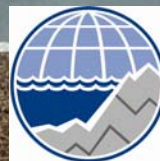


The Luminescence and Marine Plankton (LAMP) project

Stuart Painter,
John Allen,
Charlotte Marcinko,
Martha Valiadi,
Debora Iglesias-
Rodriguez,
Adrian Martin

Annual Science Meeting
Plymouth 11 – 13 May 2010



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The LAMP Project

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What is bioluminescence?



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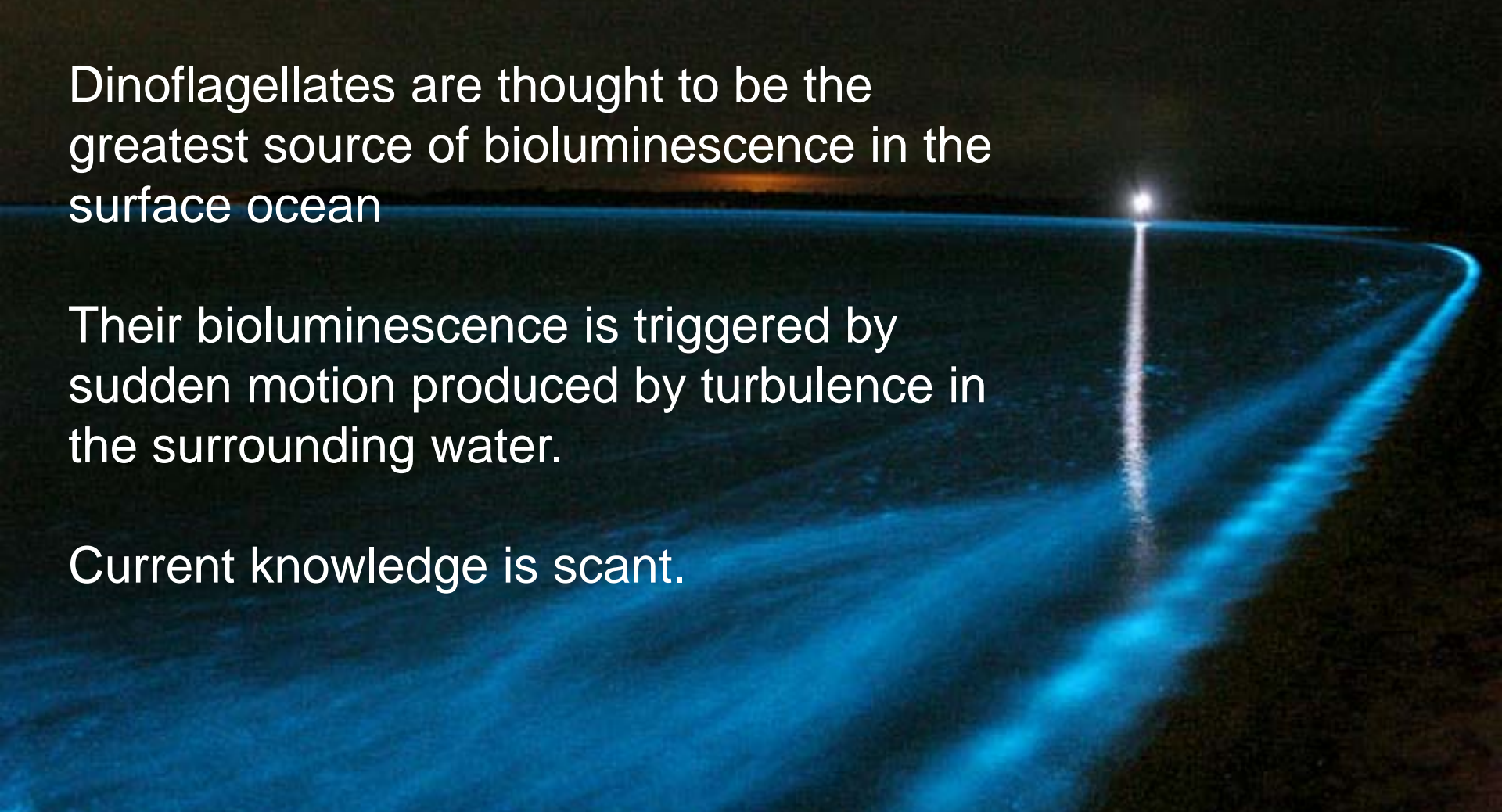
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Dinoflagellates are thought to be the greatest source of bioluminescence in the surface ocean

Their bioluminescence is triggered by sudden motion produced by turbulence in the surrounding water.

Current knowledge is scant.



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LAMP is a DSTL-funded, blue skies, research-led programme investigating dinoflagellate bioluminescence.

It consists of

- literature synthesis*
- targeted field observations
- molecular investigations
- modelling study

* Progress In Oceanography, Marcinko et al, in review



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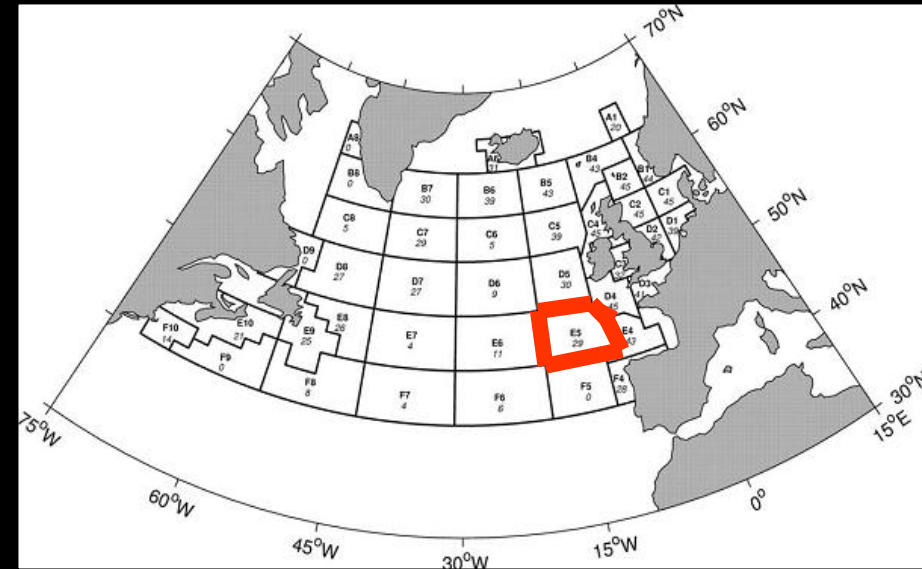
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When is bioluminescence most likely to occur?

Modelling and fieldwork based study focussed on region of NE Atlantic:

- Region E5 well sampled by CPR (SAHFOS bursary)
- Long standing time-series on Porcupine Abyssal Plain*



*PAP Special Issue,
Deep Sea Research II, 2010, in press



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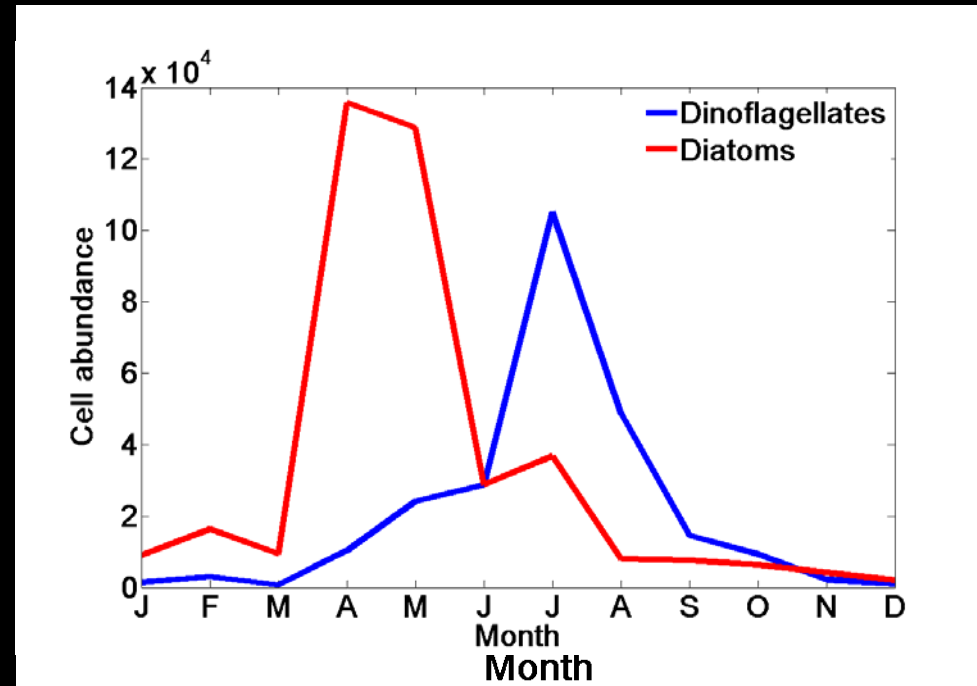
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When will largest concentrations of the organisms responsible be present?

2 stage approach:

- Can we use total dinoflagellates as a proxy for bioluminescing ones?
- Can we predict changes in abundance of total dinoflagellates?

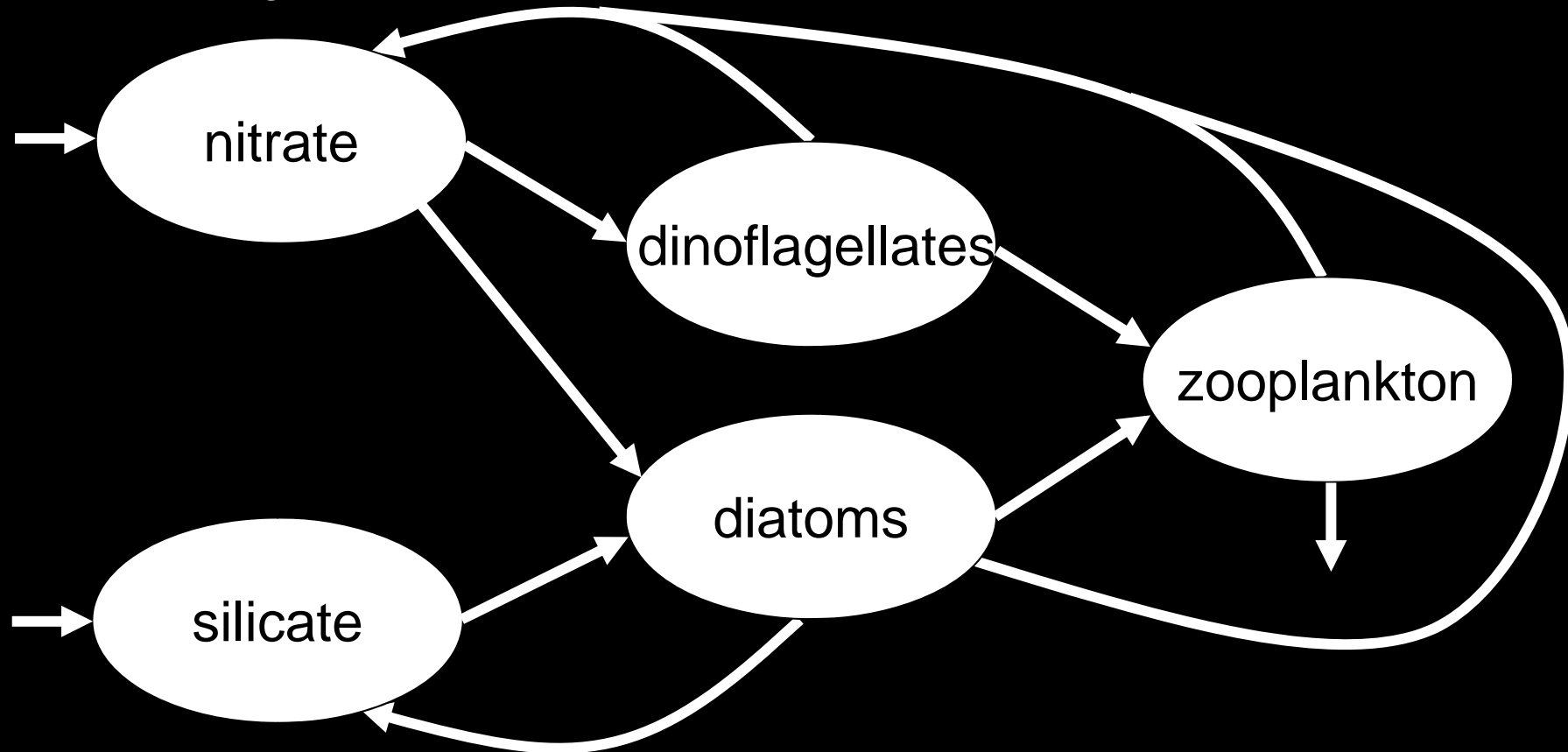


CPR data courtesy of SAHFOS



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Simple biogeochemical model for surface waters

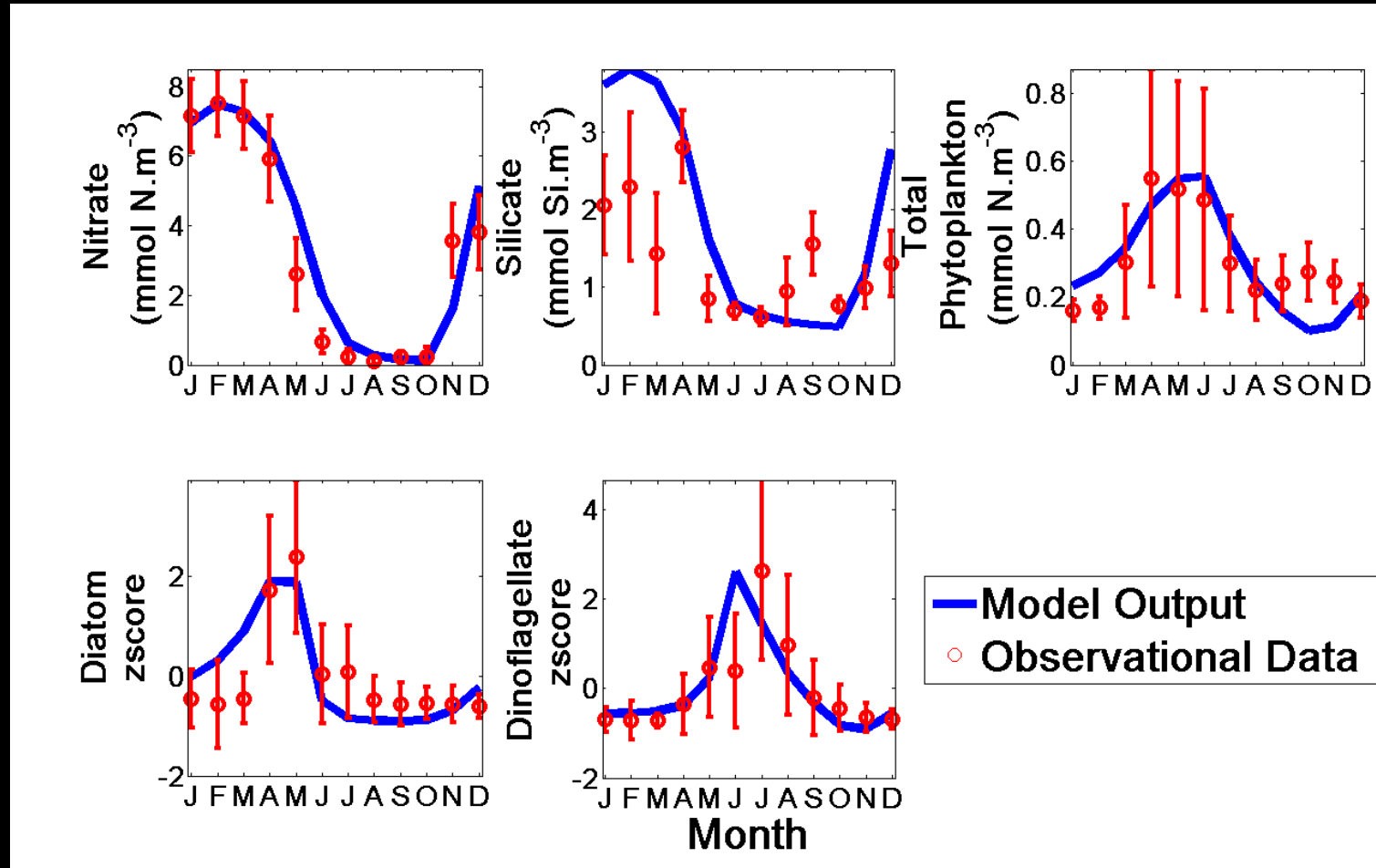


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Outcomes...

- biogeochemical model, a promising means of predicting seasonal peaks in dinoflagellate abundance
- empirical relationship for when bioluminescence most likely
- several datasets under analysis to determine how bioluminescent 'potential' changes spatially
- molecular probe for the presence of bioluminescent dinoflagellates