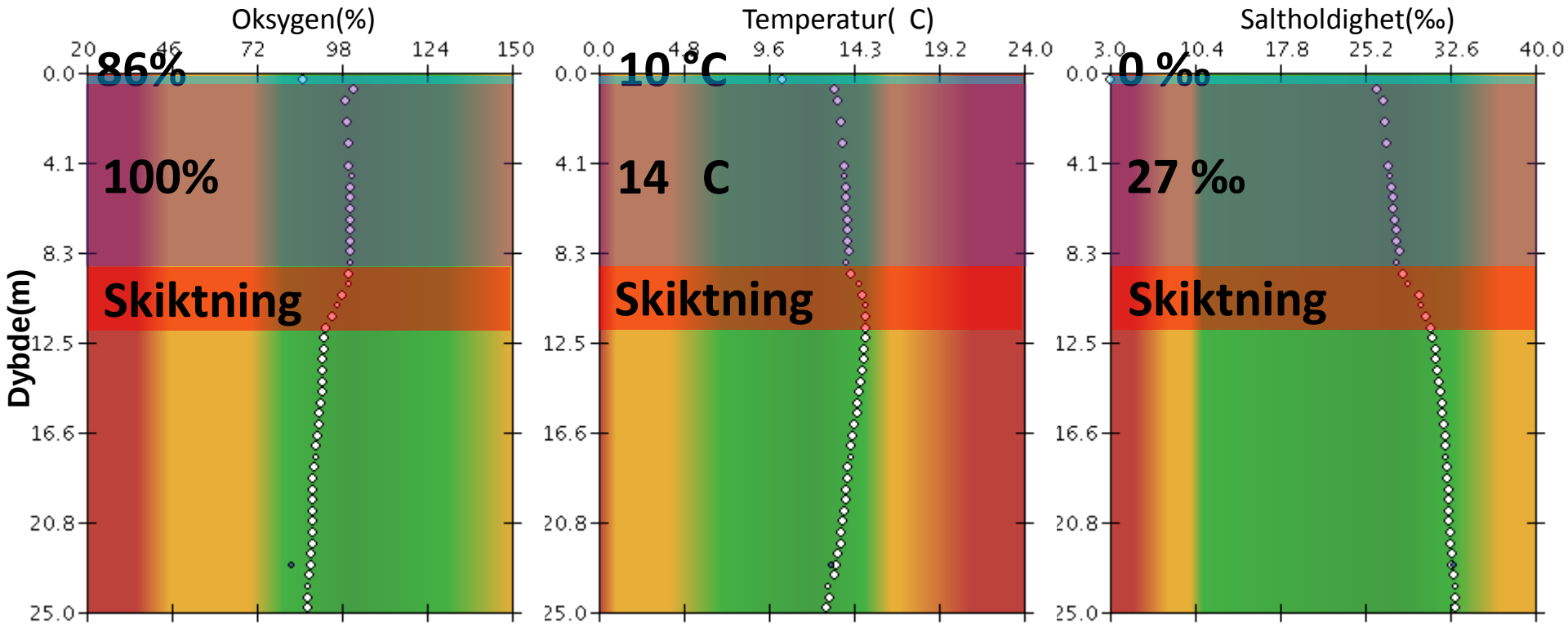

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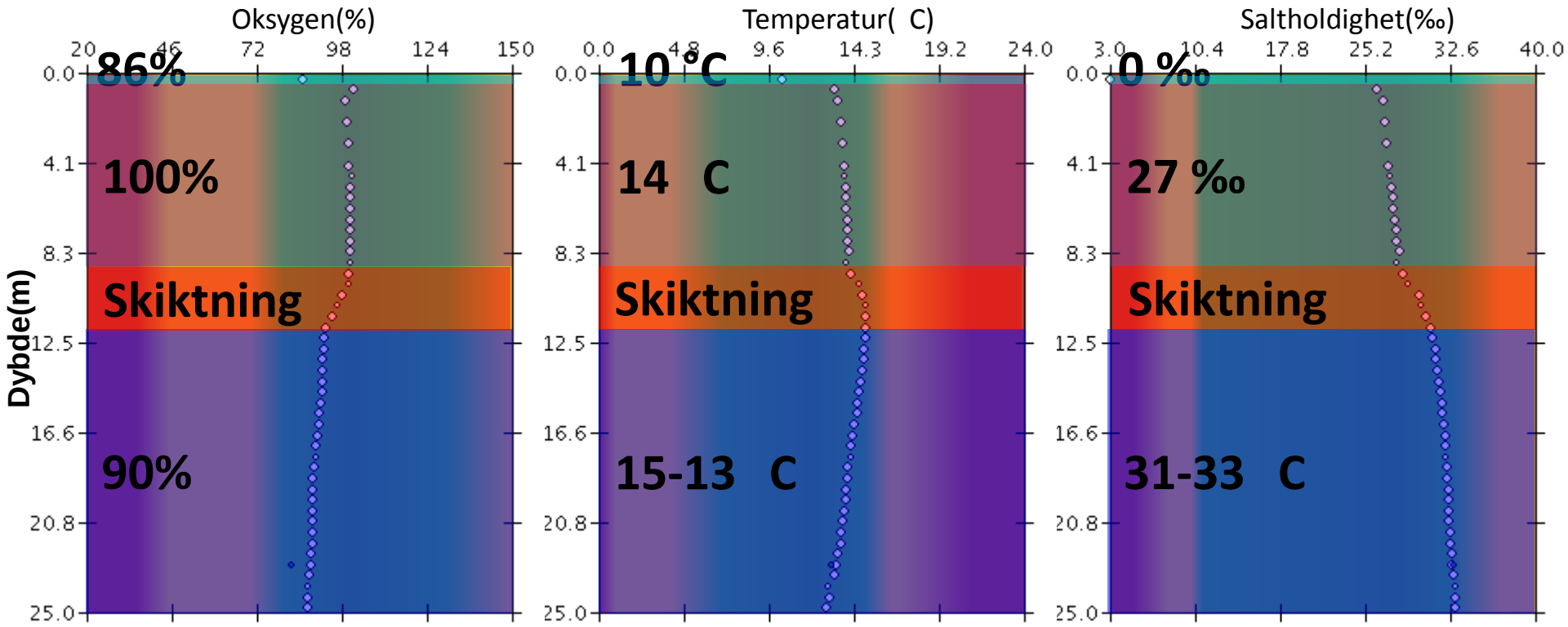

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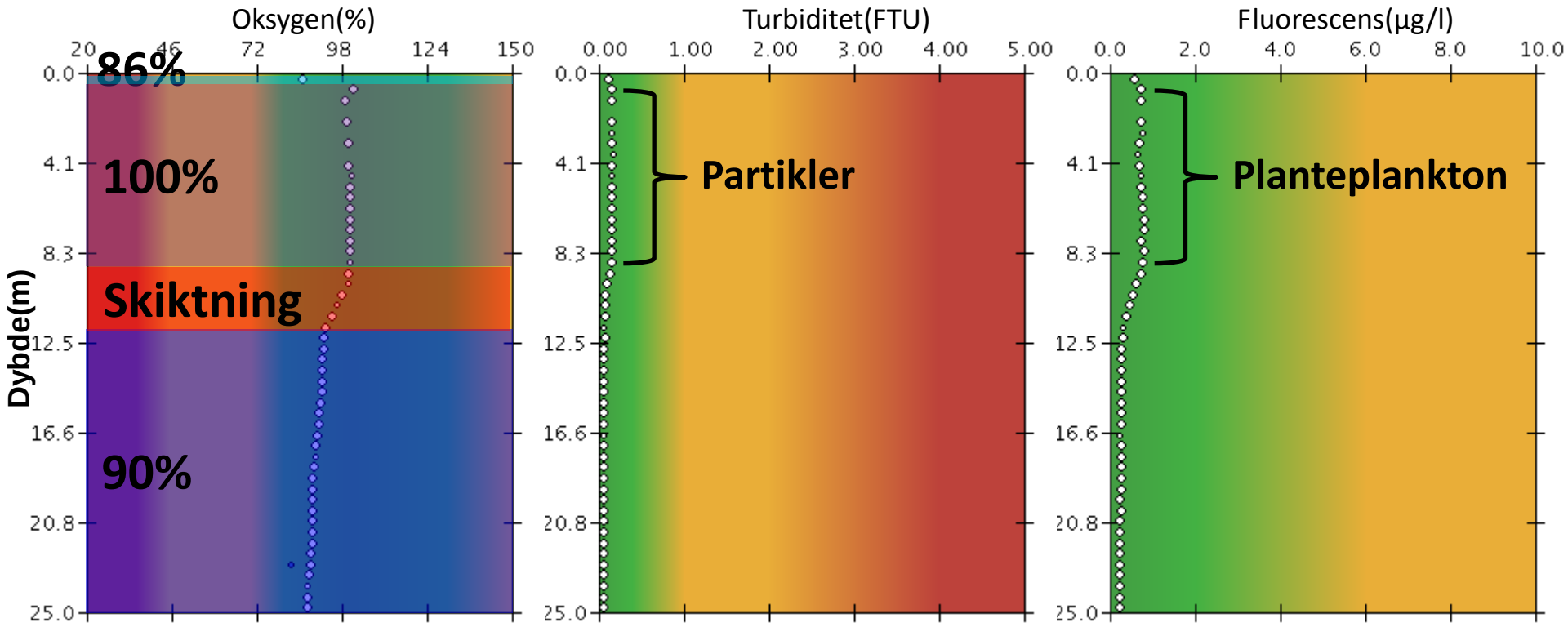

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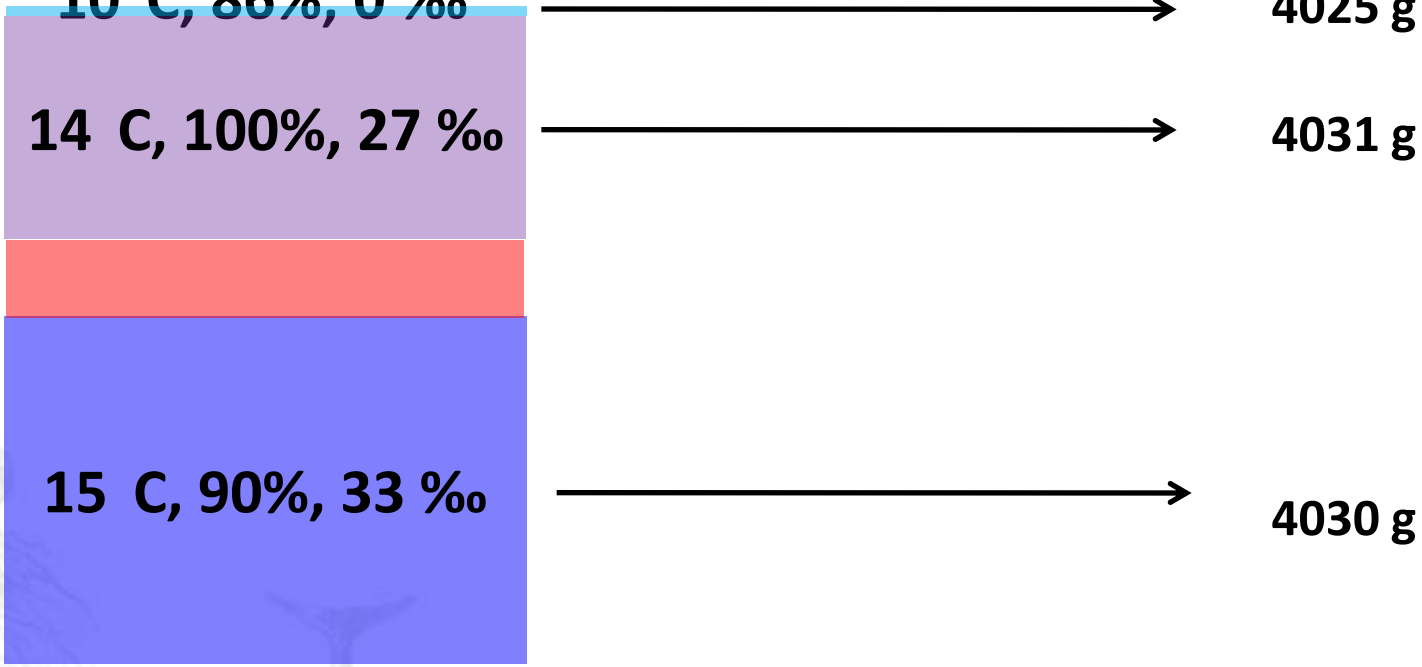
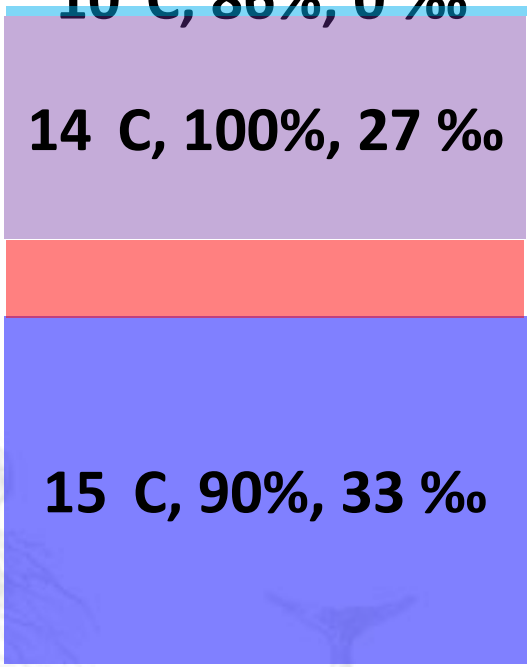
Effekt på vekst

Vekstmodell for en 4000 g fisk (24t).
Thomas Torgersen



Effekt på vekst

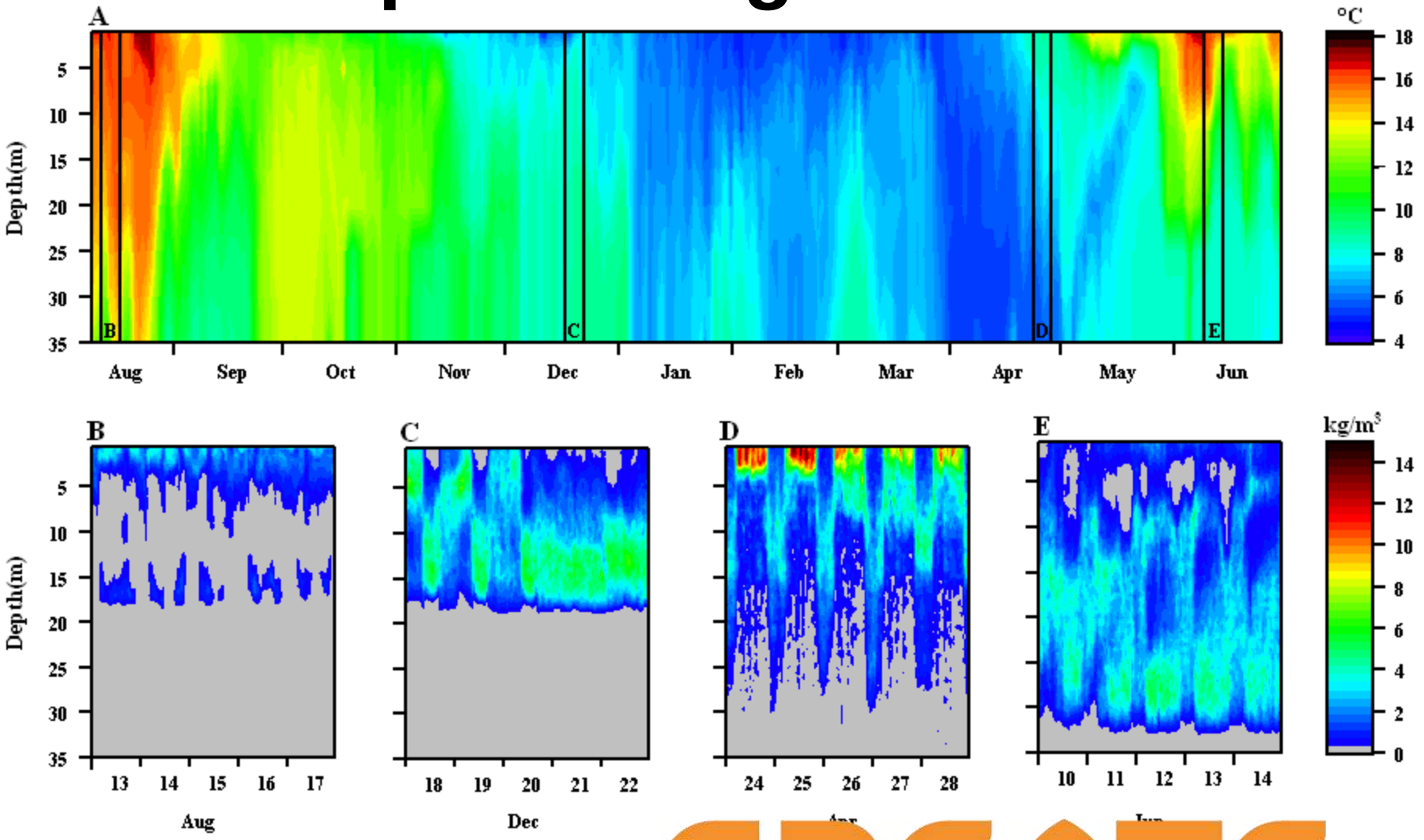
Vekstmodell for en 4000 g fisk (30 d).
Thomas Torgersen



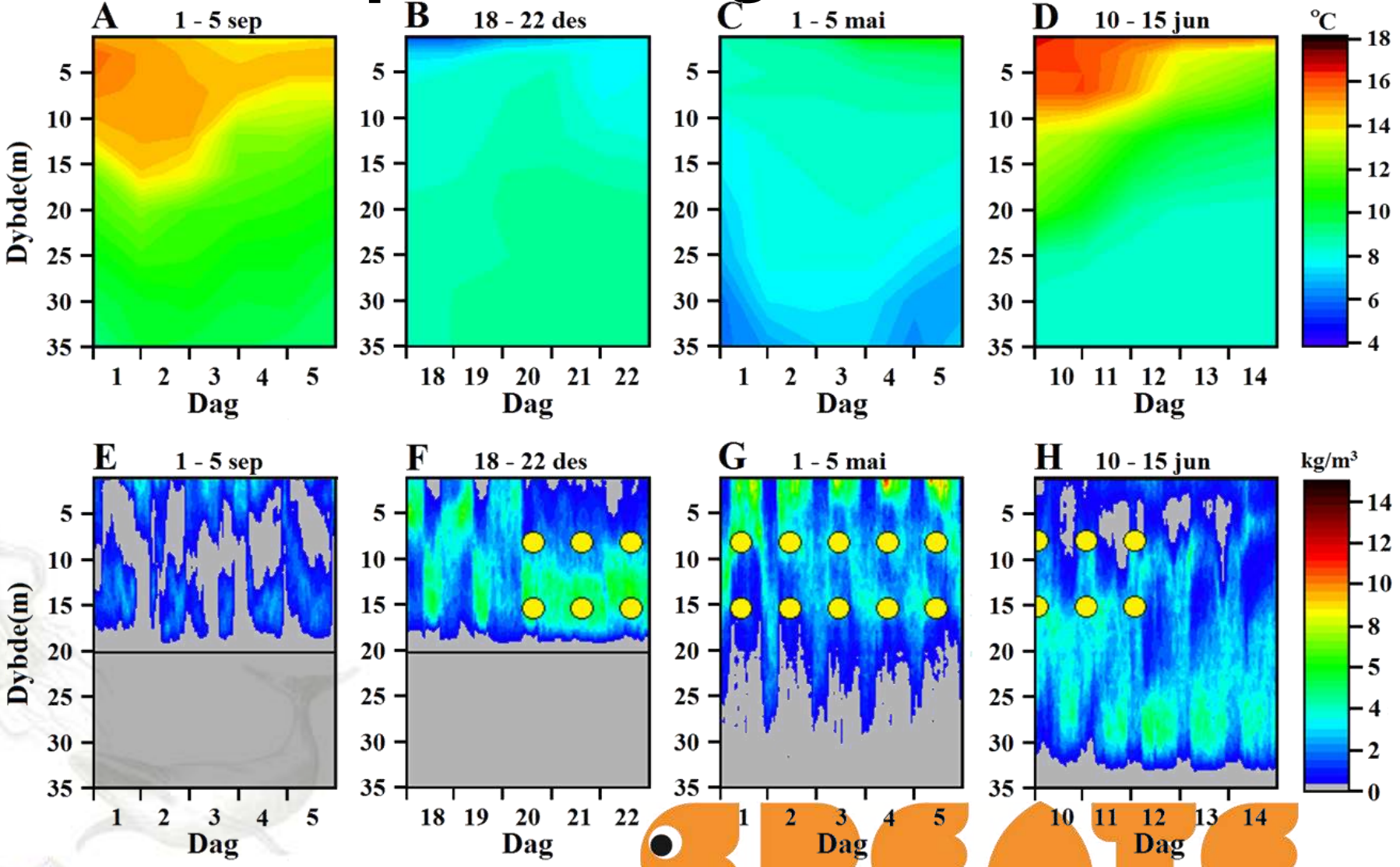
4988 g

4977 g

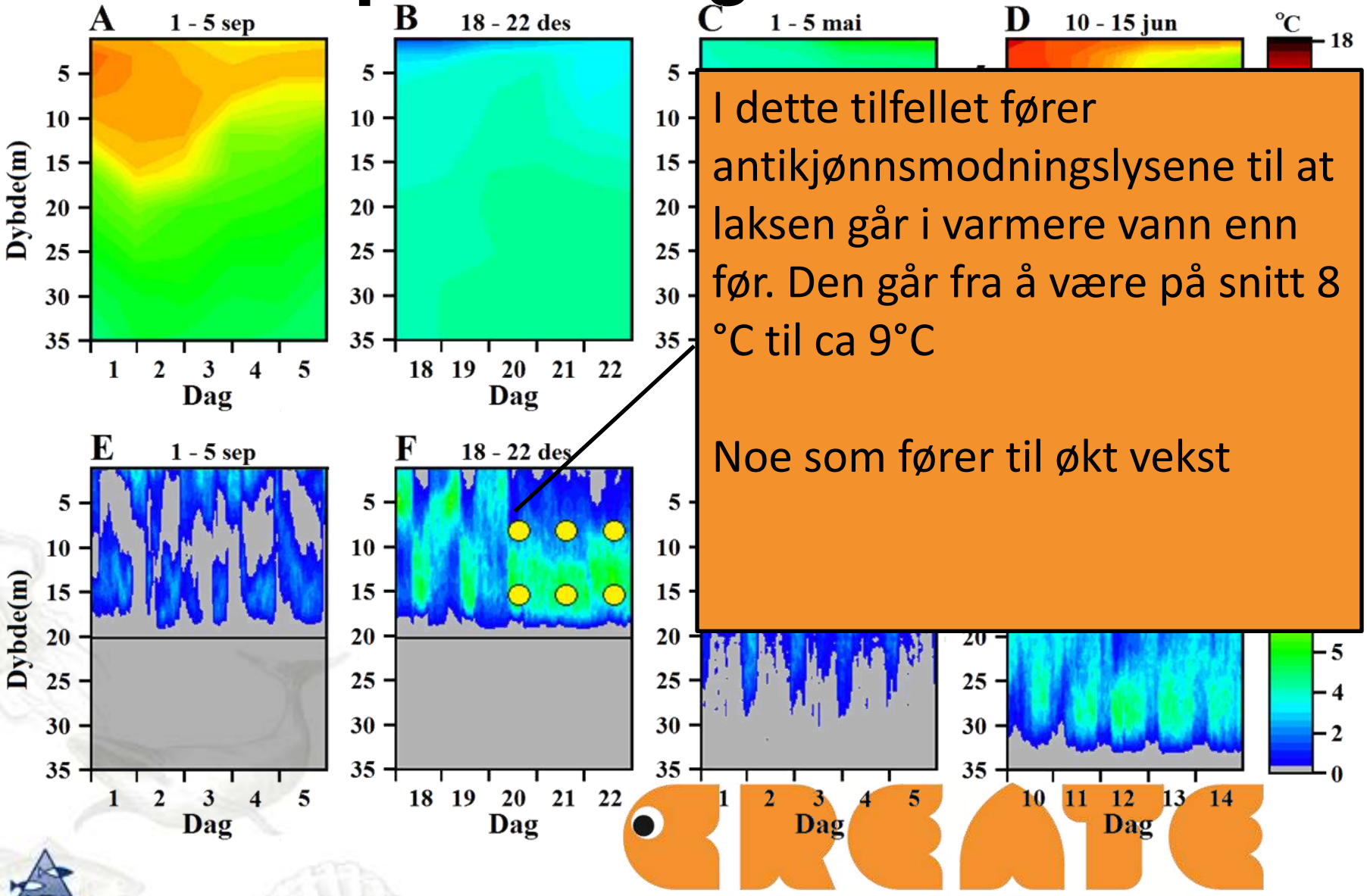
Temperatur og fiskeadferd



Temperatur og fiskeadferd



Temperatur og fiskeadferd



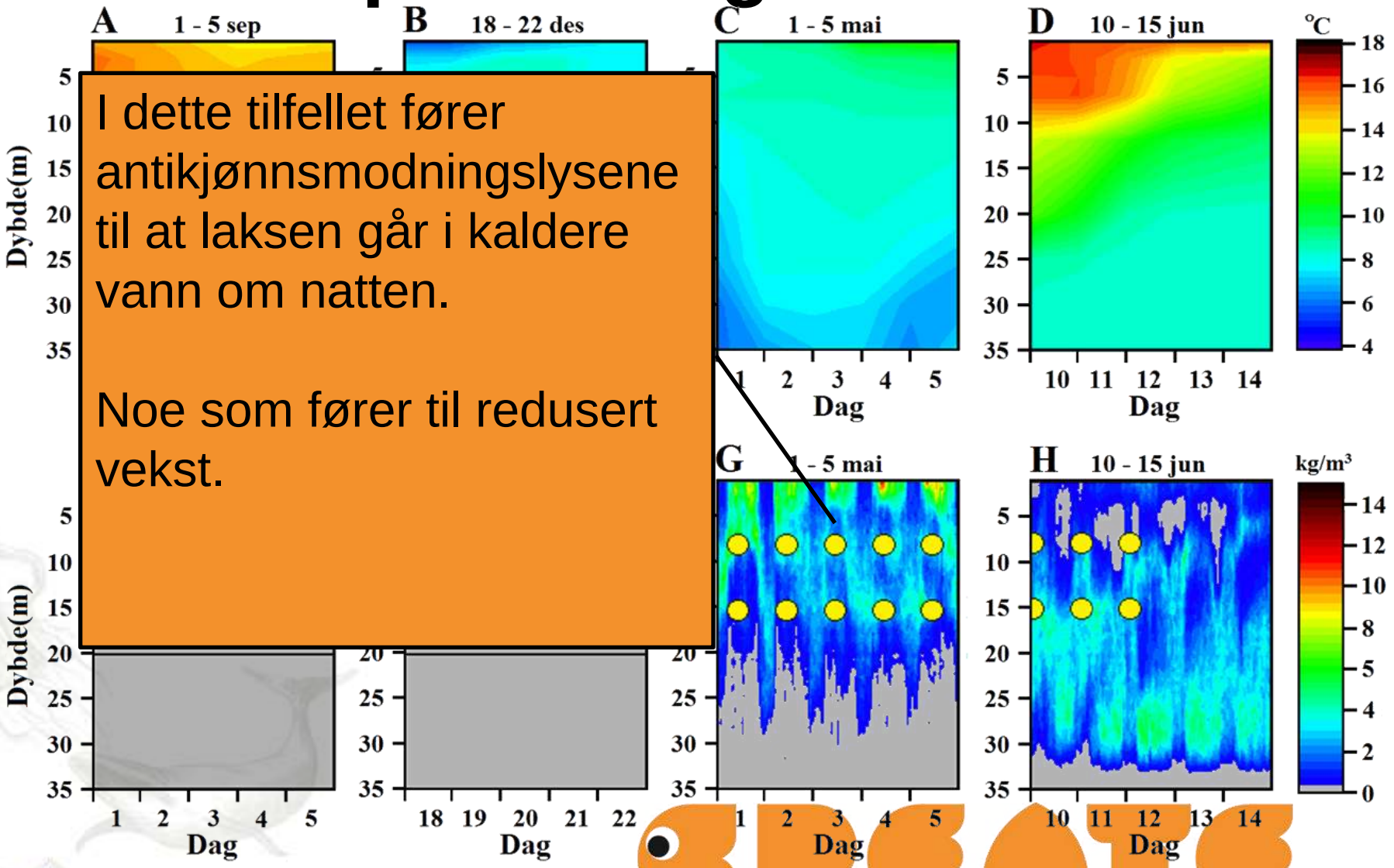
I dette tilfellet fører antikjønnsmodningslysene til at laksen går i varmere vann enn før. Den går fra å være på snitt 8 °C til ca 9°C

Noe som fører til økt vekst

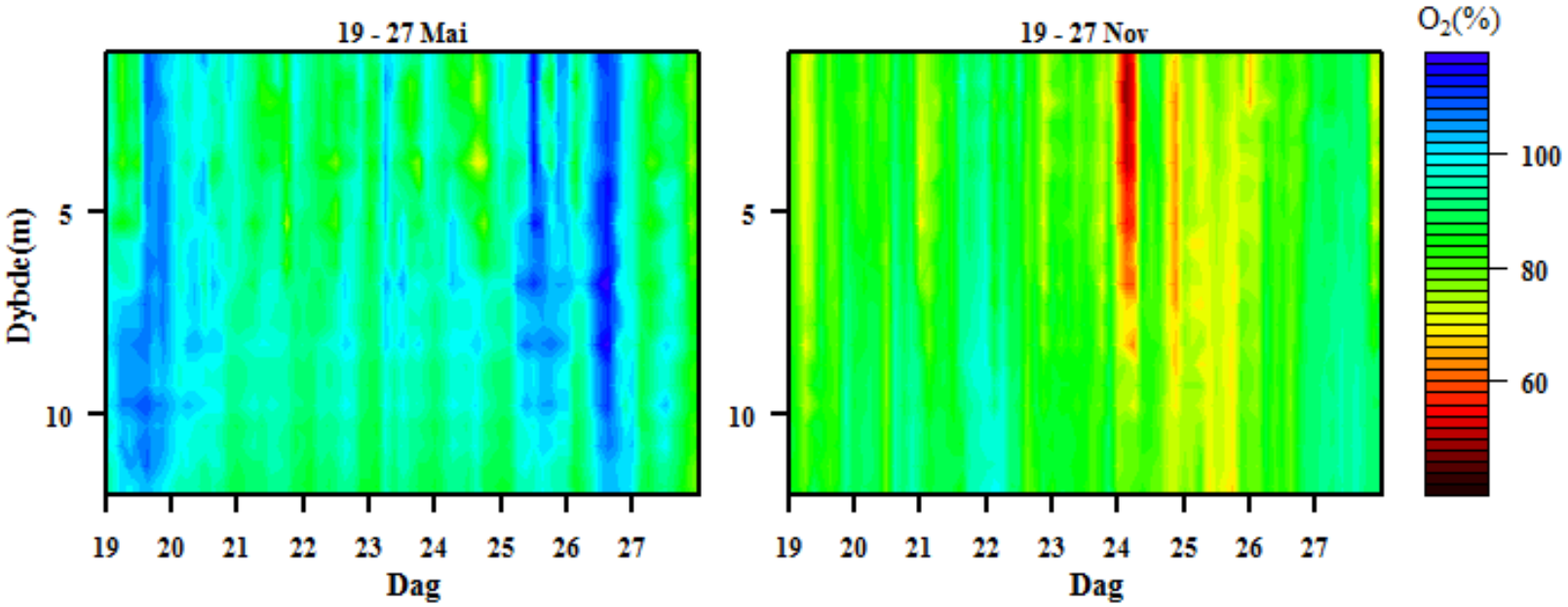
Temperatur og fiskeadferd

I dette tilfellet fører antikjønnsmodningslysene til at laksen går i kaldere vann om natten.

Noe som fører til redusert vekst.



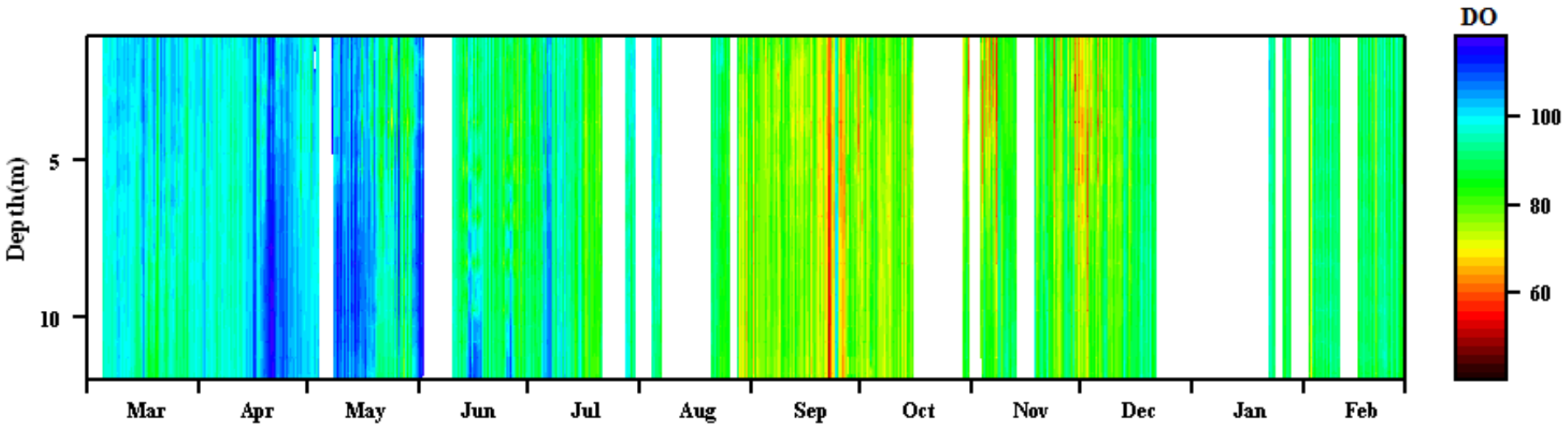
Eksempler på variasjon i oksygen



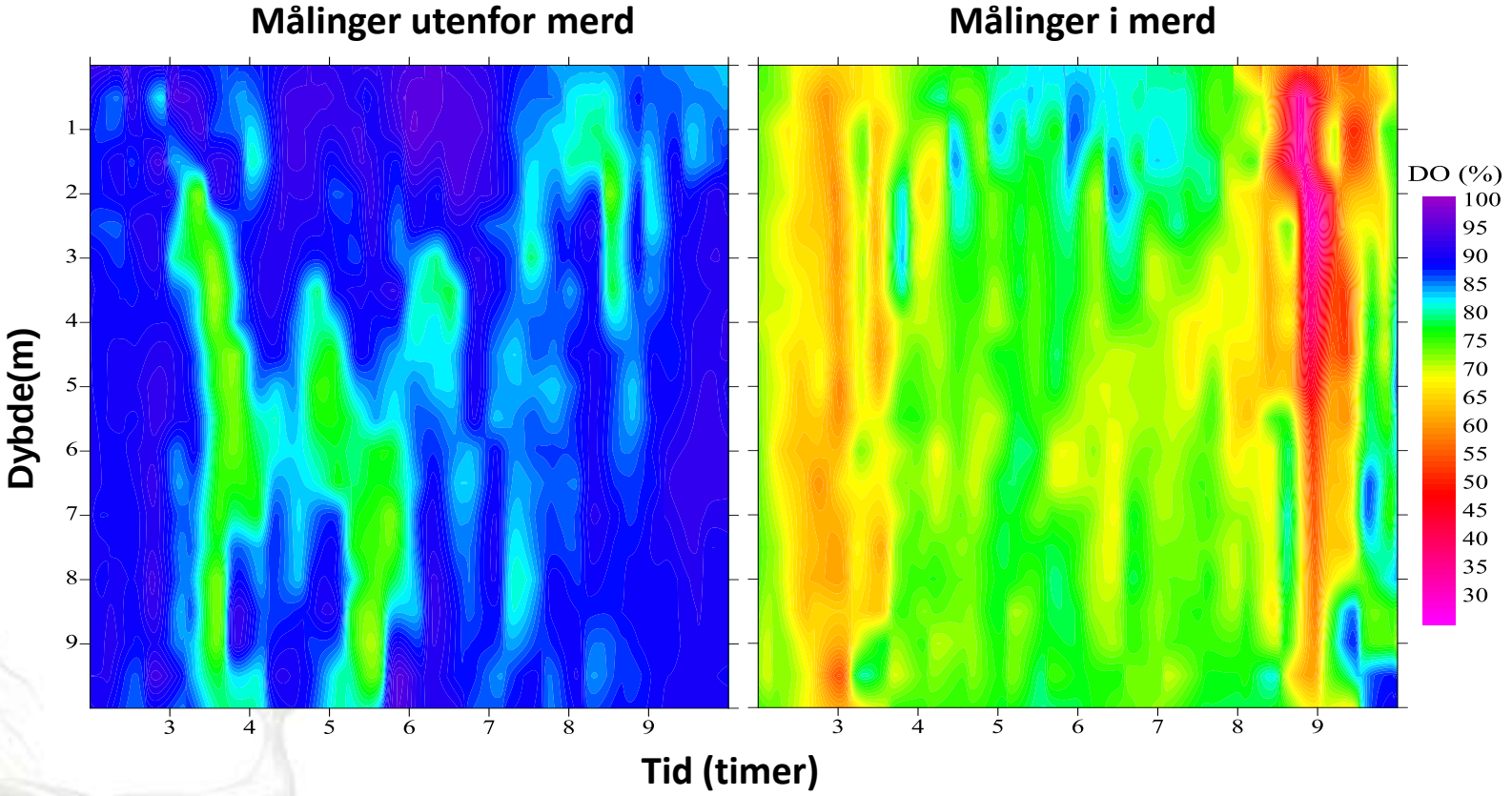
Tidvis overmetning om våren.

Tidvis alvorlig oksygenmangel om høsten (hypoksi).

Eksempler på variasjon i oksygen

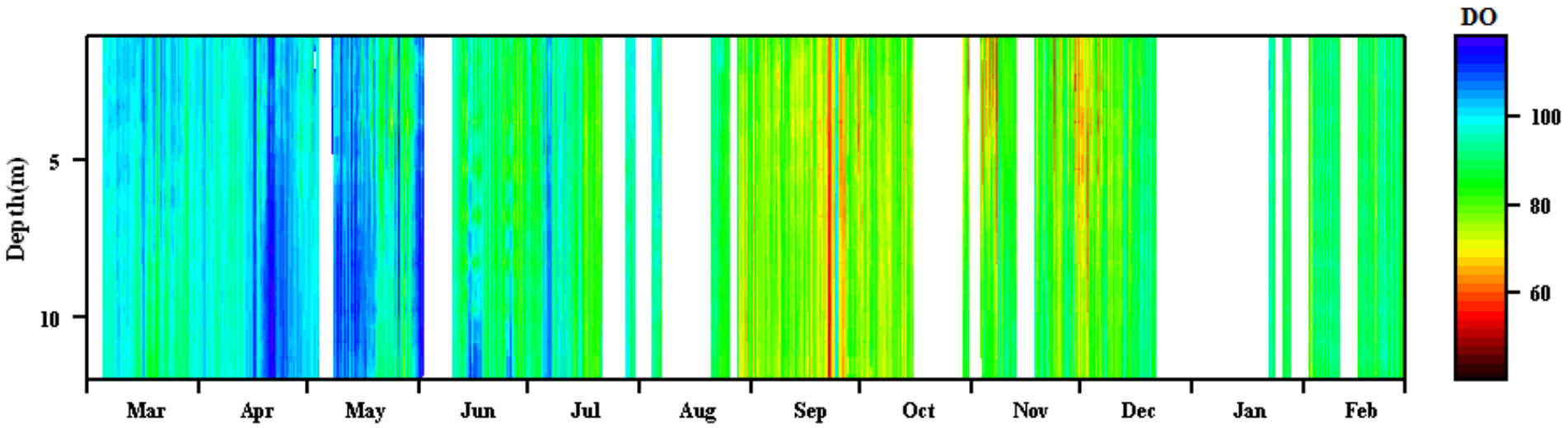


Eksempler på variasjon i oksygen



Tidevannslokalitet (fra Vigen, 2008). Merdstørrelsen var 24 × 24 × 15 m dyp og de fleste av de ca 110 000 postsmolt laksene (ca 700 g, 77 tonn totalt) svømte i de øverste 10 meterne, tetthet: 7 to 15 kg m^{-3}

Mangler ordentlige gode tidsserier



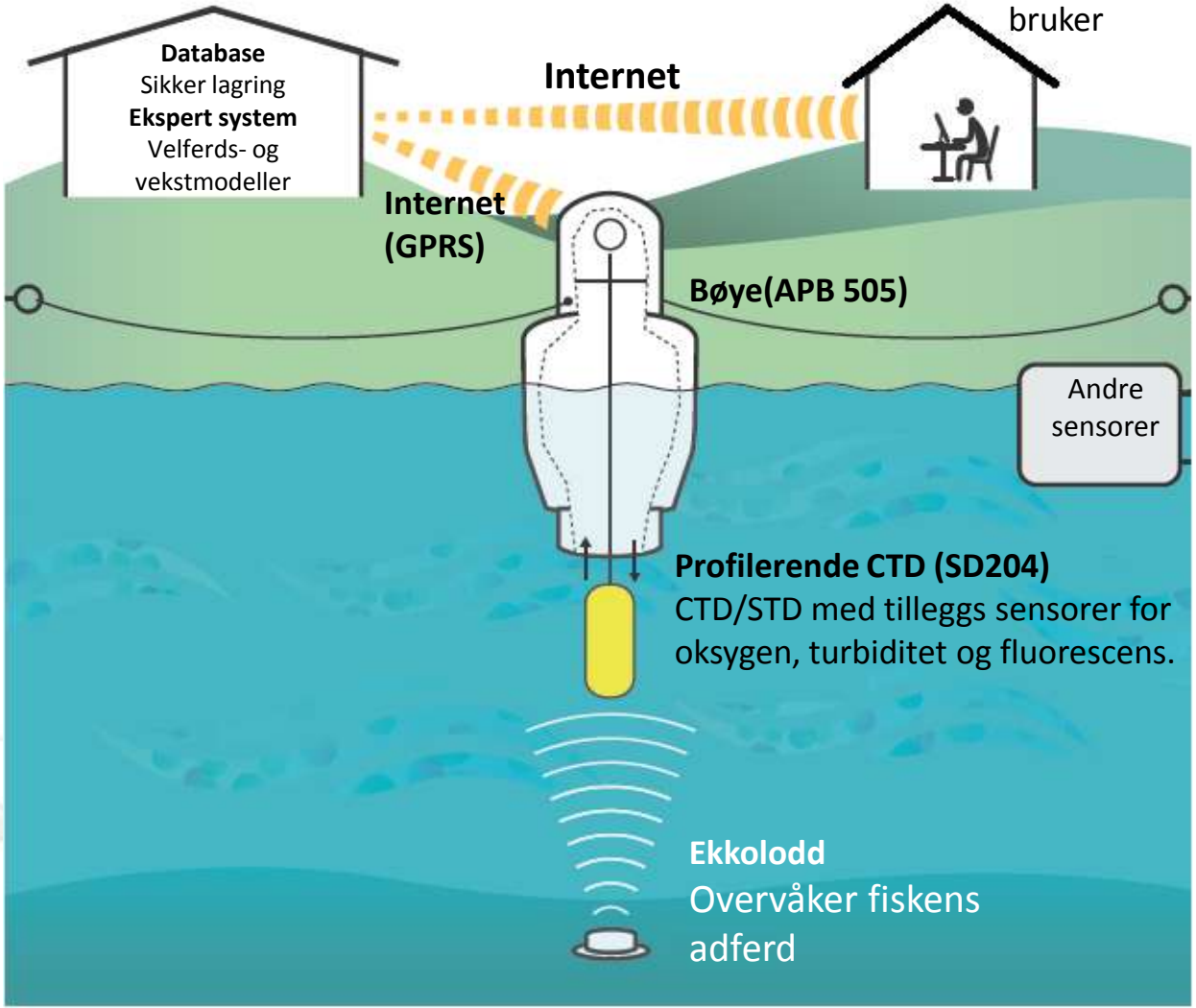
De hvite feltene er data som mangler.

WELFAREMETER 2gen

Et eksempel på system for overvåking og analyse av forholdene i en oppdrettsmerd som vi skal bruke i forskningen vår fremover er Velferdsmeterteknologien.

WELFAREMETER 2gen

Internettapplikasjon
Enkel kommunikasjon med bruker

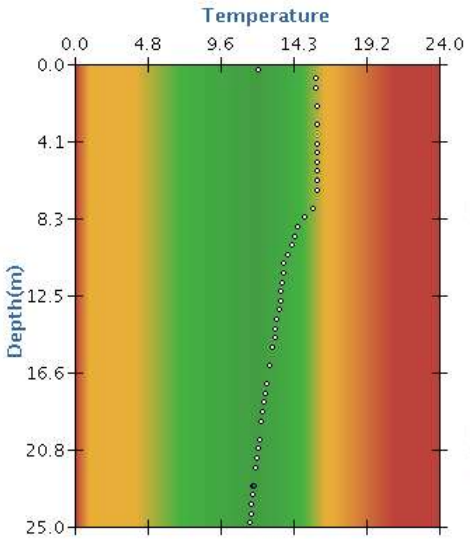


Welfaremeter-Environme...

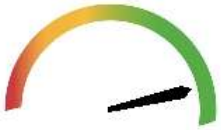
www.imr.no/welfaremeter/environment.htm

WELFAREMETER

- Environment
- Sonar
- Fish data
- Farm data
- Excel
- Setup
- Logout



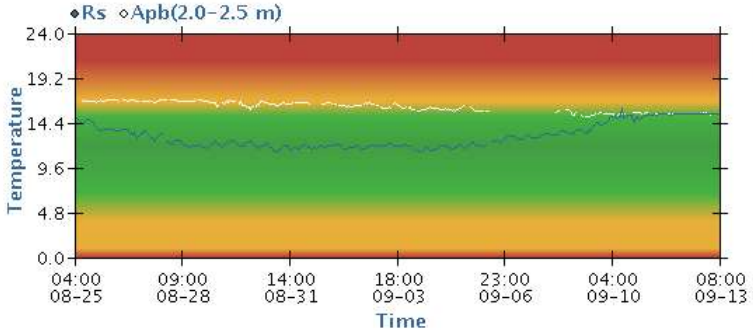
Present index



Evaluation of present environment.

Continuous index

Evaluation of present environment seen in context with past environment variations.



Click on the lower graph (the time graph) to select a time to view details for in the upper graph (the profile graph). Click on a measurement in the profile graph to display this measurement at the selected depth over time in the time graph.

View

Select which cage to inspect.

Cage: SauaN 12

Time: 2010-09-04 05:00:00

Span: 1 hour

Data is shown for the specified cage, date and time.

Variables

List of variables available.

Temperature
Salinity
Oxygen
Turbidity
Fluorescence

Click on variable-link to watch respective data.

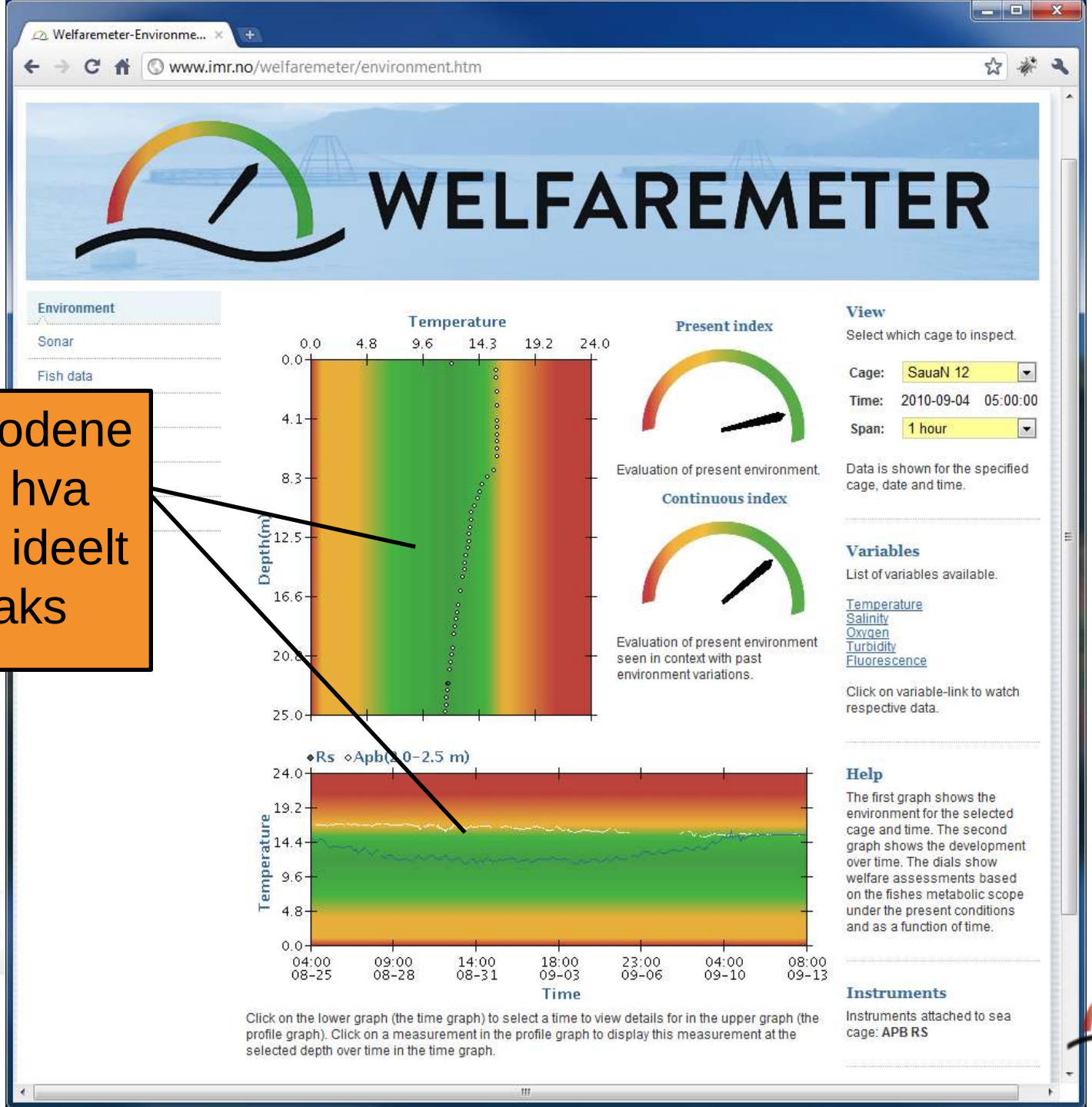
Help

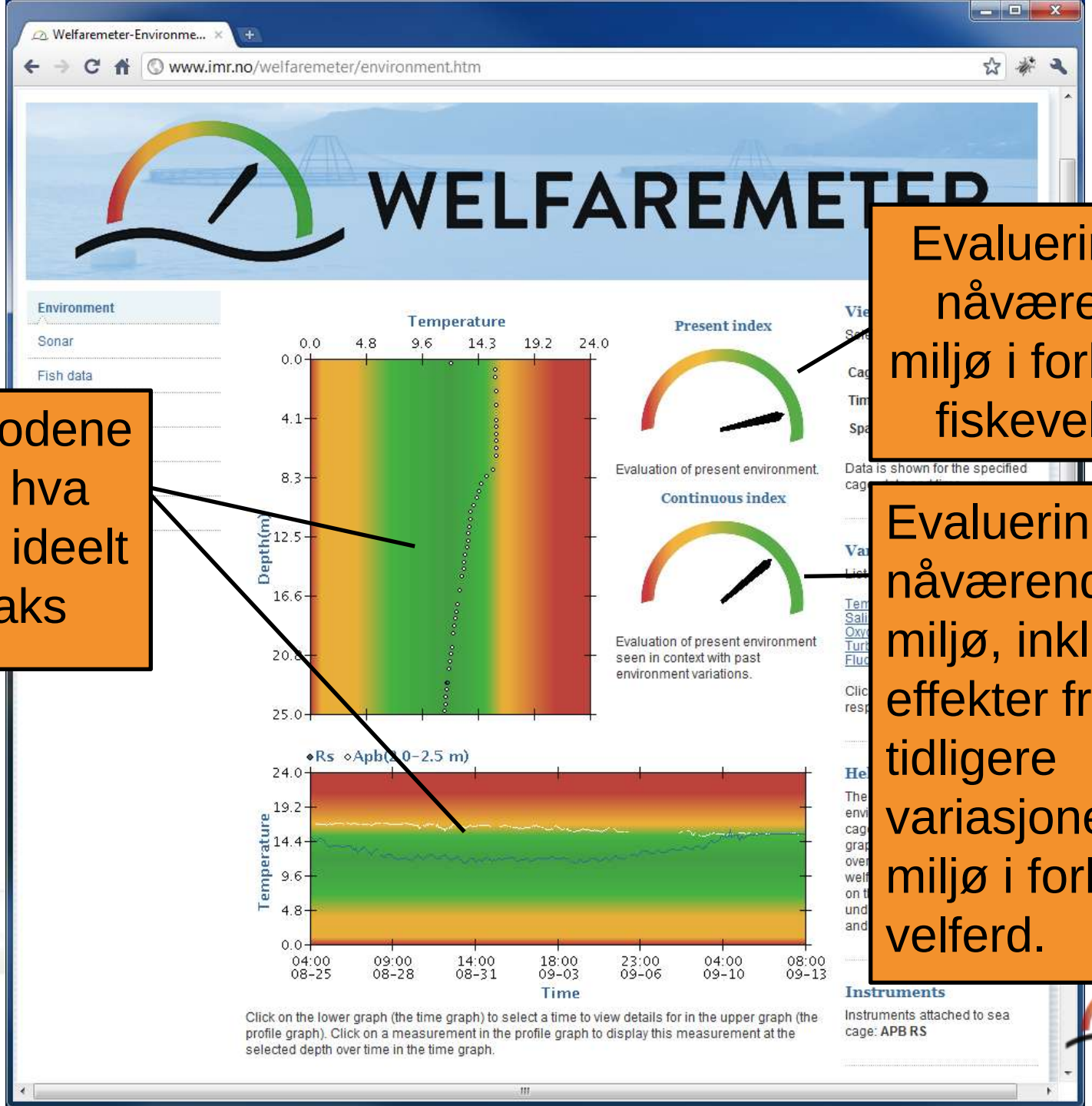
The first graph shows the environment for the selected cage and time. The second graph shows the development over time. The dials show welfare assessments based on the fishes metabolic scope under the present conditions and as a function of time.

Instruments

Instruments attached to sea cage: **APB RS**

Fargekodene angir hva som er ideelt for laks





Fargekodene angir hva som er ideelt for laks

Evaluering av nåværende miljø i forhold til fiskevelferd

Evaluering av nåværende miljø, inkludert effekter fra tidligere variasjoner i miljø i forhold til velferd.

Welfaremeter-Environme...

www.imr.no/welfaremeter/environment.htm

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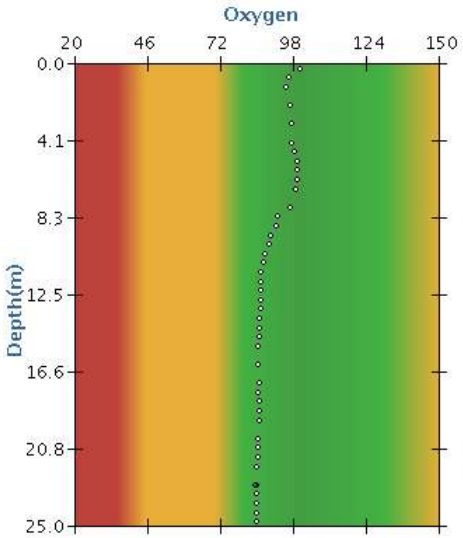
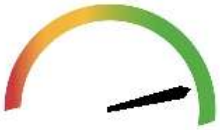


Present index



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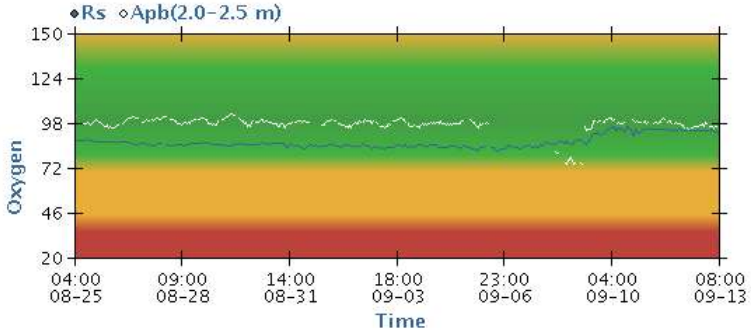

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Welfaremeter-Sonar

www.imr.no/welfaremeter/sonar.htm

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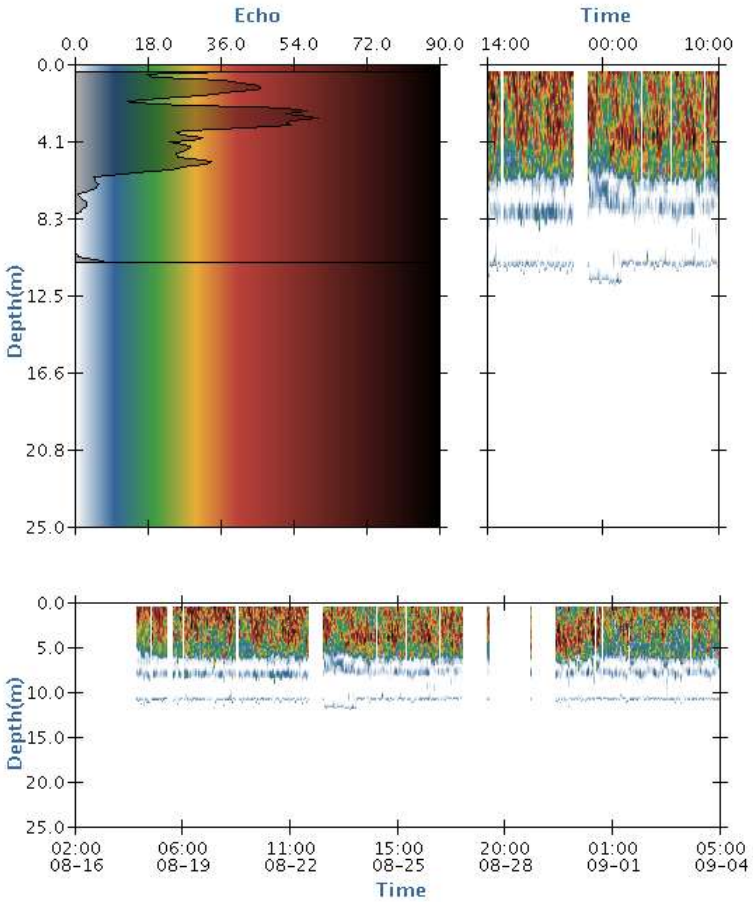

Click on the lower graph (the time graph) to select a time to view details for in the upper graphs.

View

Select which cage to inspect.

Cage: SauaN 12

Time: 2010-09-05 10:00:00

Span: 1 hour

Data is shown for the specified cage, date and time.

Help

The First graph shows the actual echo values registered by the sonar at the selected time. The two other graphs show the development over time. The colouring of these graphs is given by the background colouring scale of the first graph.

Cage eye

Some text

Kunnskap om merdmiljø