

Modellering, nýtsla fyri alivinnuna?

Sissal Erenbjerg (Fiskaaling, Fjarðelvi) og Bogi Hansen (Havstovan)

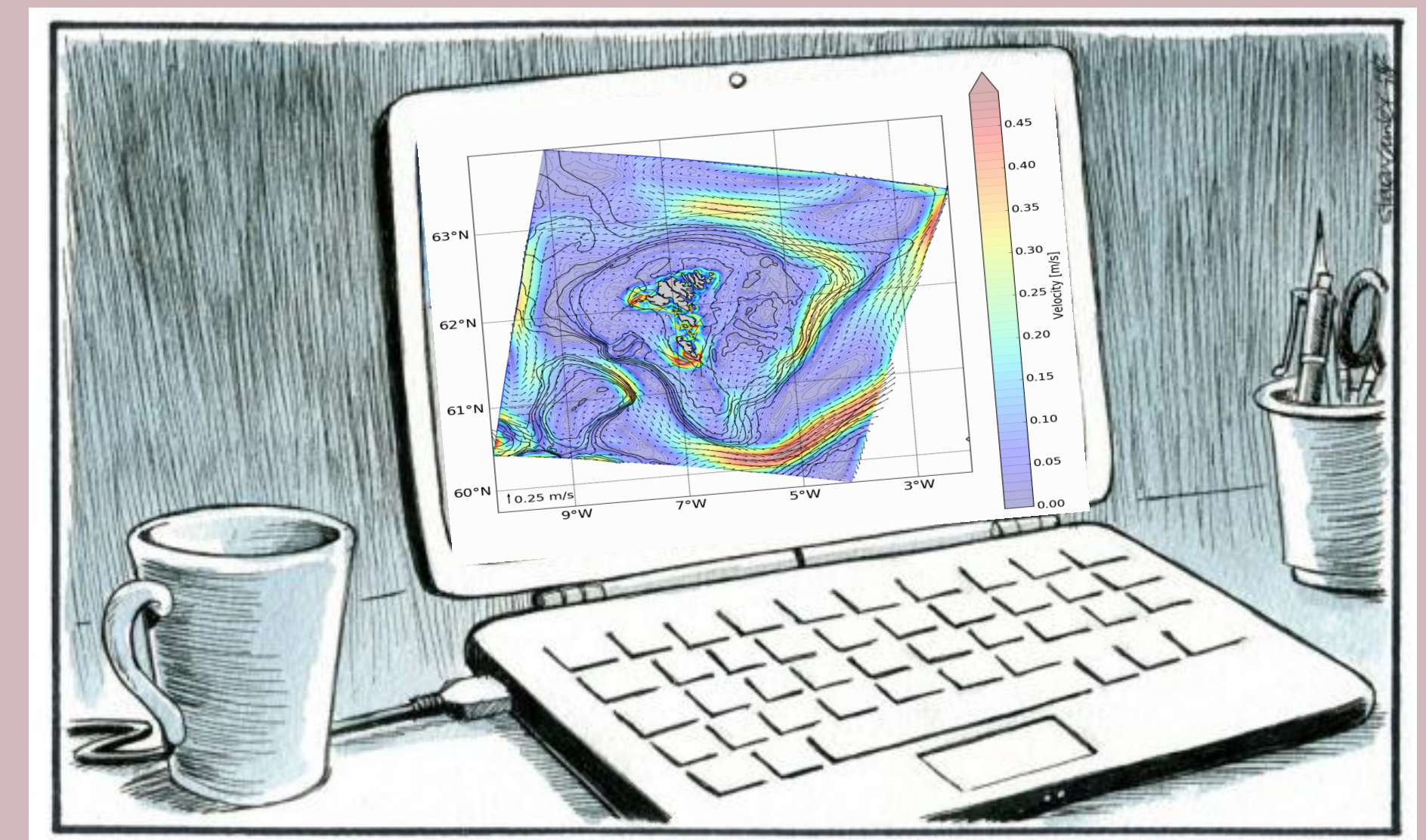
- **Outline:**

- Hvat er modellering? Hvar og Hvat!

- Formalisma og numerik 

- Hvar nýta vit tað á Fiskaaling?

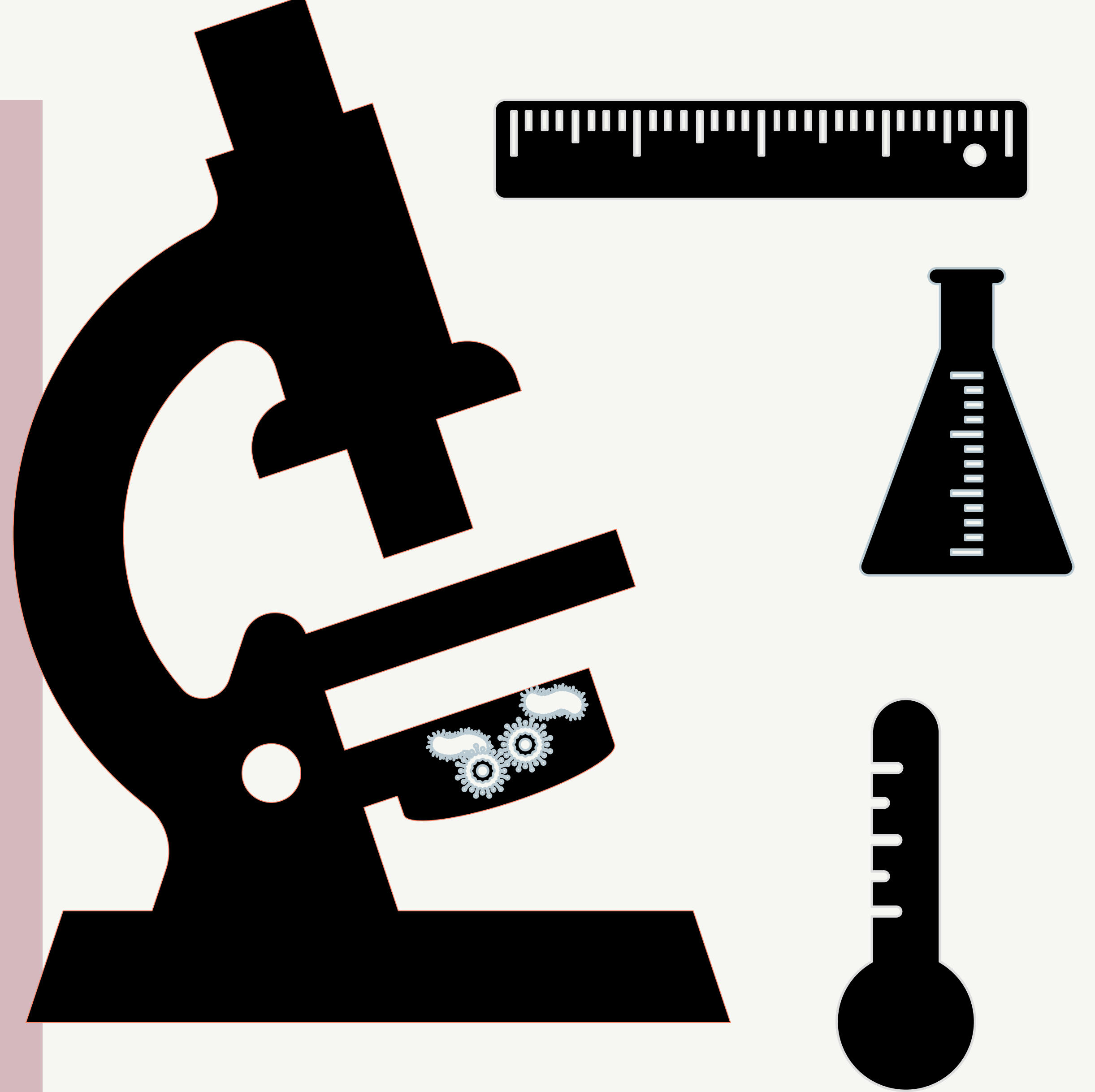
- Dømi: Útskipting á Sundalagið Norður



Hvat er teldu- modellering?

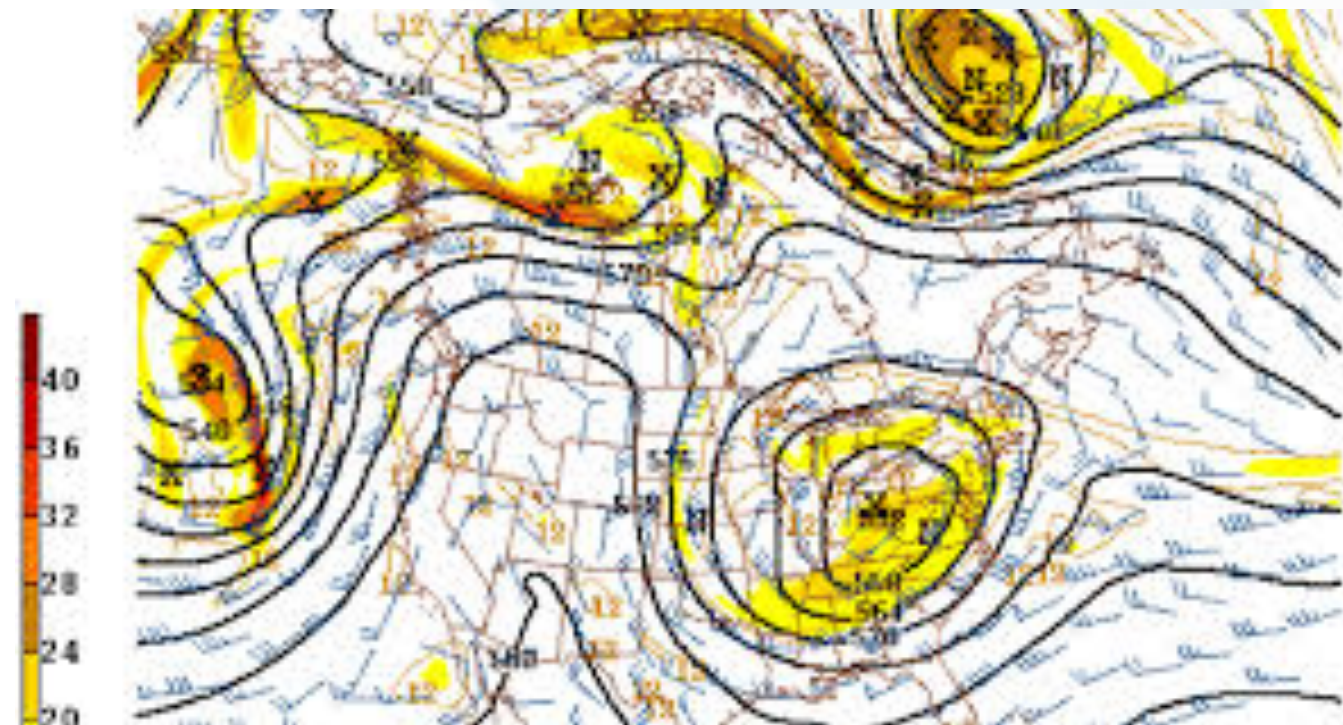
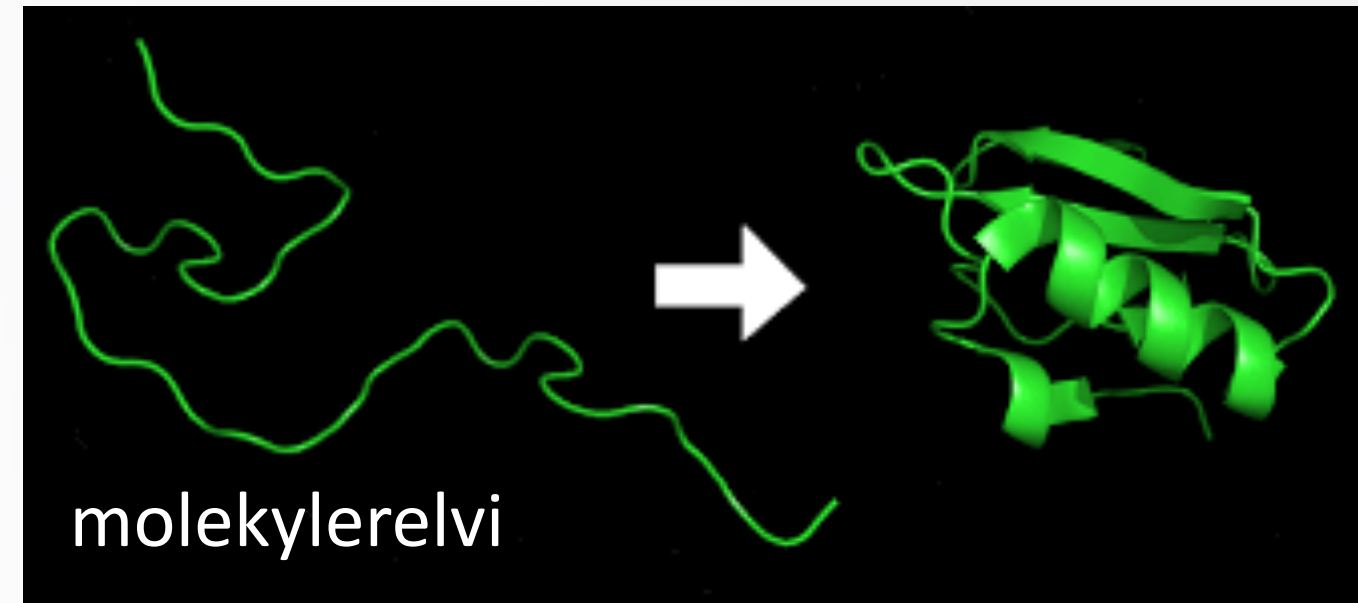
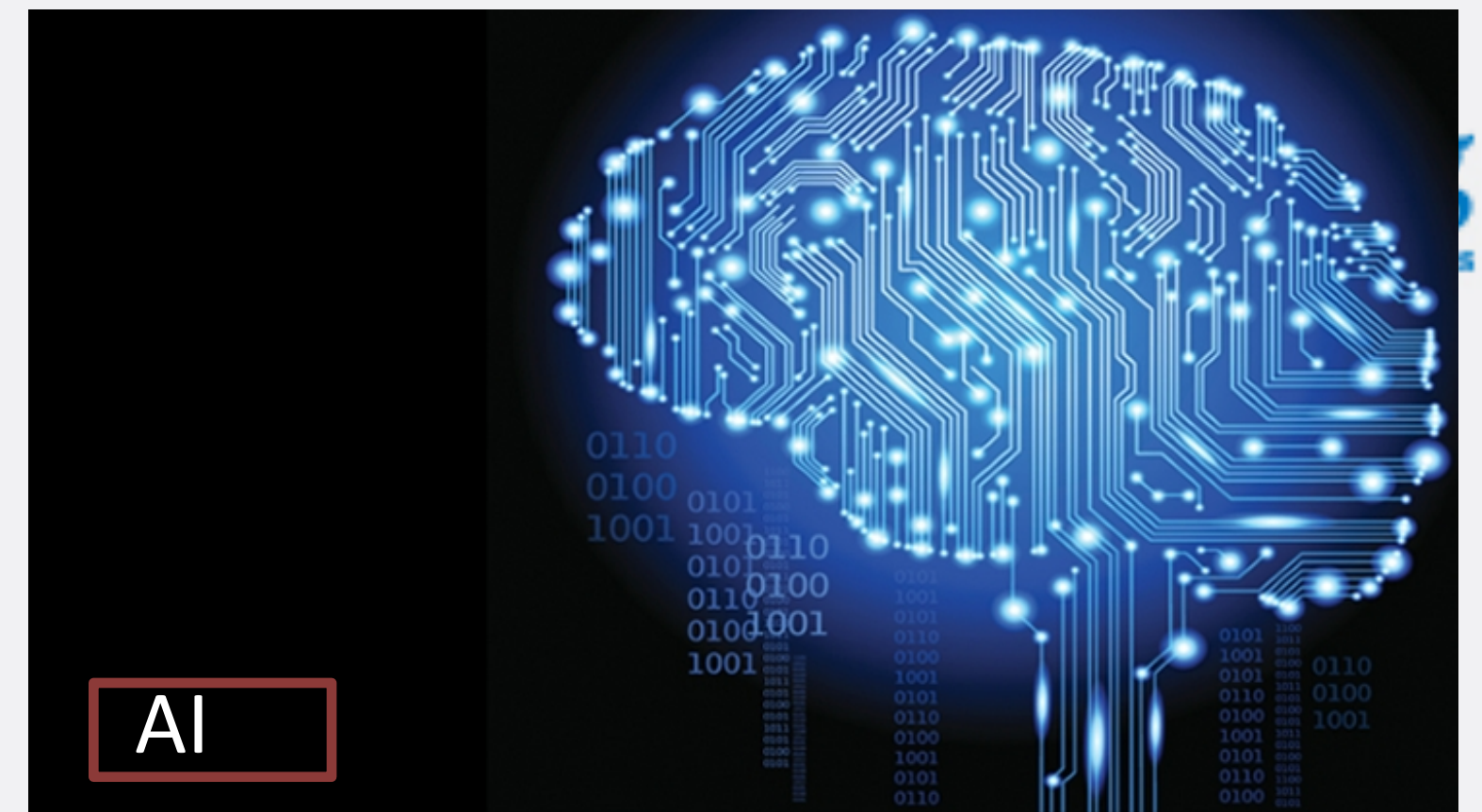
Eitt tól!

Nýtast til at skilja kompliseraðar
processir, bæði stórskala og lítlum skala.



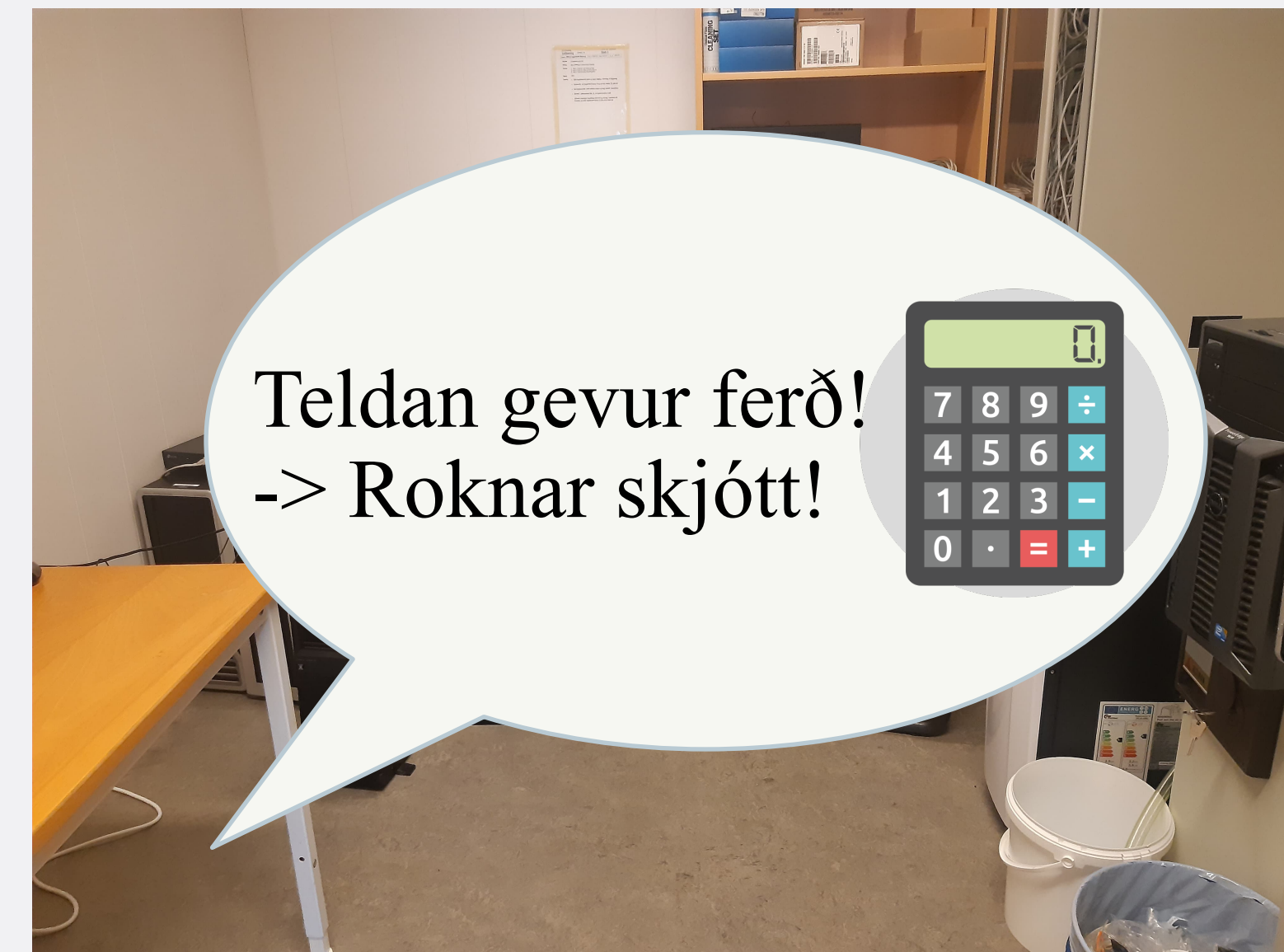
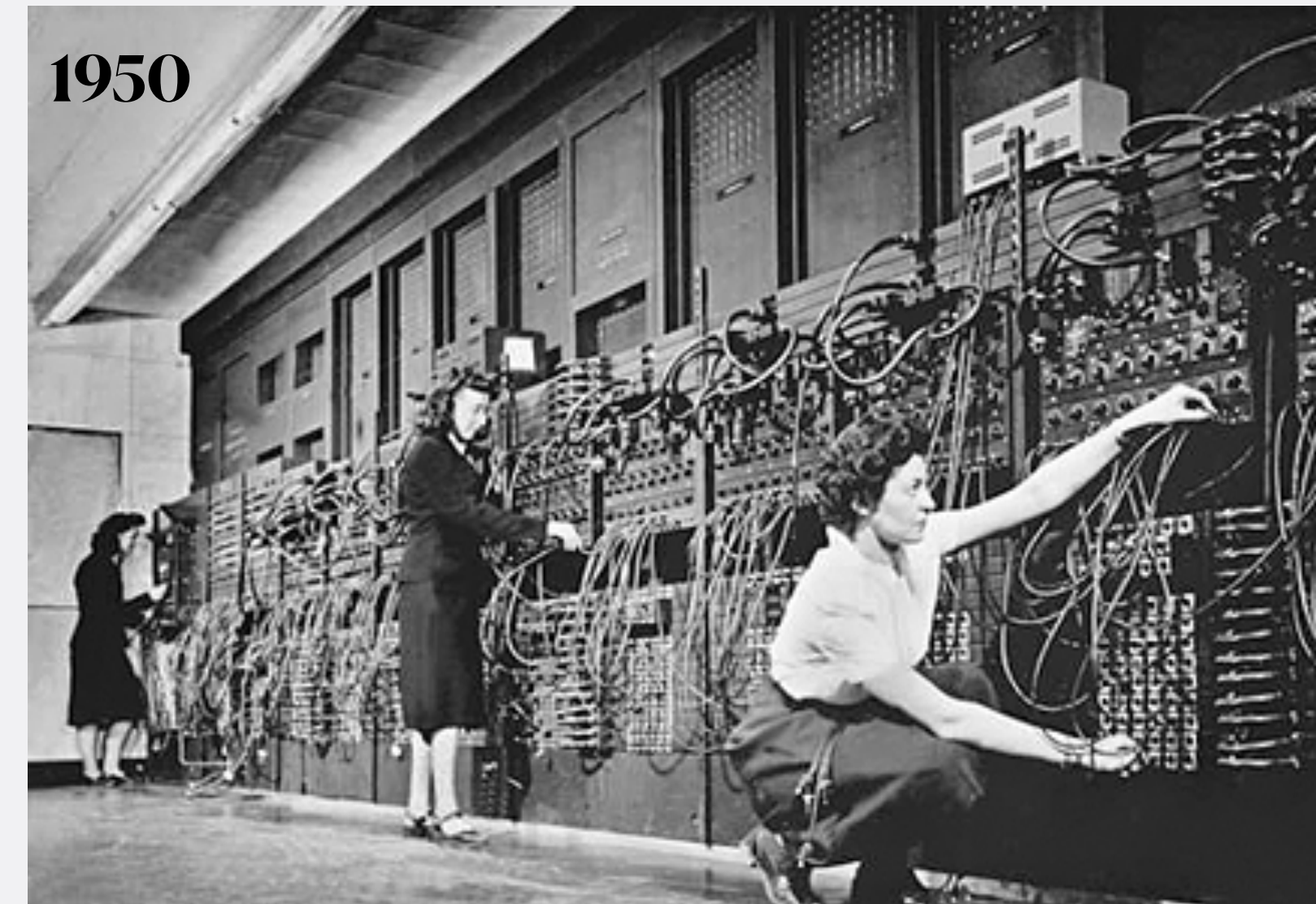
Hvar?

Hvar brúkar man modellering?



Hvat?

Harvard Computer 13. mai 1913



Teldan gevur ferð!
-> Roknar skjótt!



Modelering?:
Simulering
Teldumodellering
Myndil
Telduforsøgn
Prognosa
In Silico
Machine Learning
Koyring
Útrokning

Output:
Visualisering
Úrslit
Input
Results
Simulering
Myndil

Software:
Forritan
Programmering
Koda
Algoritmur
Teldumál

Hardware:
Telda
Fartelda
Háavrikandi teldumegi
Processari
Kjarna
Miðverkeind
CPU

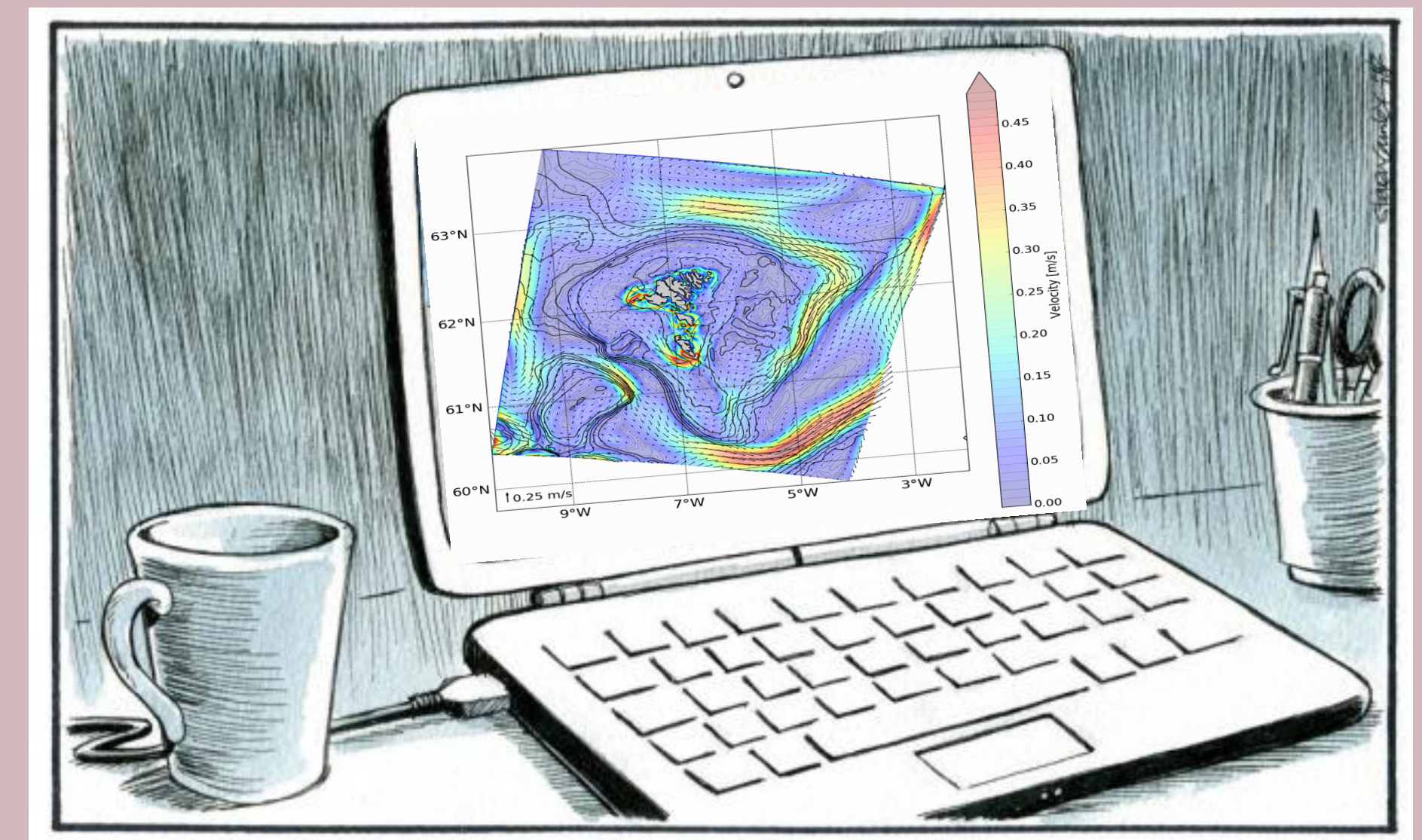
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Formalisma

- **Numerisk Model**

- Hydrodynamisk (Euler) versus Particle Tracking (Lagrange)?

- Eulerian er stabilt, yvir langa tíð
- Lagrangian er óstabilt aftaná nakrar dagar

- **Onnur Model**

- Statistisk Model, Machine Learning
- **Ein blanding av øllum**

UNIVERSITY OF COPENHAGEN

CCAR and DCE

Faculty of Science

Numerical schemes, Eulerian is advantageous for 3D modeling

$\frac{\partial C}{\partial t}$

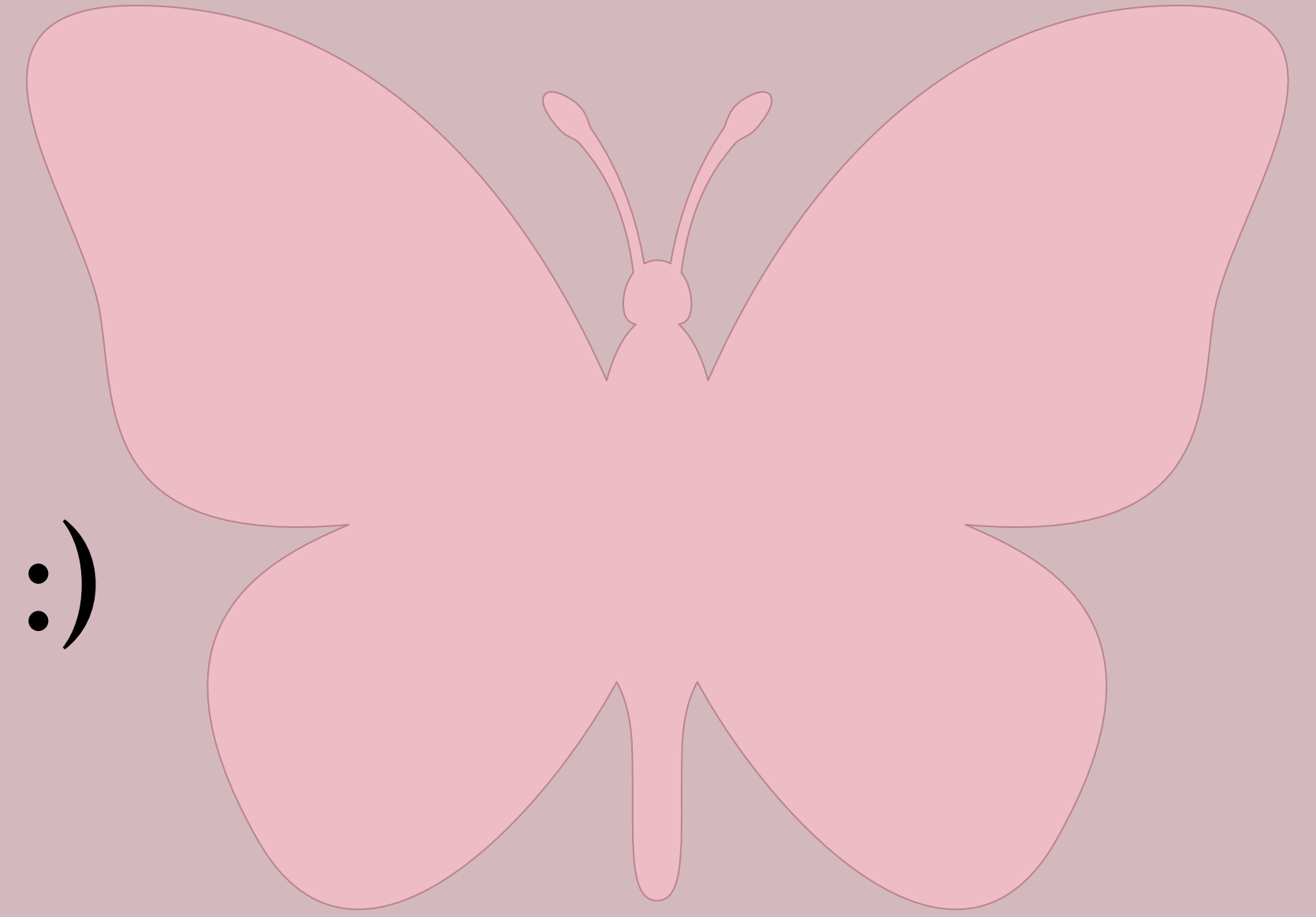
Hví?

↖ Eulerian and Lagrangian ↗

When looking at transport, how to calculate derivative in departure cell?



Svarið er, sera cool matematik :)
“Lorentz Firvaldurin!”



Sigur nakað um at ein model forsøgn ongantið er betri enn útgangsstøgið

Kaos, Lorentz, Butterfly effekt.

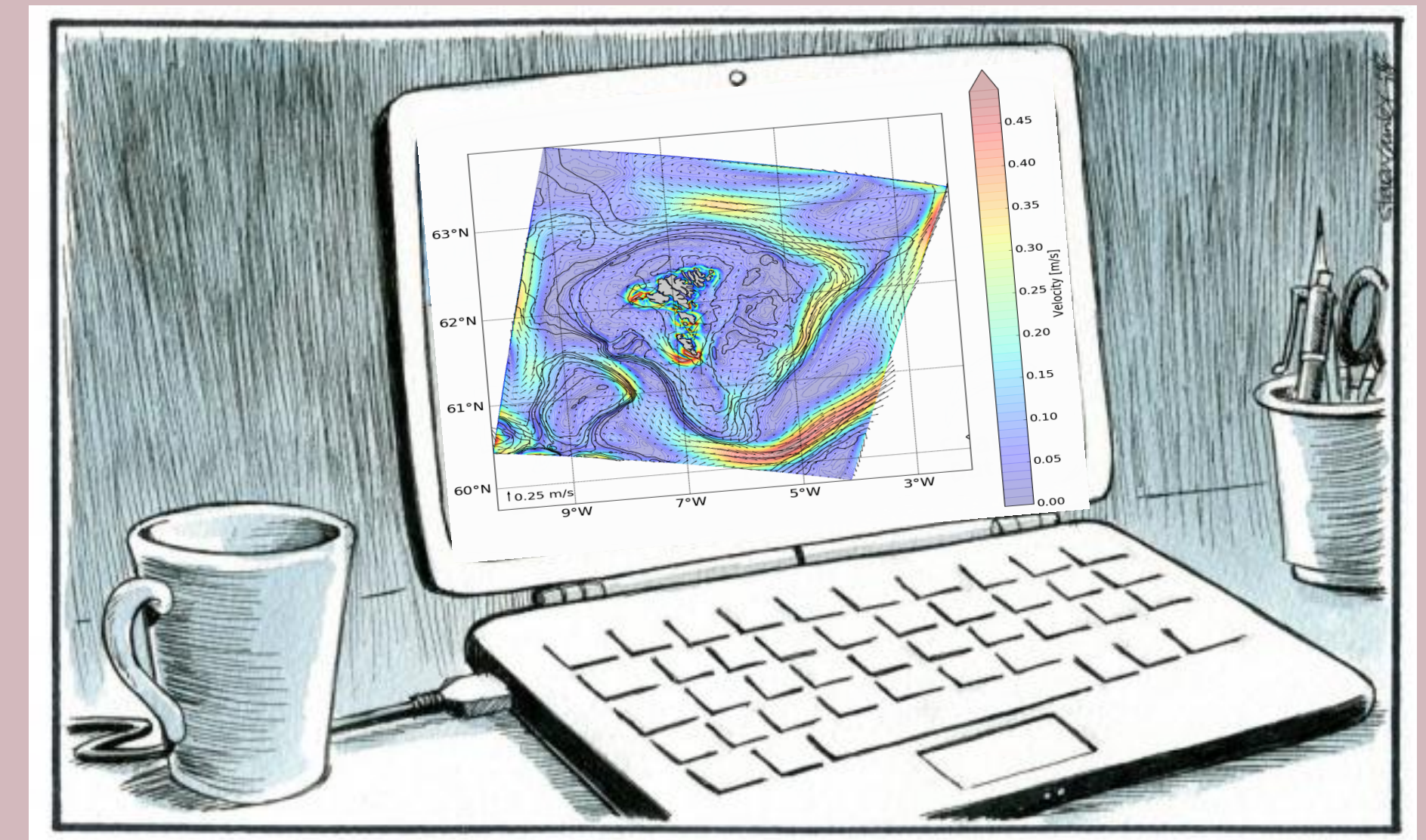
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Hvar nýta vit tað á Fiskaaling?

Lagrangian ella Particle tracking

- Lús (timar/dagar) (+ 2D Euler)
- Deposition/botnfall (s/min/dagar)
- *Rák í gjøgnum alinótir (s/min)*

Hvar nýta vit tað á Fiskaaling?

Statistik og Near Field

- **Near field: Aldur (s/min) vind, 2D Euler+**
- **Statistisk: Acoustic modeling: Ljóðaldur (μ s-ms) machine learning.**

Framtíð á Fiskaaling

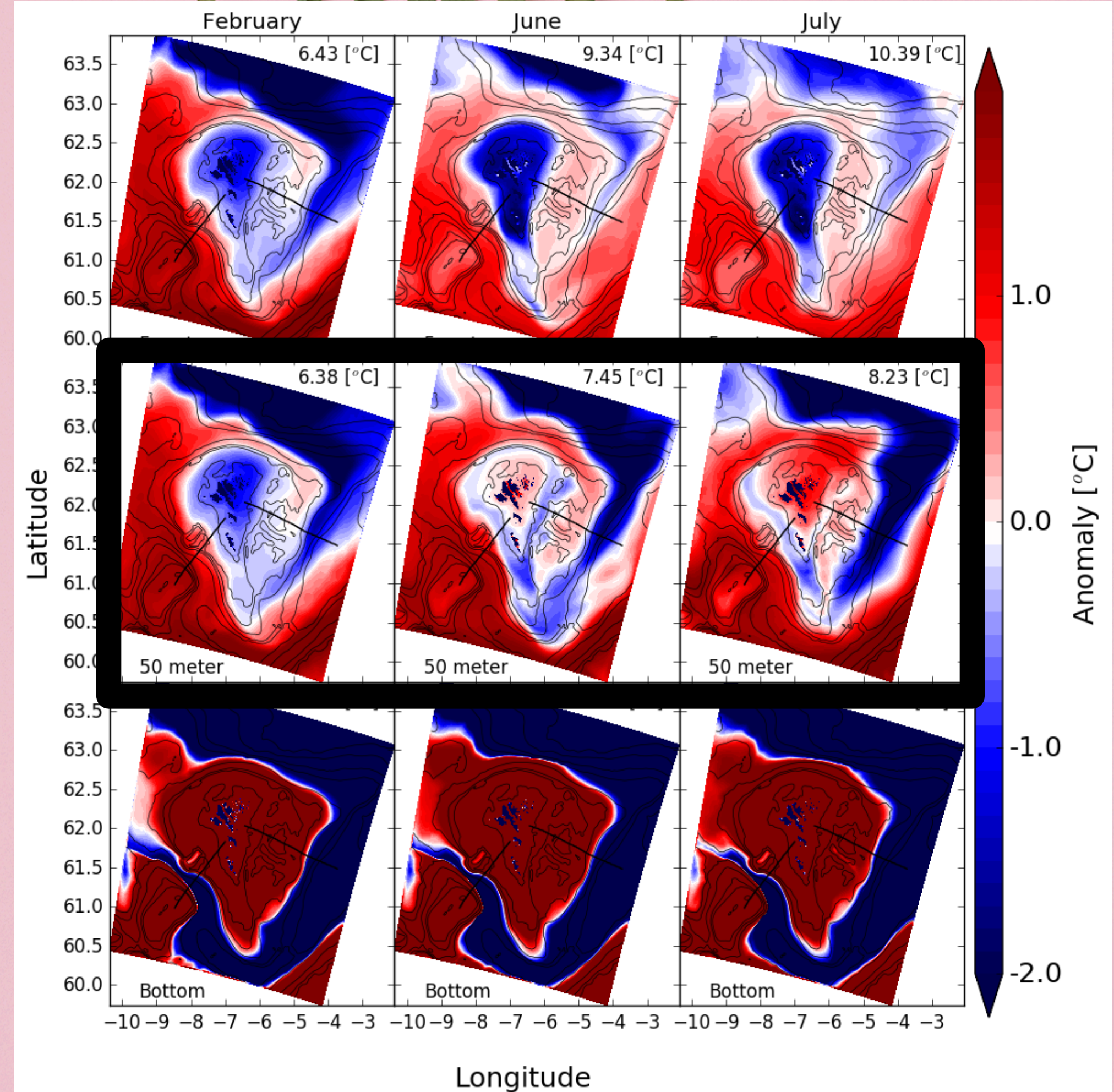
Blanding: 3D Euler+

- BioGeoChemical modeling,
- Algur, Bakteriur, Spjaðing av kemiskum evnum, eDNA?
- Sekund / minuttir / dagar

Hvar nýta vit tað á Fiskaaling?

Euler / Far-field 3D model

- FarCoast model set up:
- 3D Eulerian hydrodynamisk model (ROMS)
- FarCoast800: À Landgrunninum
- Hvar kemur vatnið inn á Landgrunnin, áðrenn tað kemur inn á firðirnar?
- FarCoast32: Inn á firðirnar
- Hvussu kemur vatnið inn í firðirnar



Erenbjerg, S. V., Albretsen, J., Simonsen, K., Sandvik, A. D., & Kaas, E. (2020). A step towards high resolution modeling of the central Faroe shelf circulation by FarCoast800. *Regional Studies in Marine Science*, 40, 101475. <https://doi.org/10.1016/j.rsm.2020.101475>

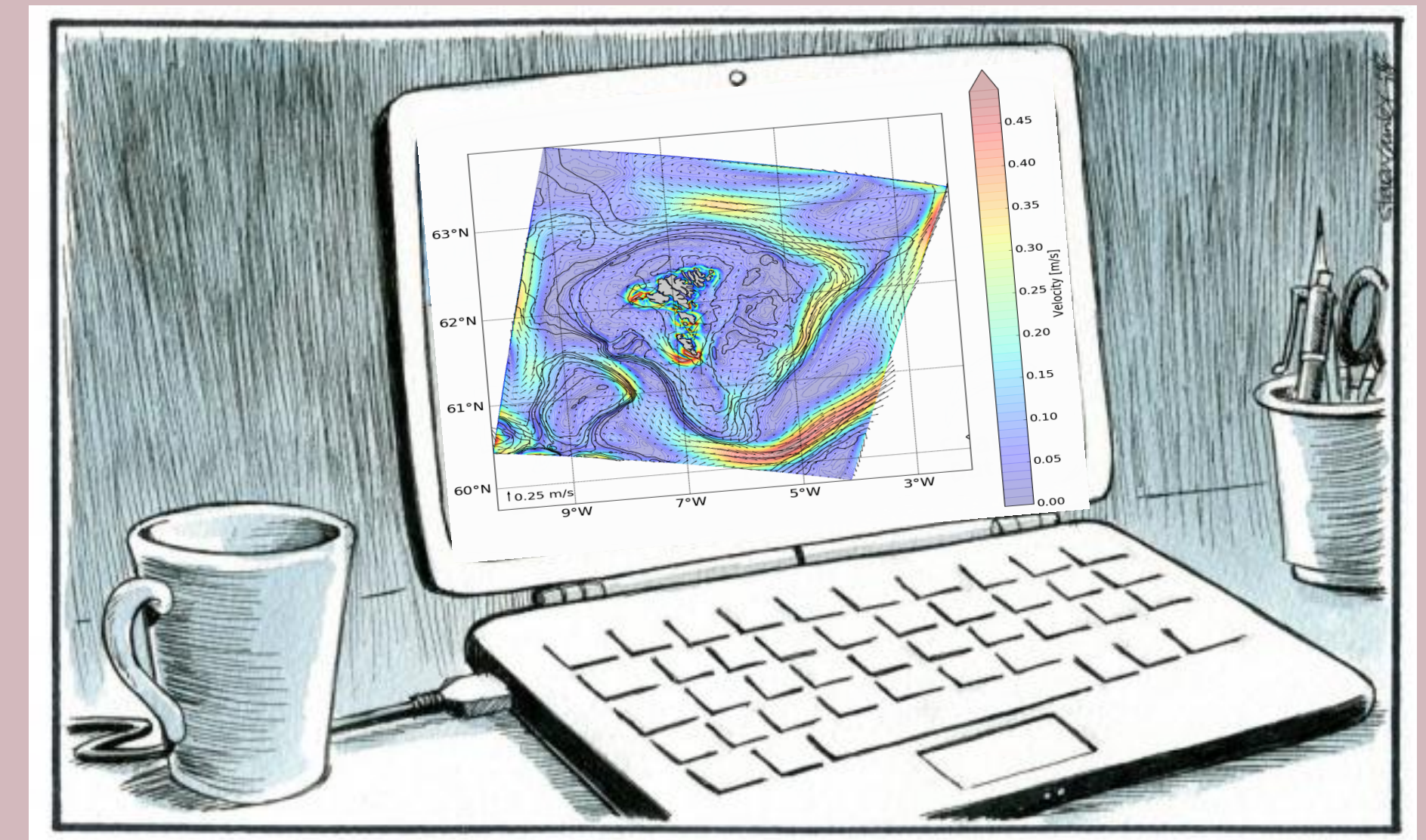
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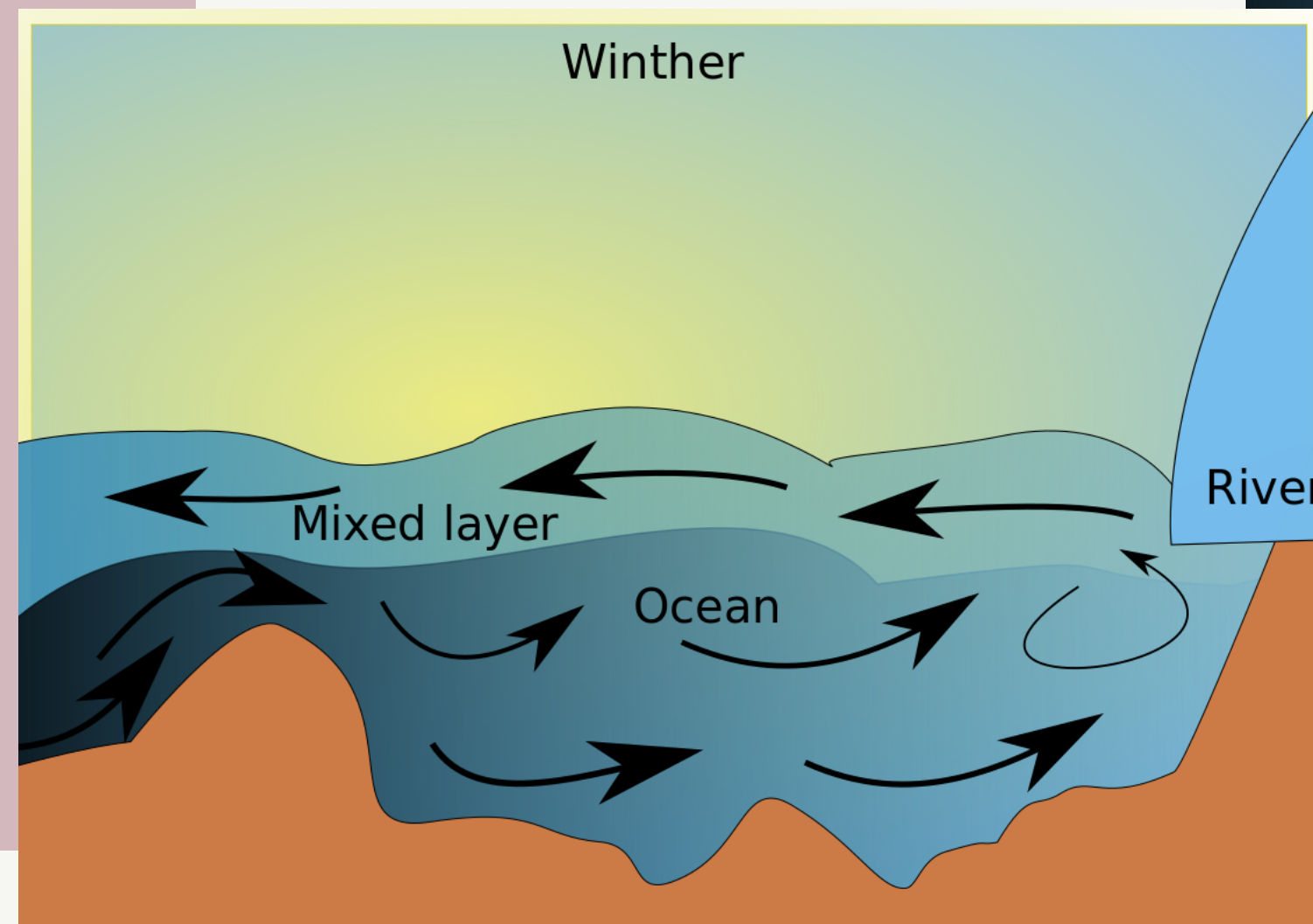
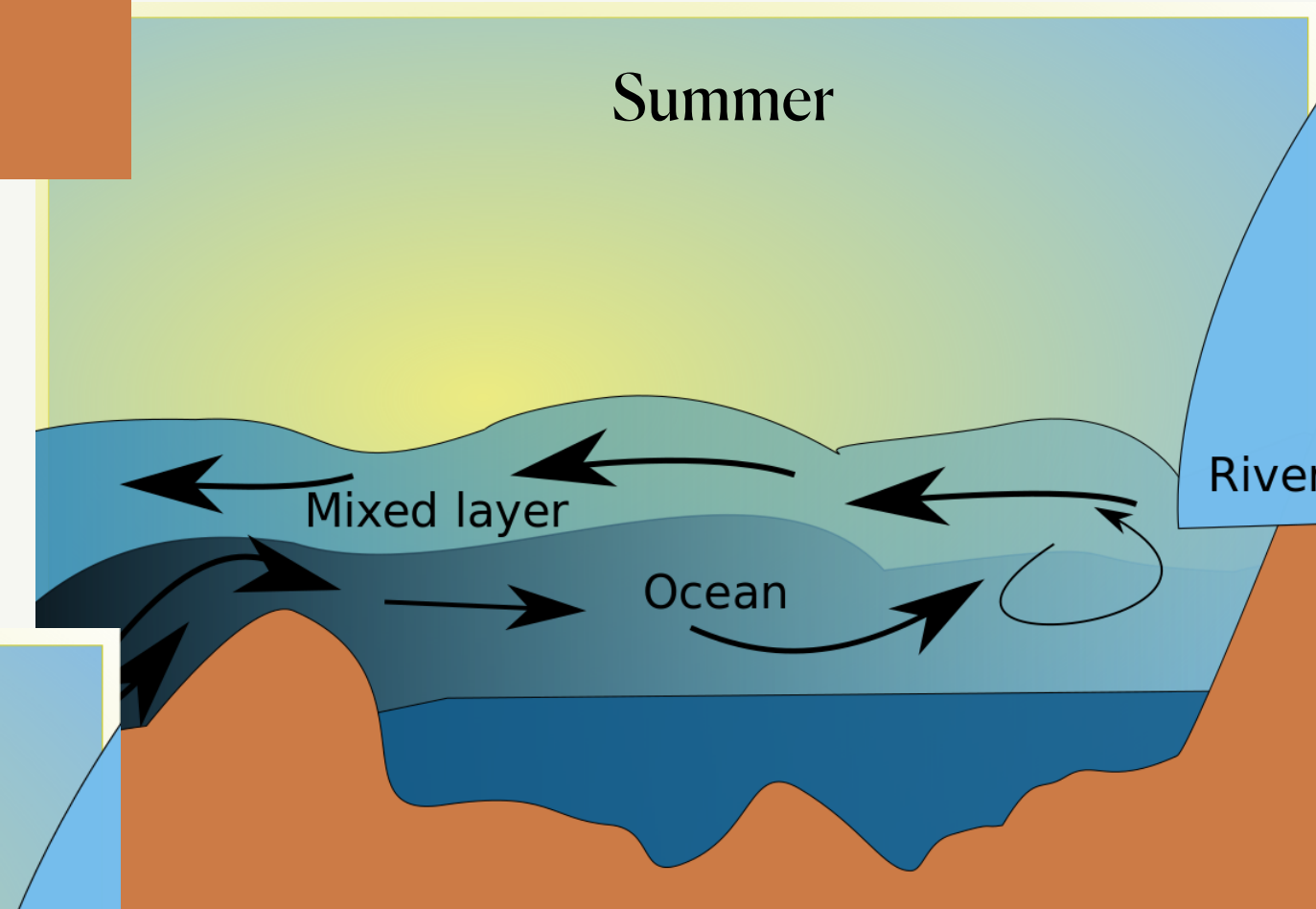
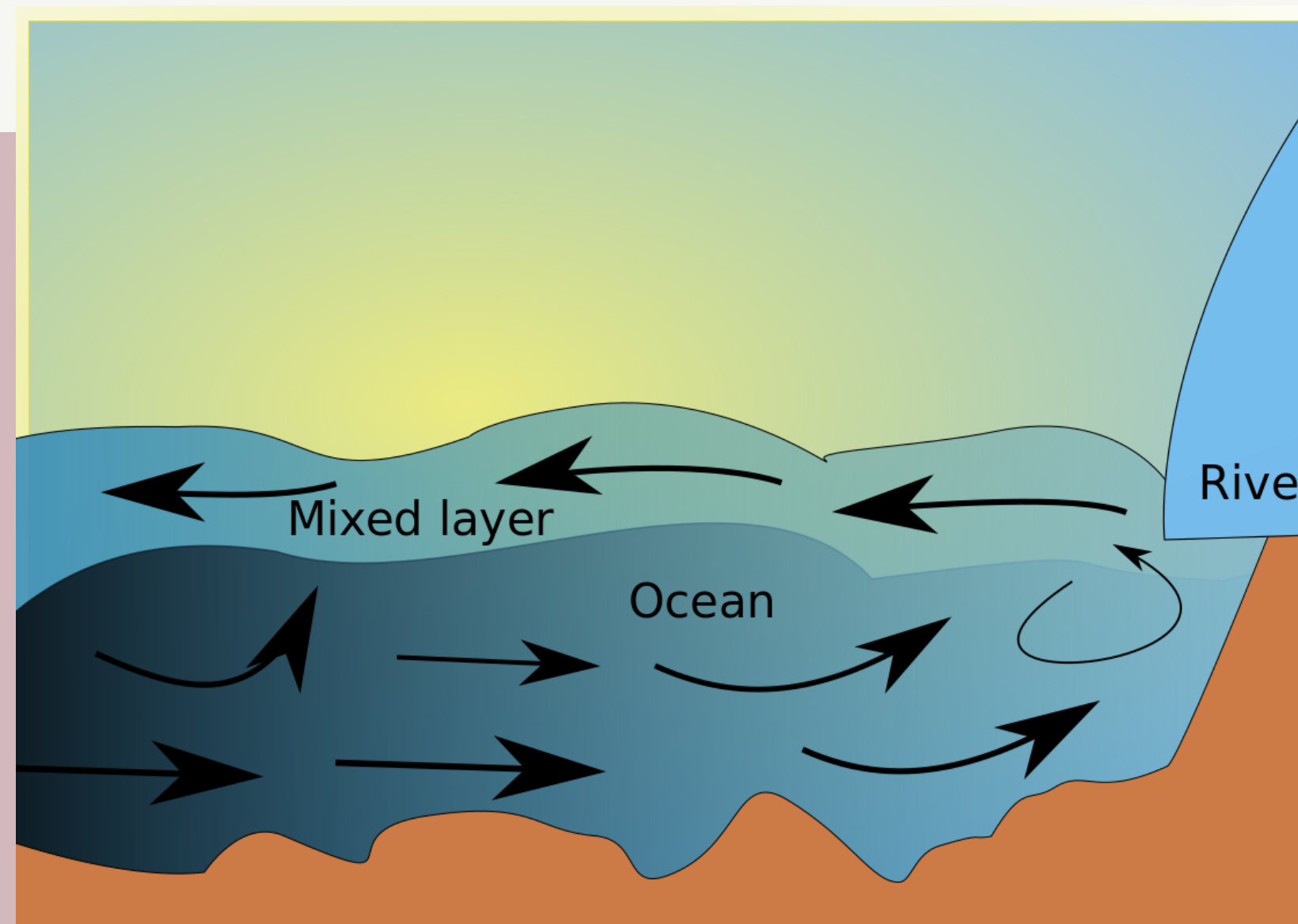
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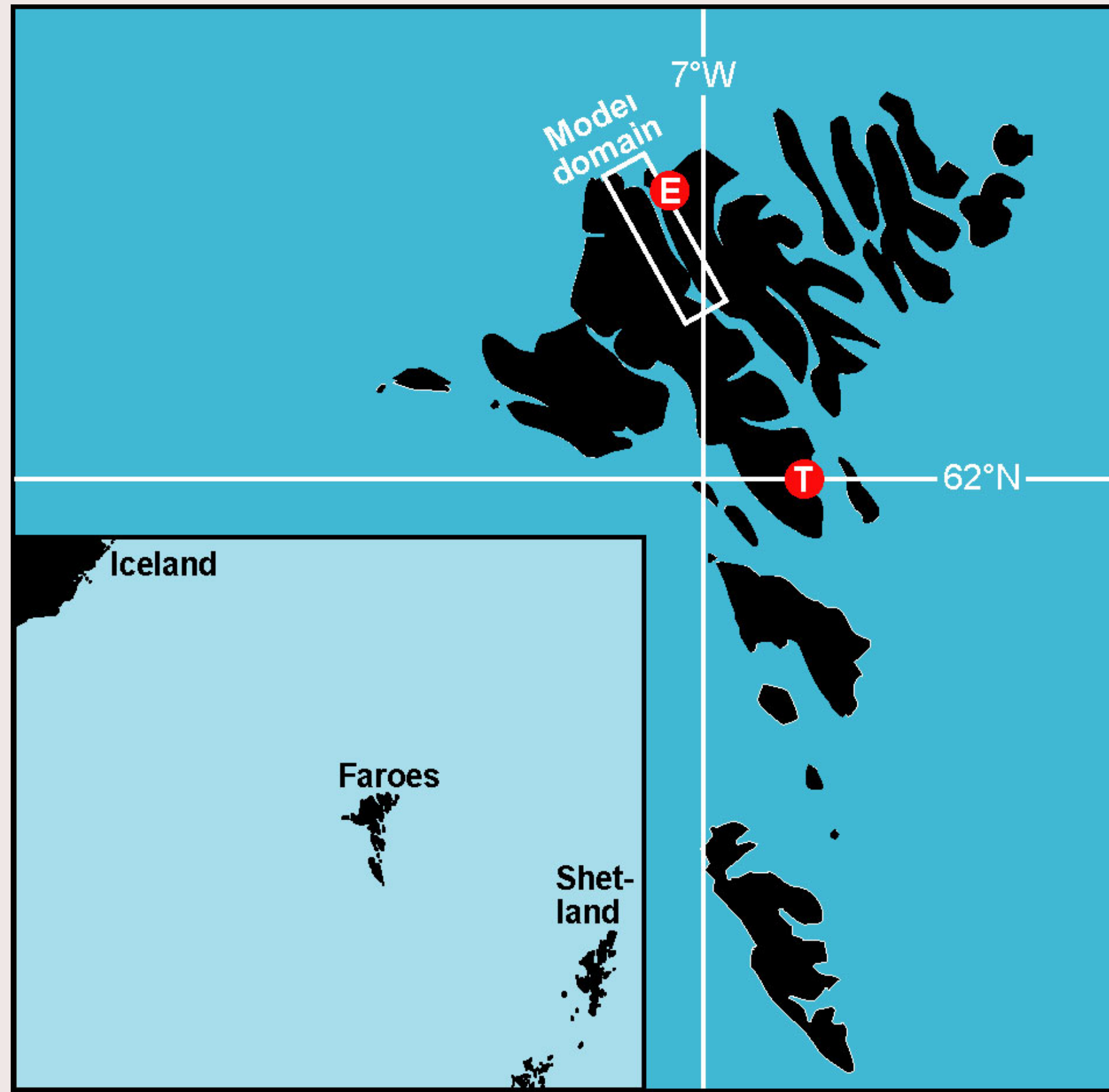
Útskipting?

Hevur týdning fyri gáttafirðir

td. Sundalagið norður, Kaldbaksfjørður og Skálafjørður

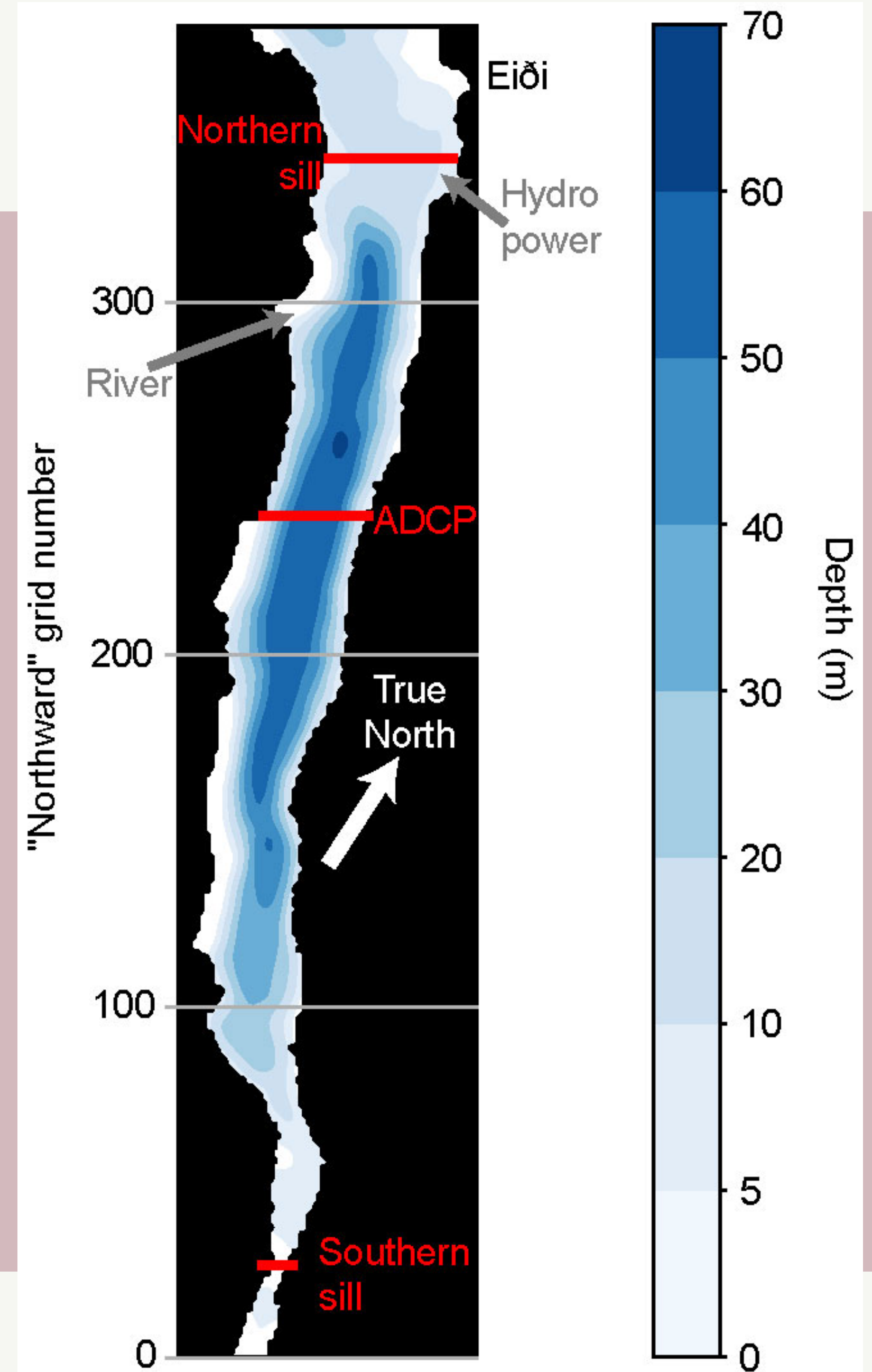


Sundalagið norður, ein gáttafjørður

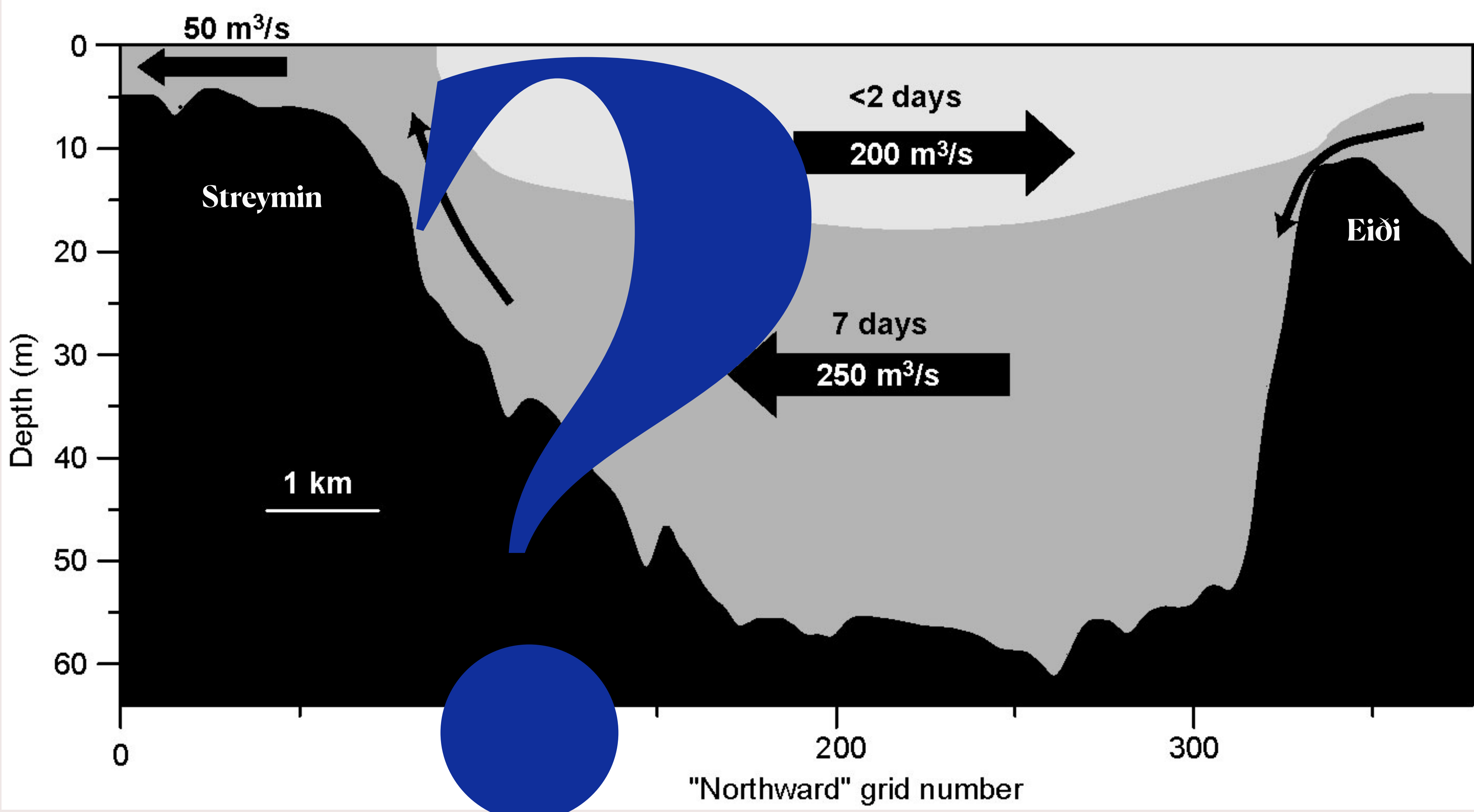


- FarCoast32: Simulering 4 vikur Feb-Mars 2013

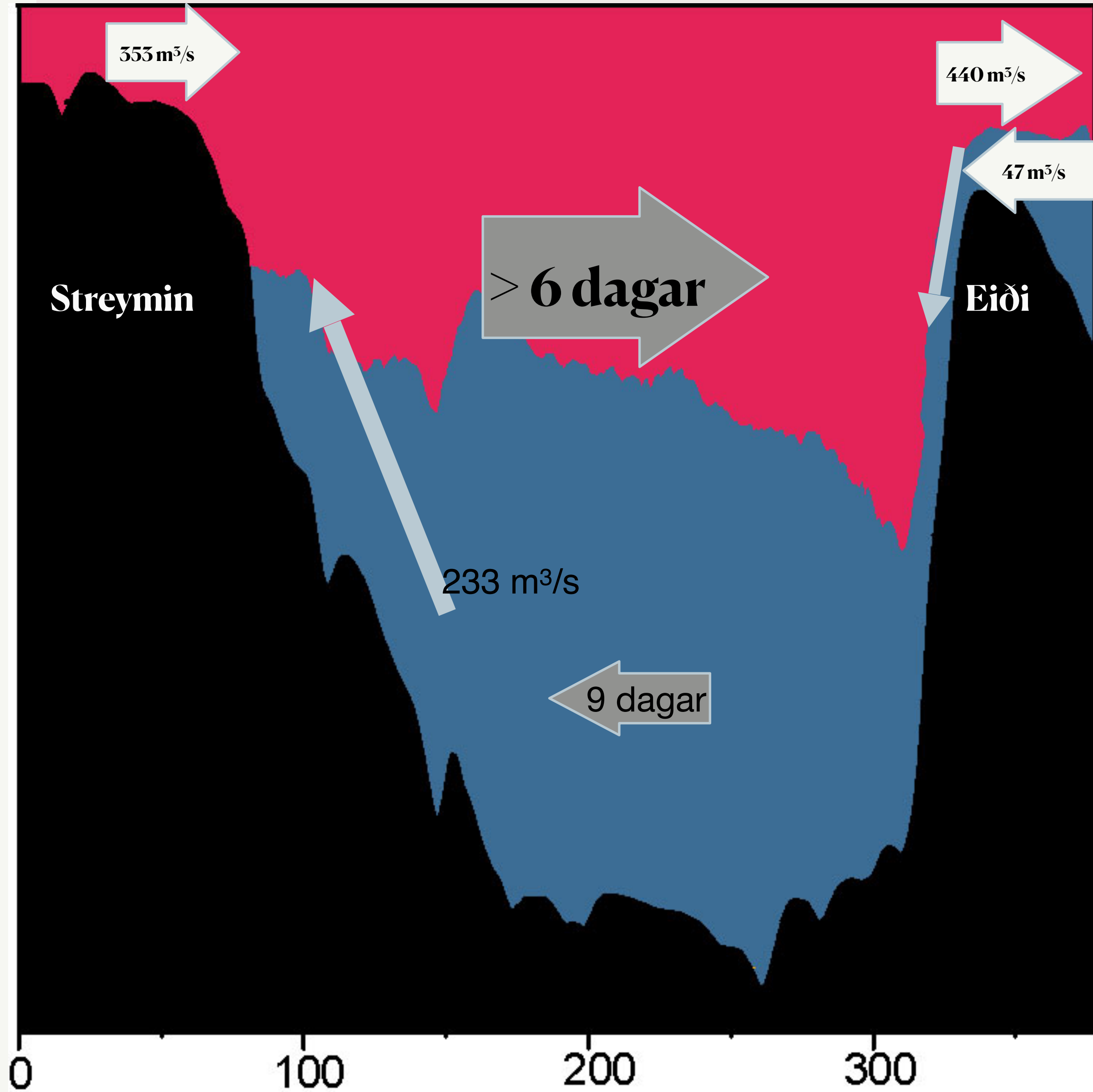
In prep. Erenbjerg, S. V., Albretsen, J., Simonsen, K., Olsen, E., & Kaas, E. & Hansen, B., Tidally driven mixing in an Estuary.



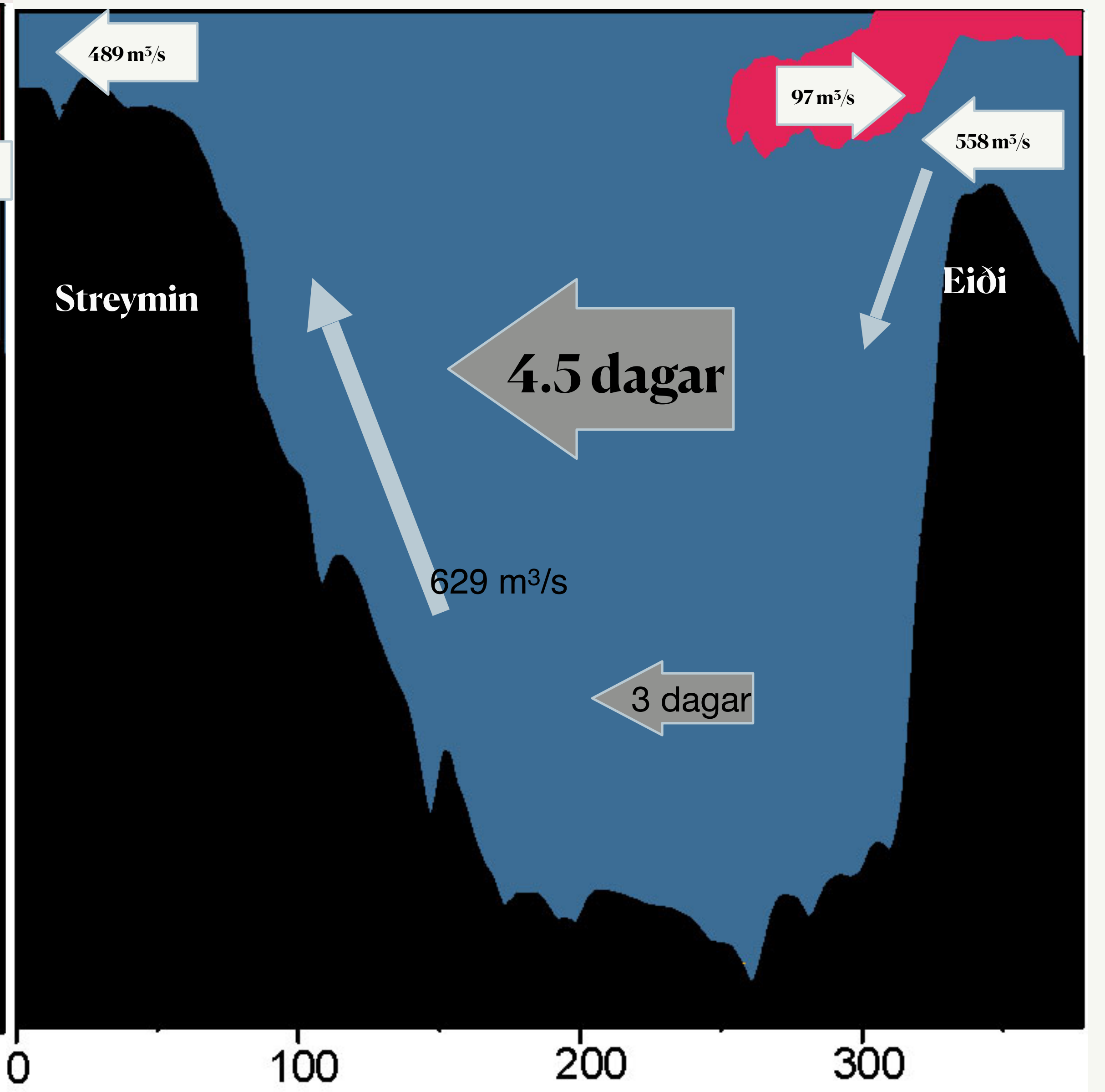
Sundalagið norður, ein gáttafjørður, øll periodan



Vika 1



Vika 2





Statoil



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Fiskaaling

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