

Sjávarútvegurinn og breytingar í hafinu

Sjávarútvegsráðstefnan 2014

Grand Hótel - Reykjavík - 20.-21. nóvember

Hrönn Egilsdóttir

Hvernig hafa athafnir manna áhrif á hafsvæði?

Koldíoxíð (CO_2)



Flutningur
tegunda



Rusl

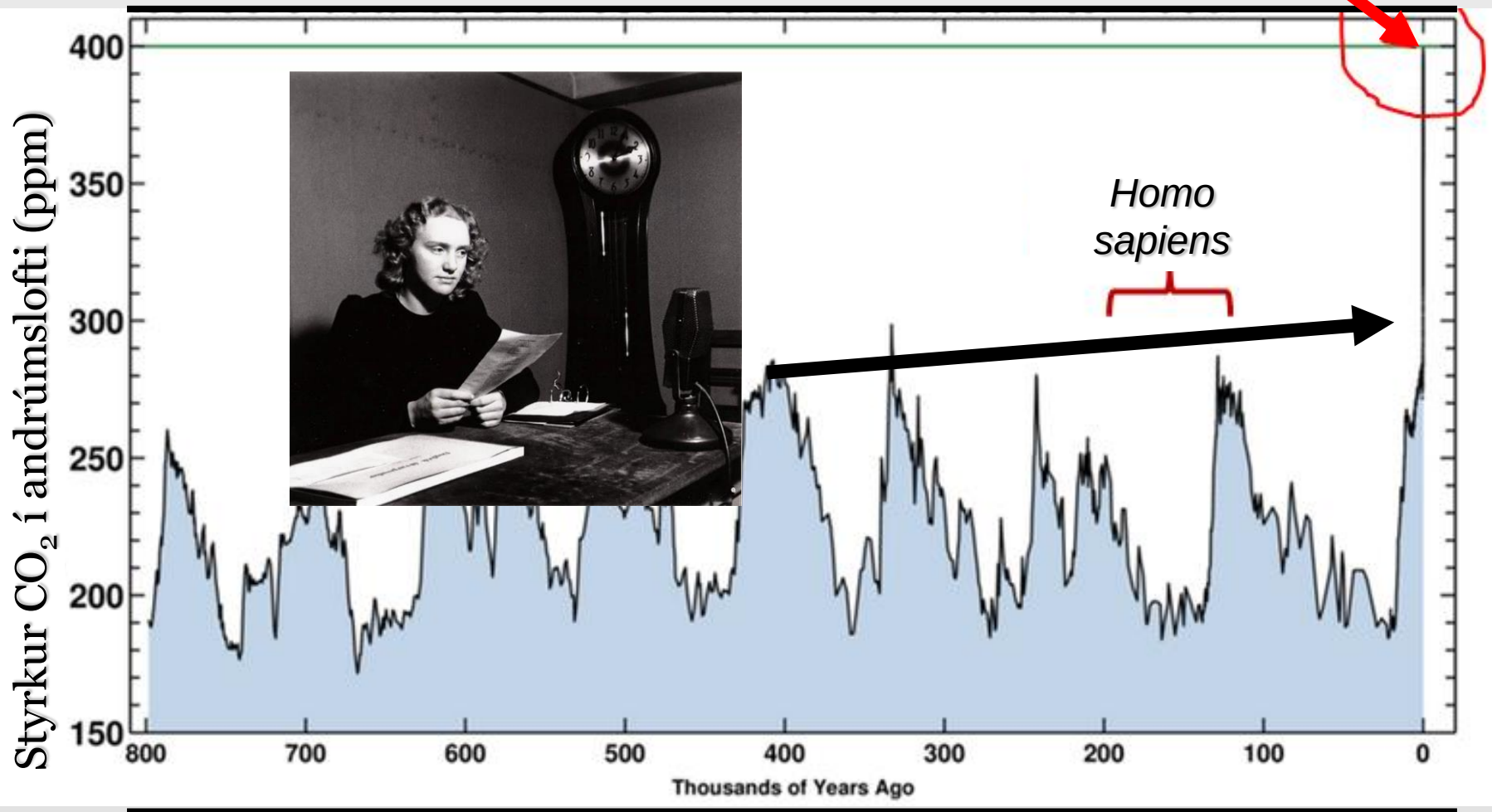


Ýmis mengun



CO₂ í andrúmslofti

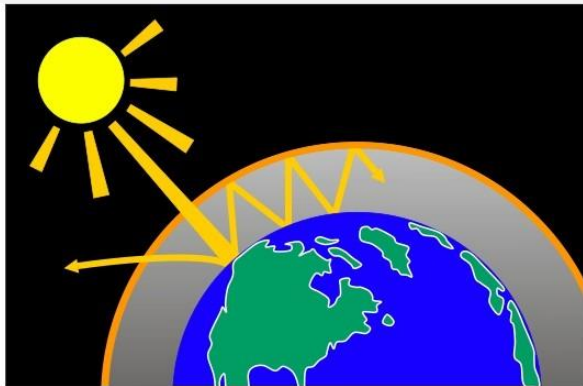
Í dag



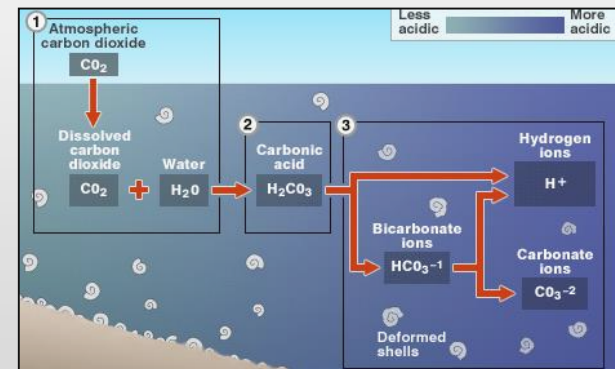
Mælingar á ískjörnum fyrir 1958. Síðar gögn frá Mouna Loa

Áhrif koldíoxíðs (CO_2) eru tvíþætt

Aukning CO_2 í andrúmslofti eykur gróðurhúsaáhrif og leiðir til loftslagsbreytinga.



Upptaka sjávar á CO_2 hefur efnafræðileg áhrif og leiðir til súrnunar sjávar

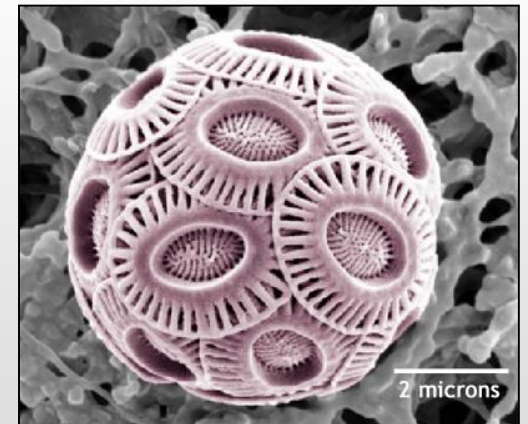


Súrnun sjávar hefur neikvæð áhrif á kalkmettun

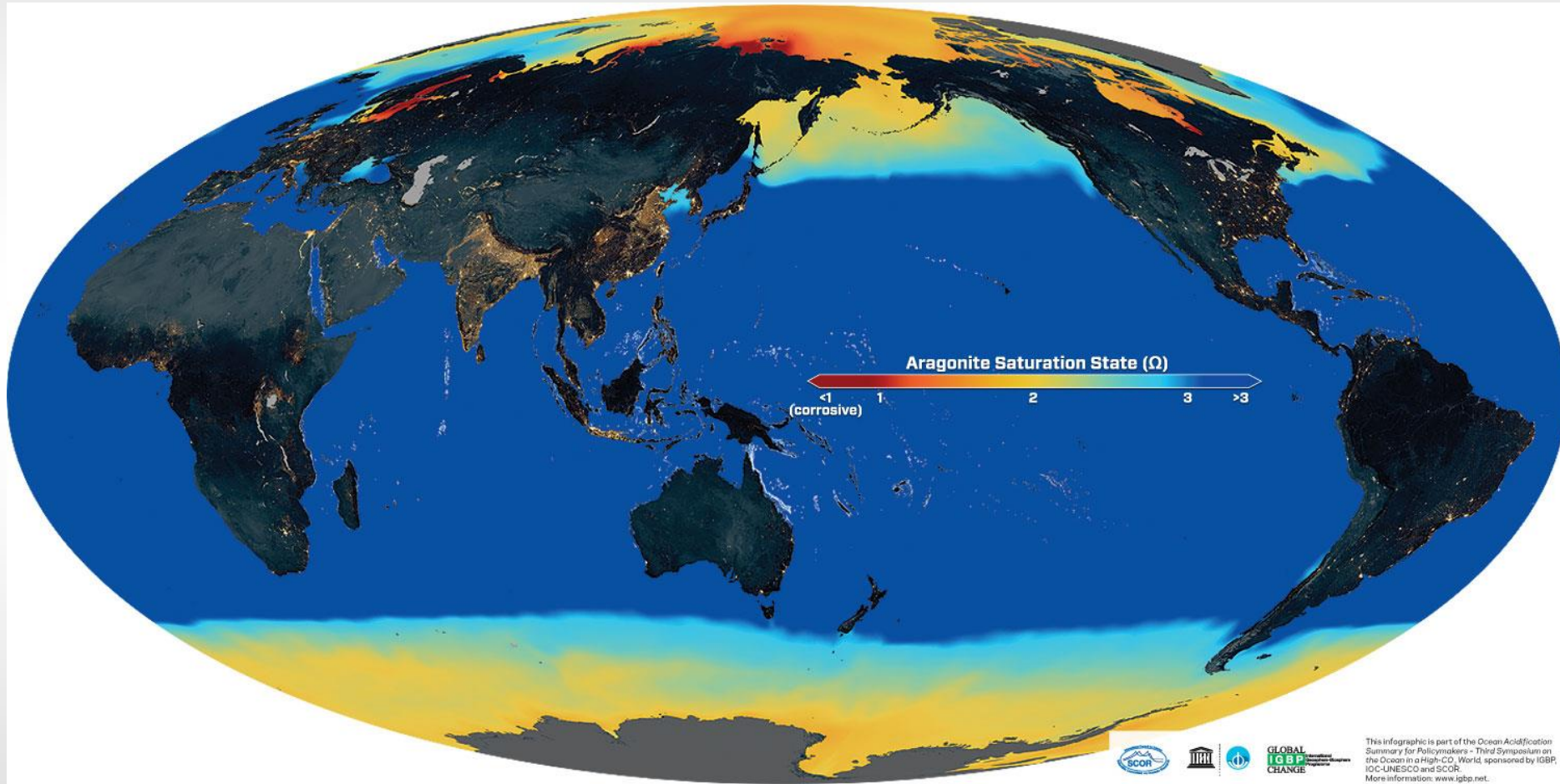
Stór hluti lífvera í hafinu framleiðir kalk.

Margar kalkmyndandi lífverur framleiða kalkgerðina **aragónít**.

Kalkmyndandi lífverur þrífast best í sjó þar sem kalk er yfirmettað.



Vegna lágs hitastigs er kalkmettun, Ω , í hafinu umhverfis Ísland lítil

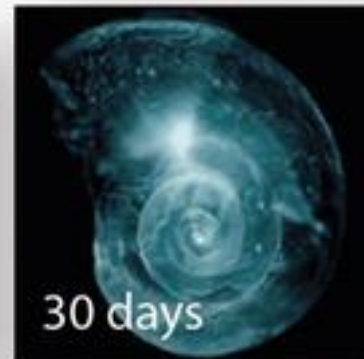


Mettun kalkgerðarinnar aragóníts við yfirborð sjávar fyrir iðnvæðingu

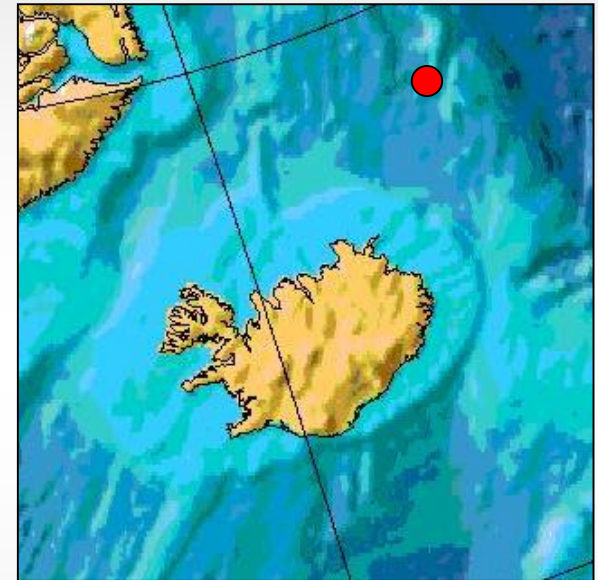
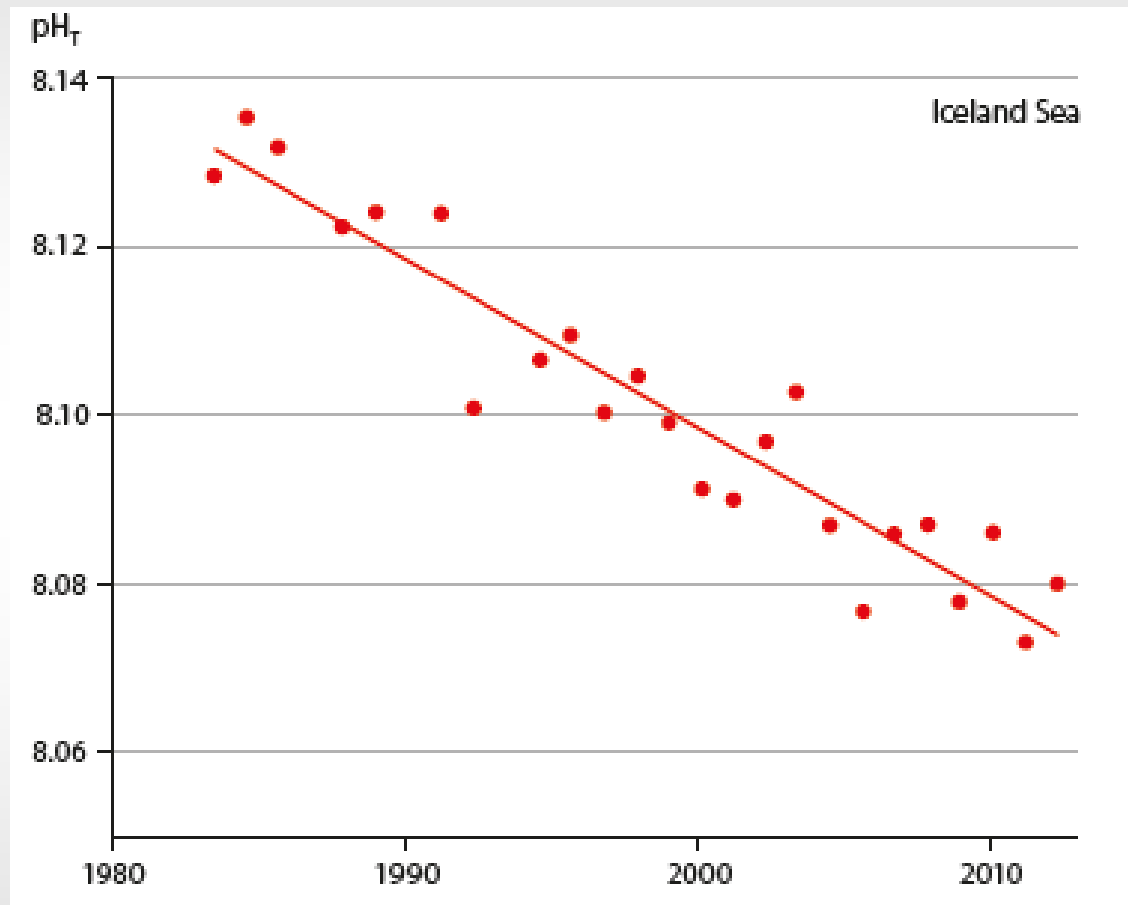
Vængjasnigillinn *Limacina helicina* myndar aragonít skel



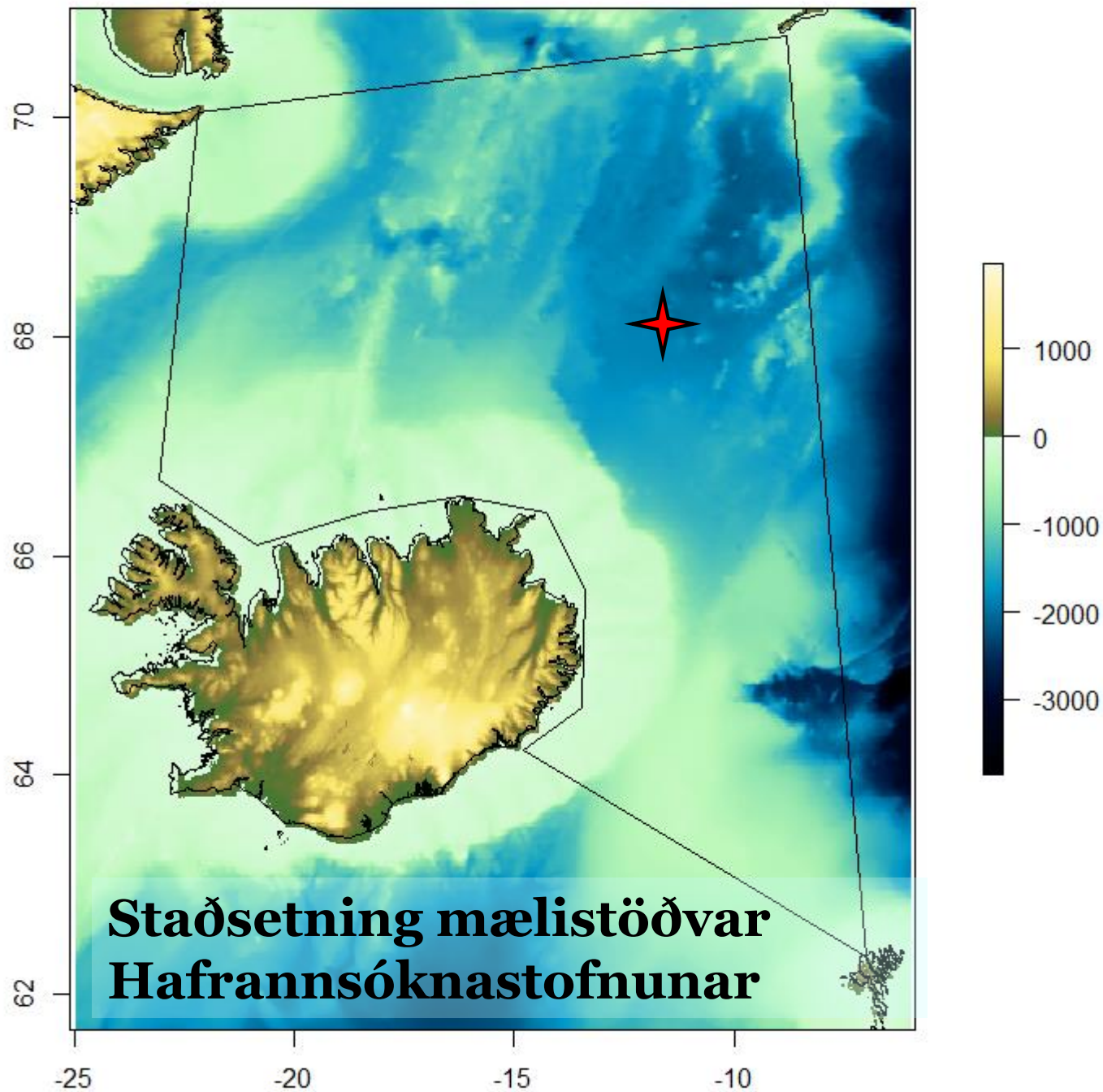
Sýnt er hvernig skelin
leysist upp í sjó sem er
undirmettaður m. t. t.
aragóníts



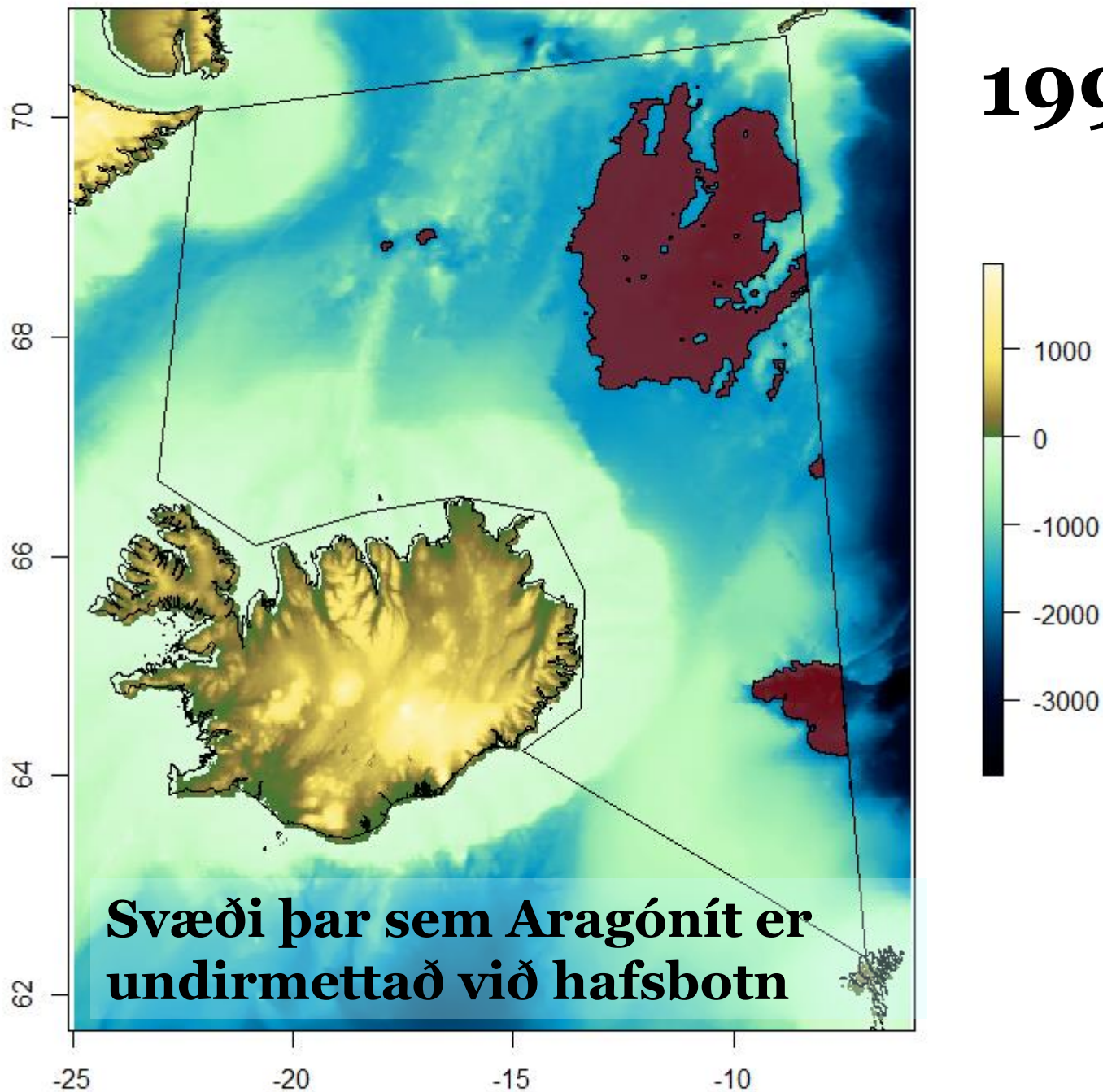
Ísland: súrnun sjávar er ótvíræð í Íslandshafi



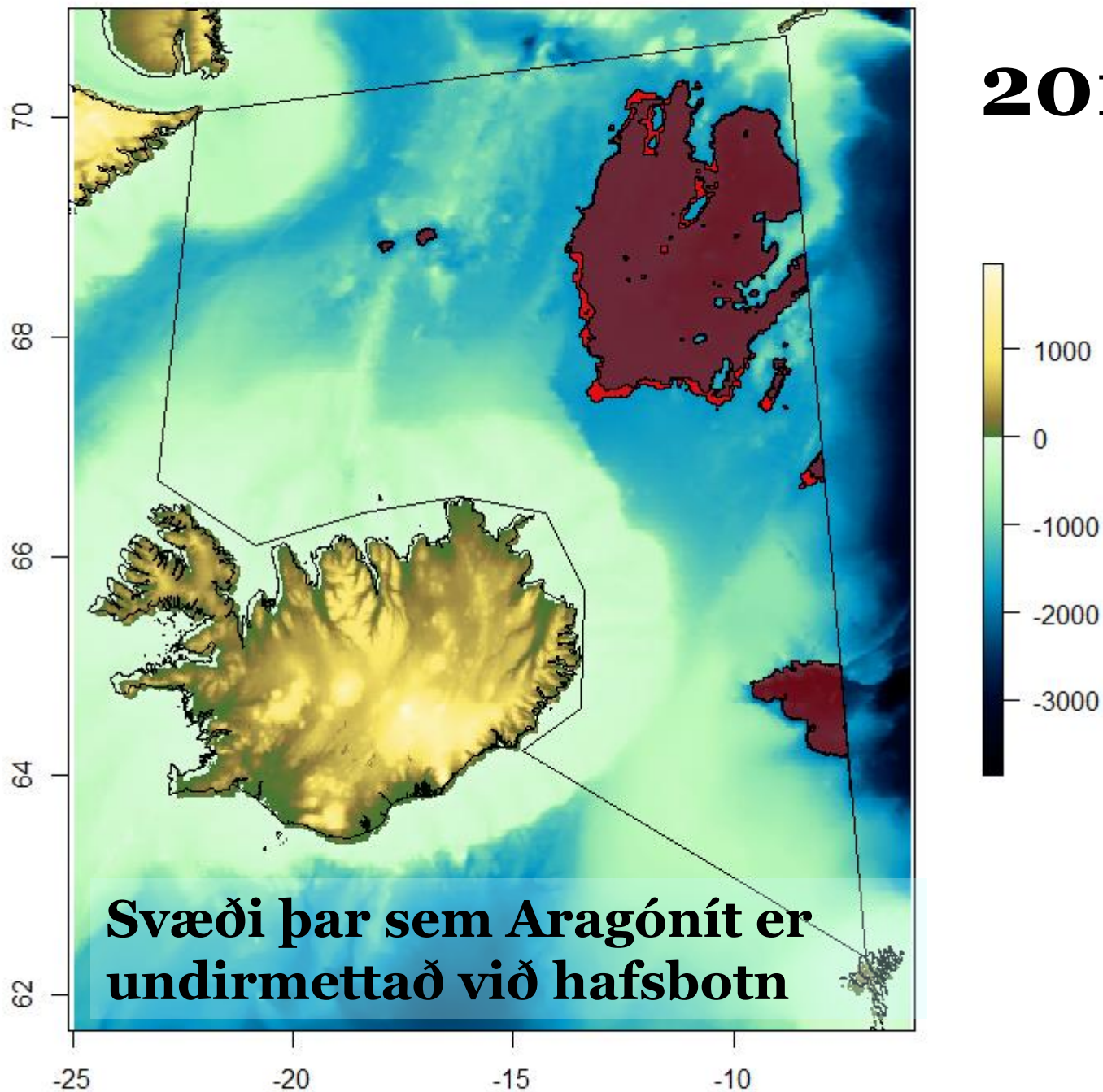
Olafsson, J., Olafsdottir S. R., Benoit-Cattin A., Danielsen M., Arnarson T. S., Takahashi T. 2009. Rate of Iceland Sea acidification from time series measurements. *Biogeosciences* 6:2661-2668



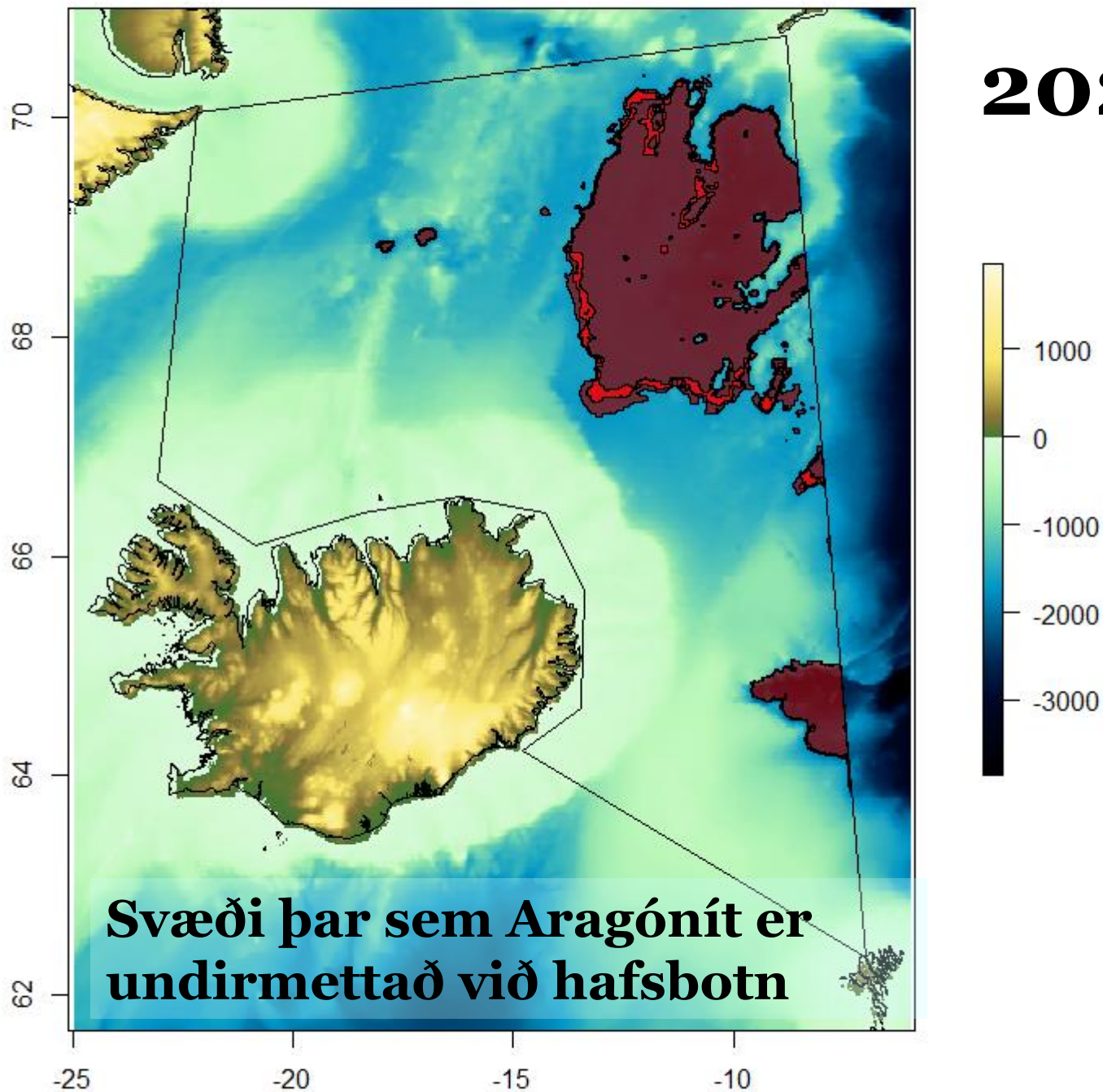
1995



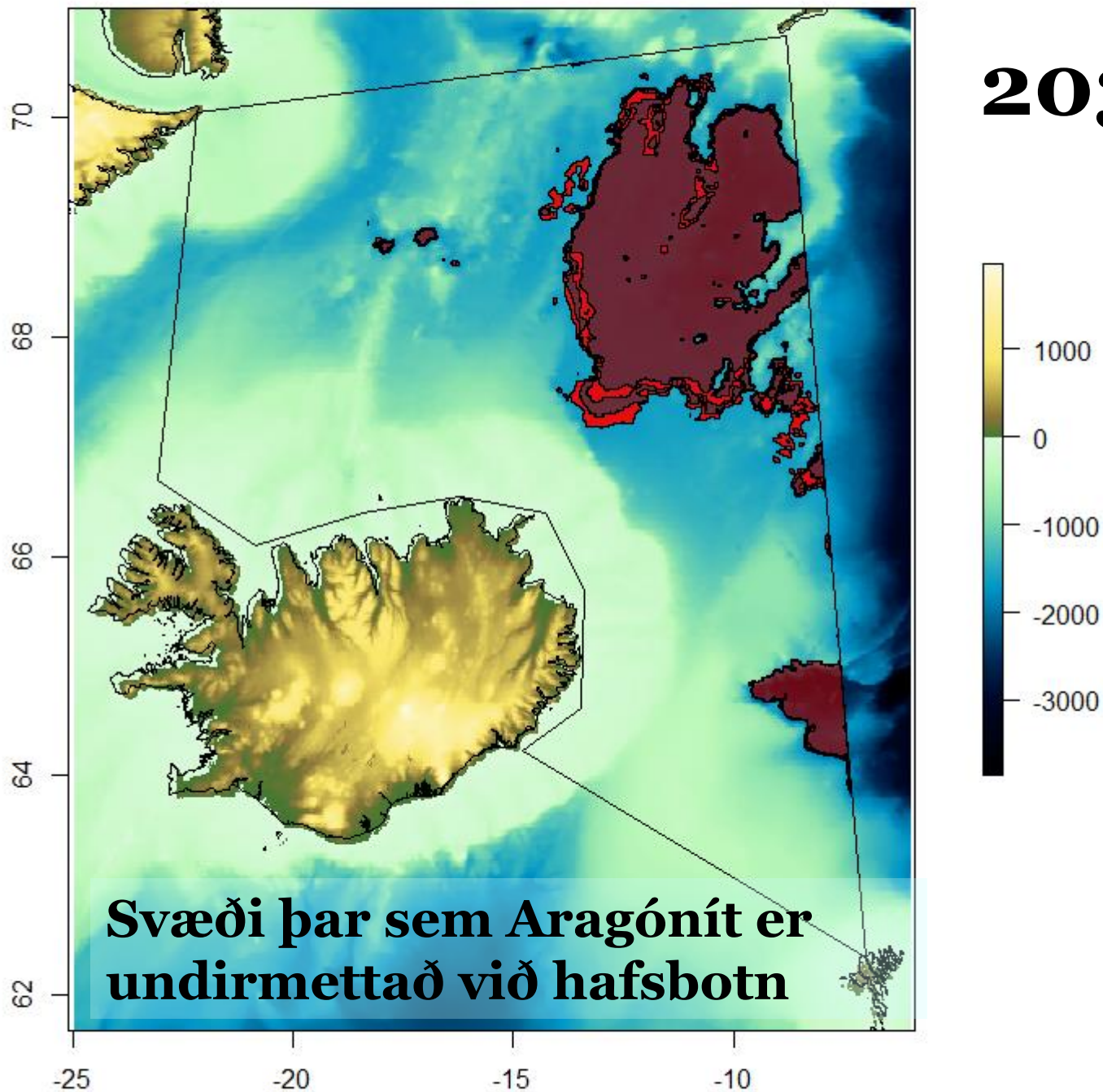
2010



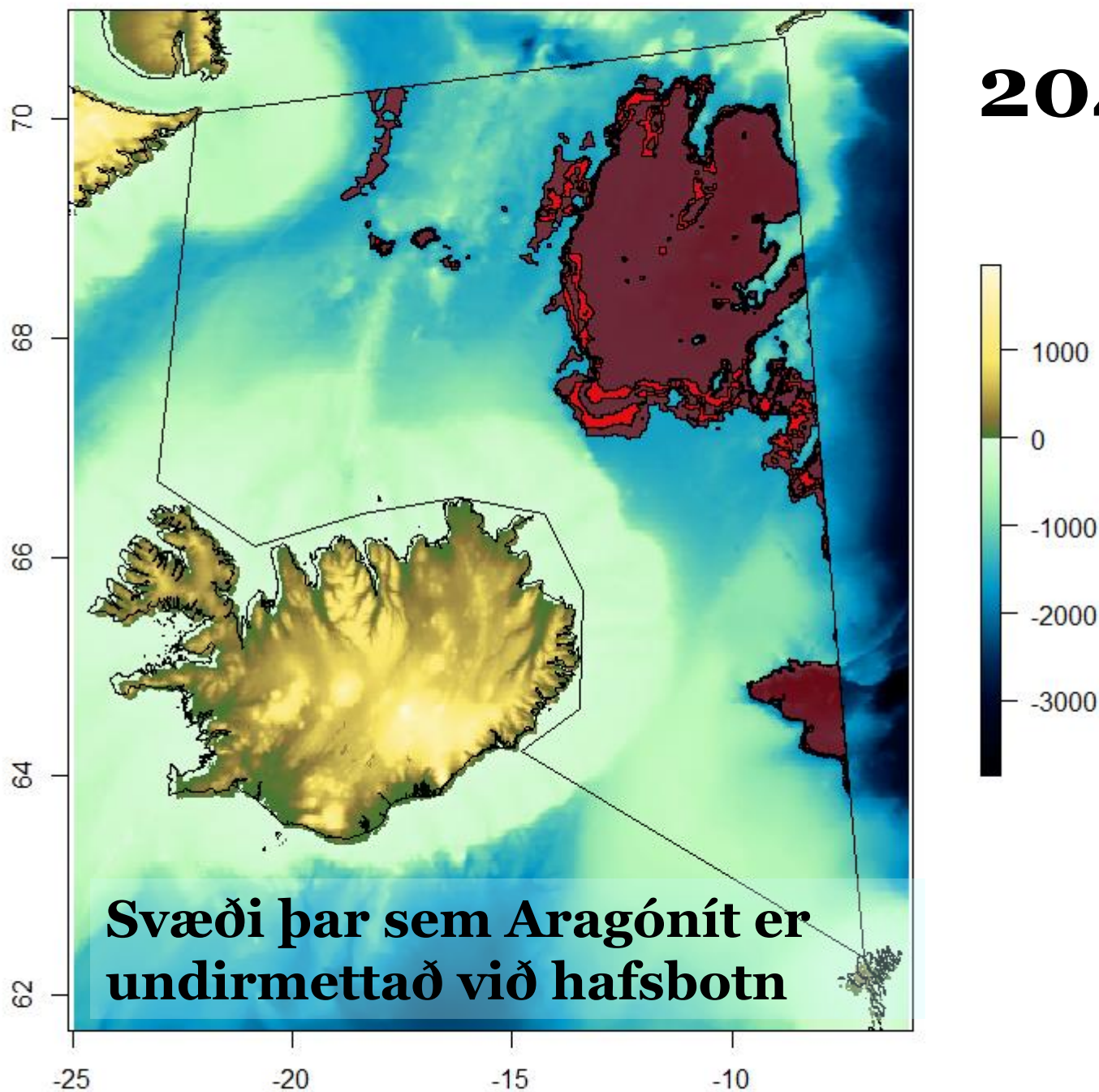
2020



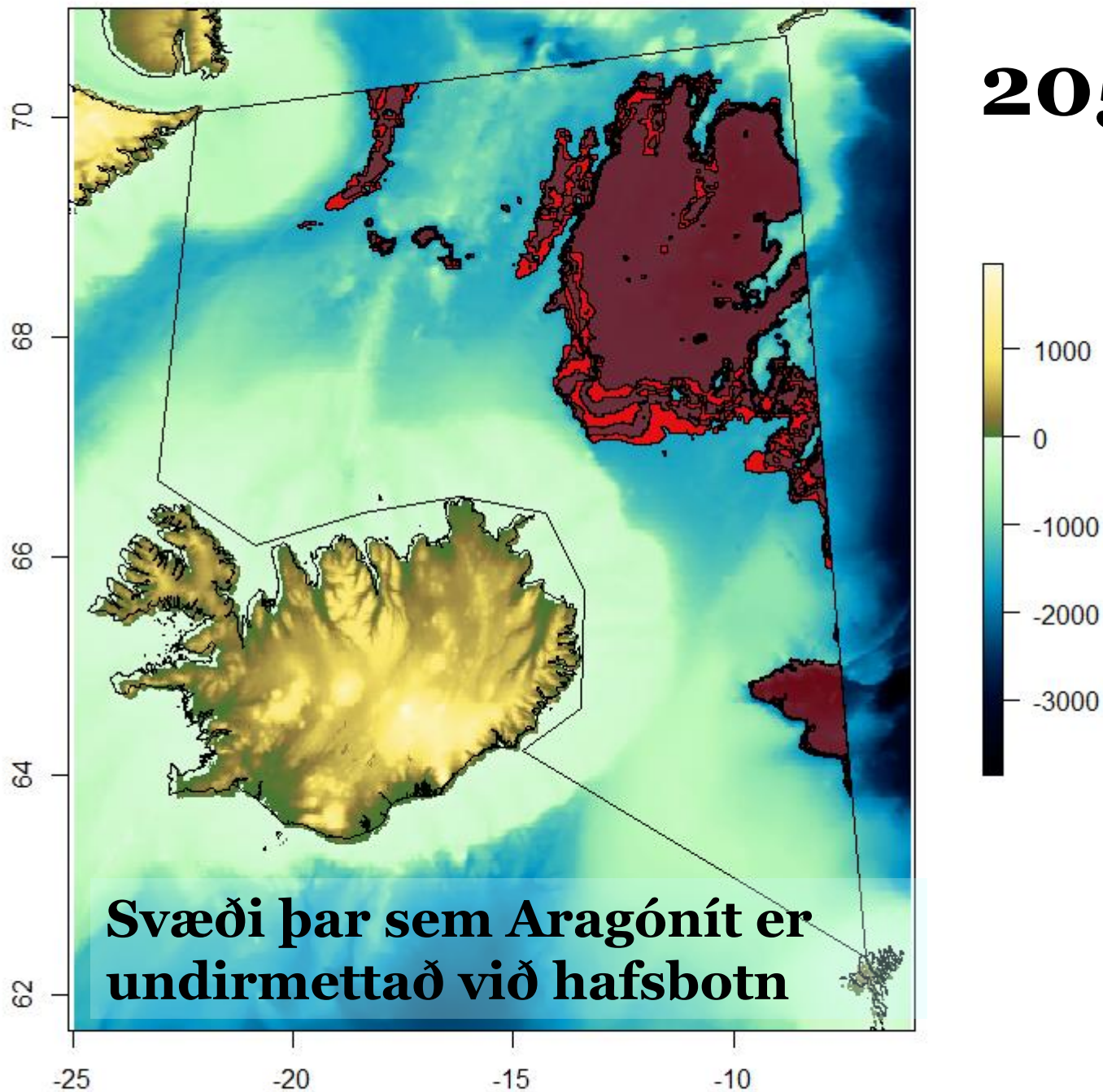
2030



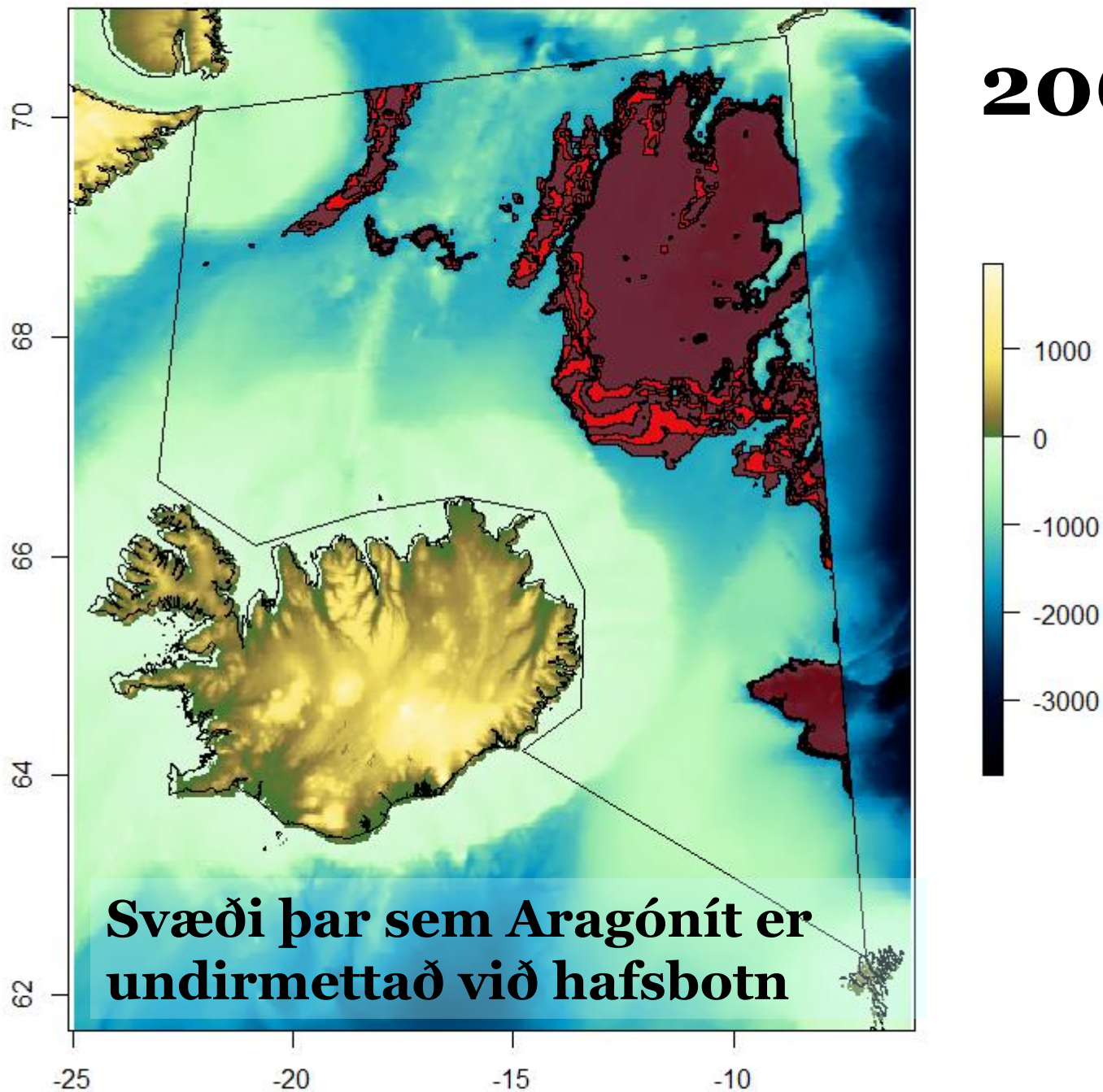
2040



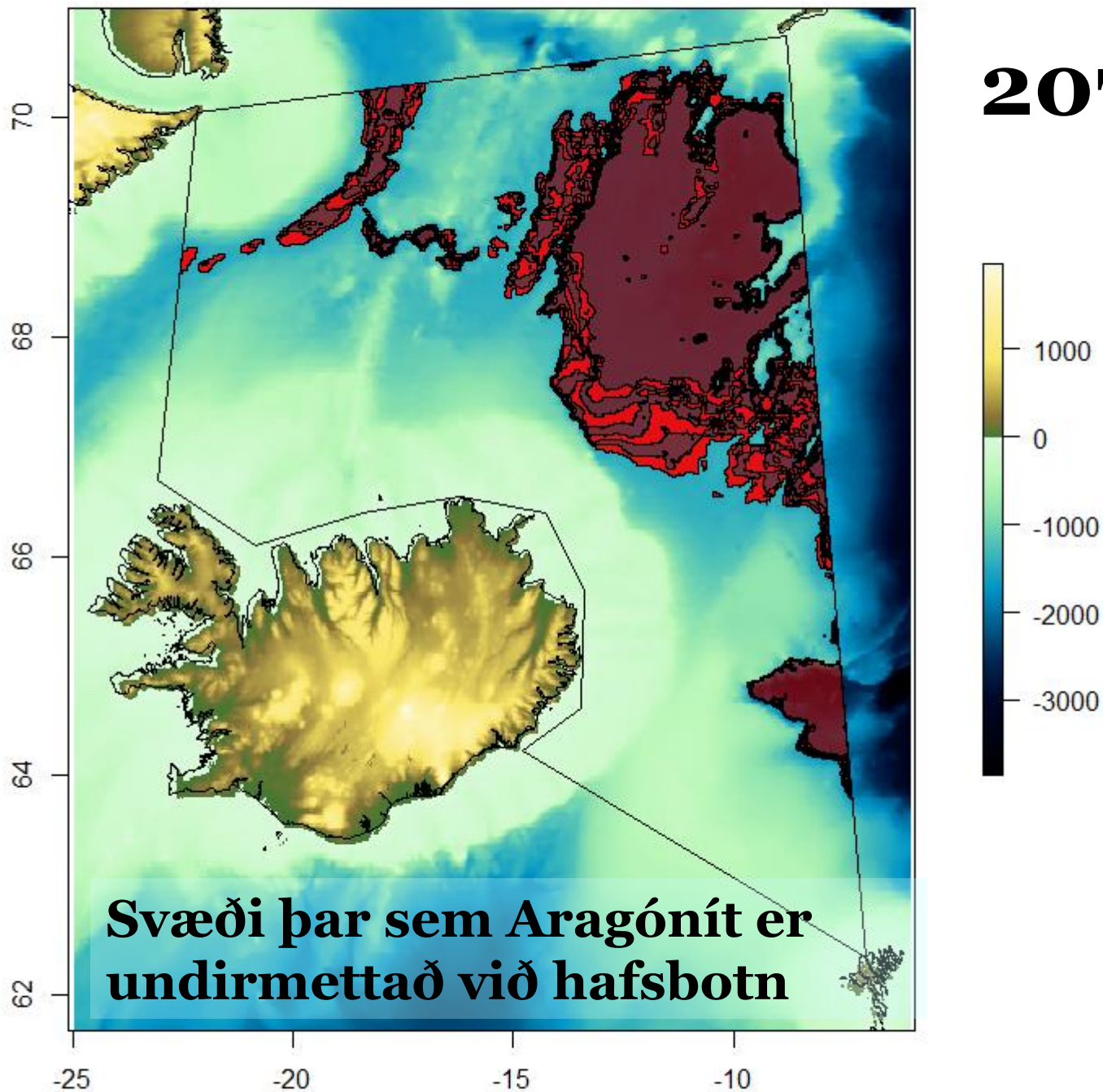
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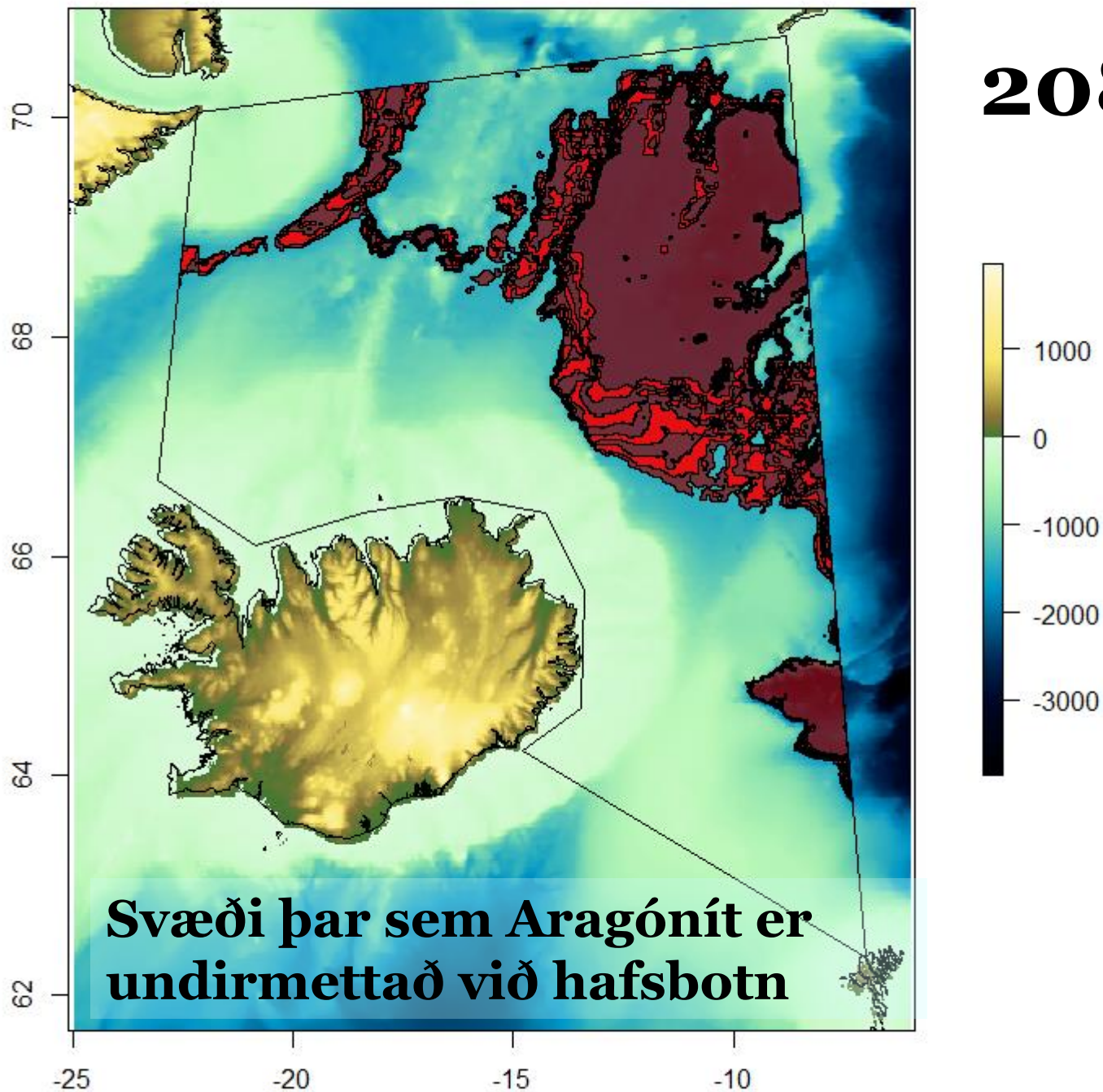
2060



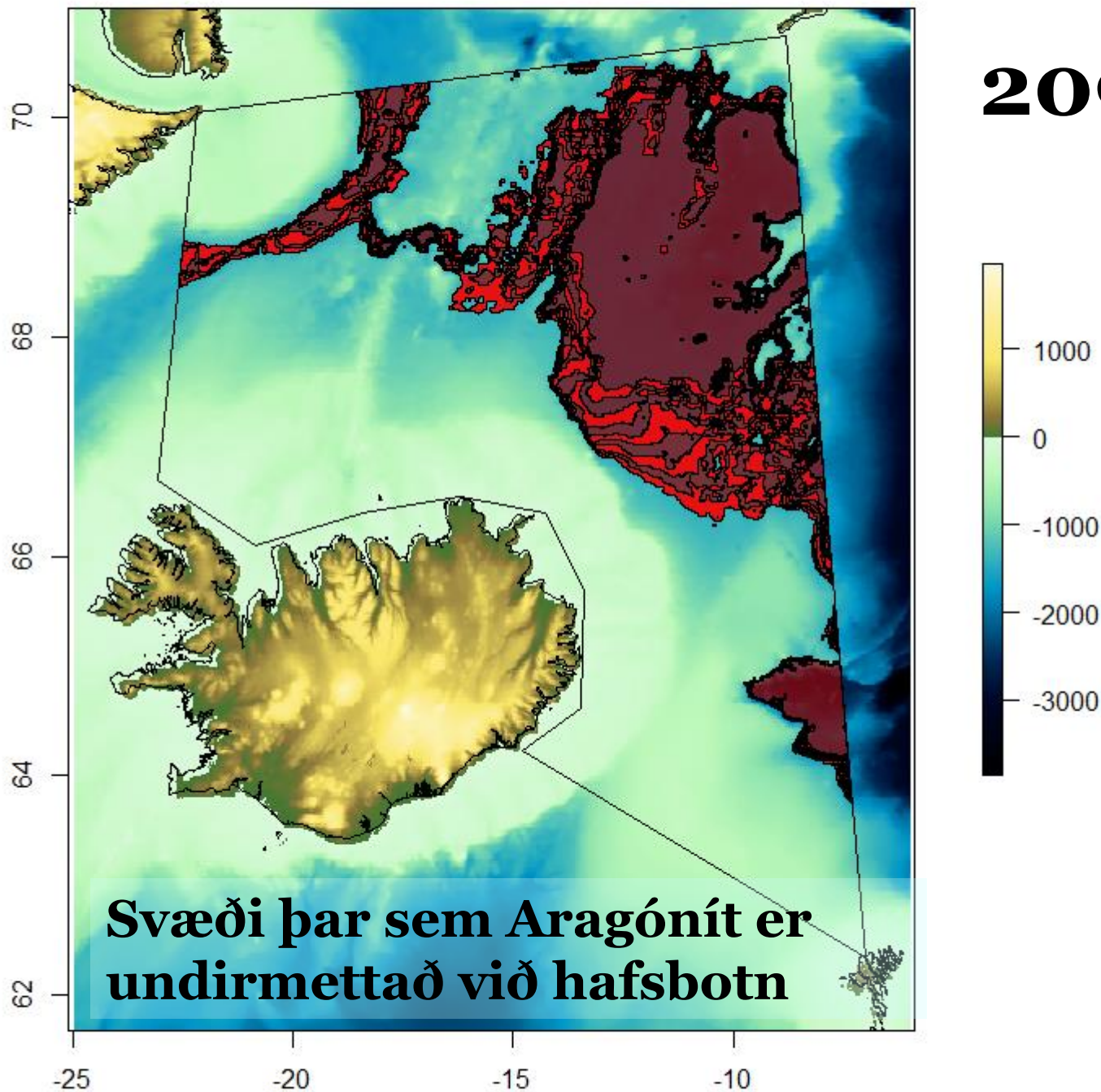
2070



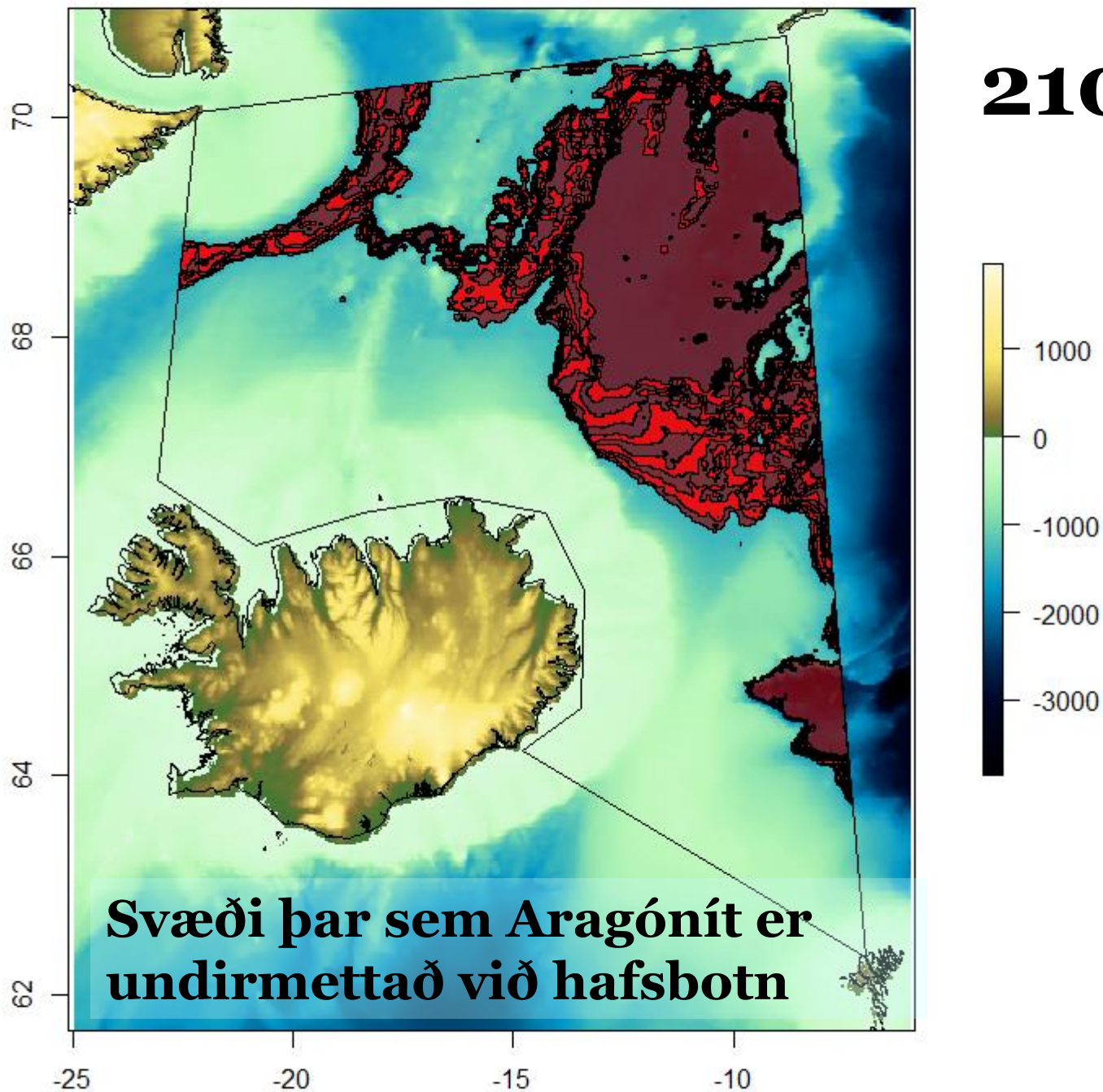
2080



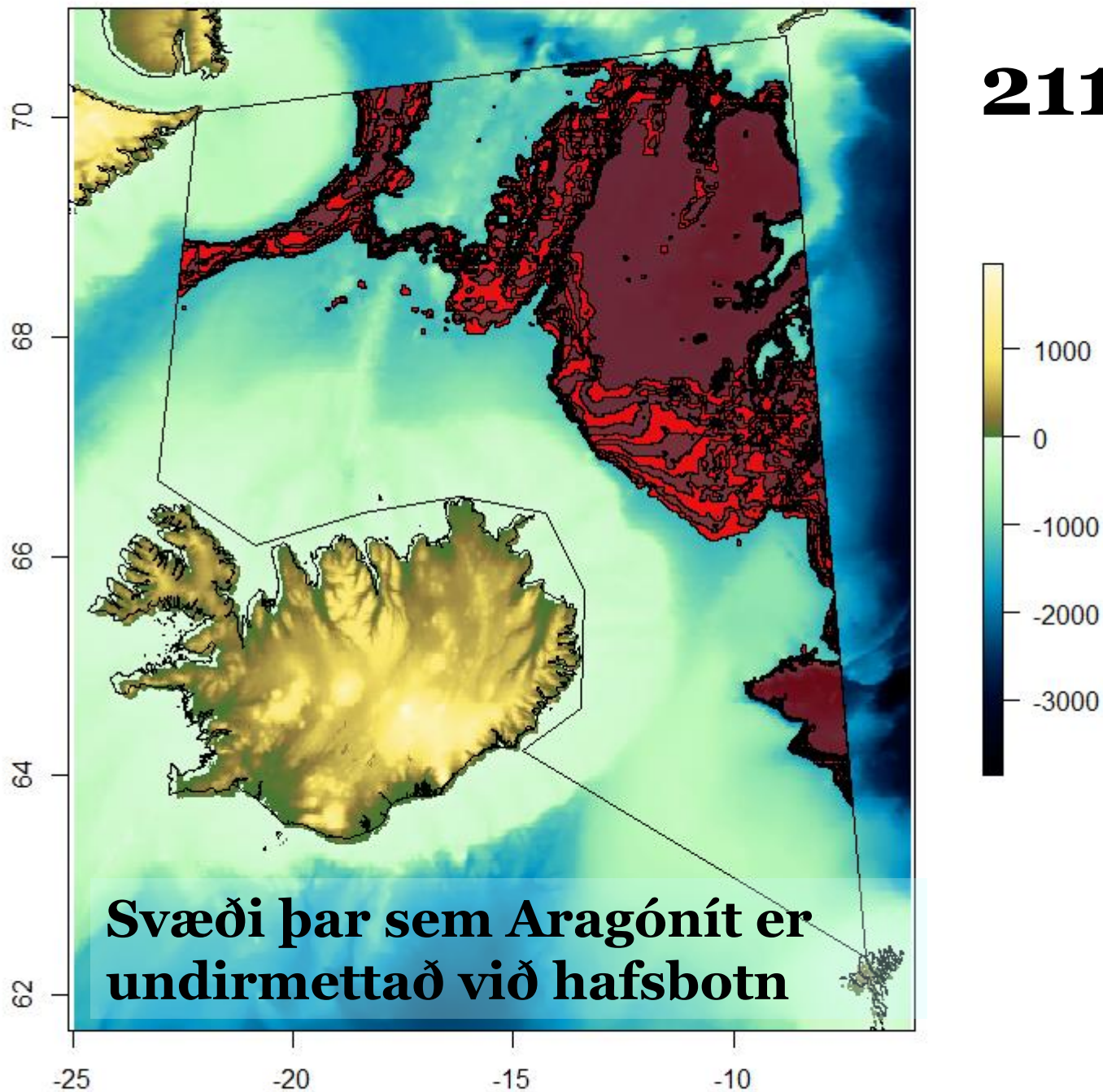
2090



2100

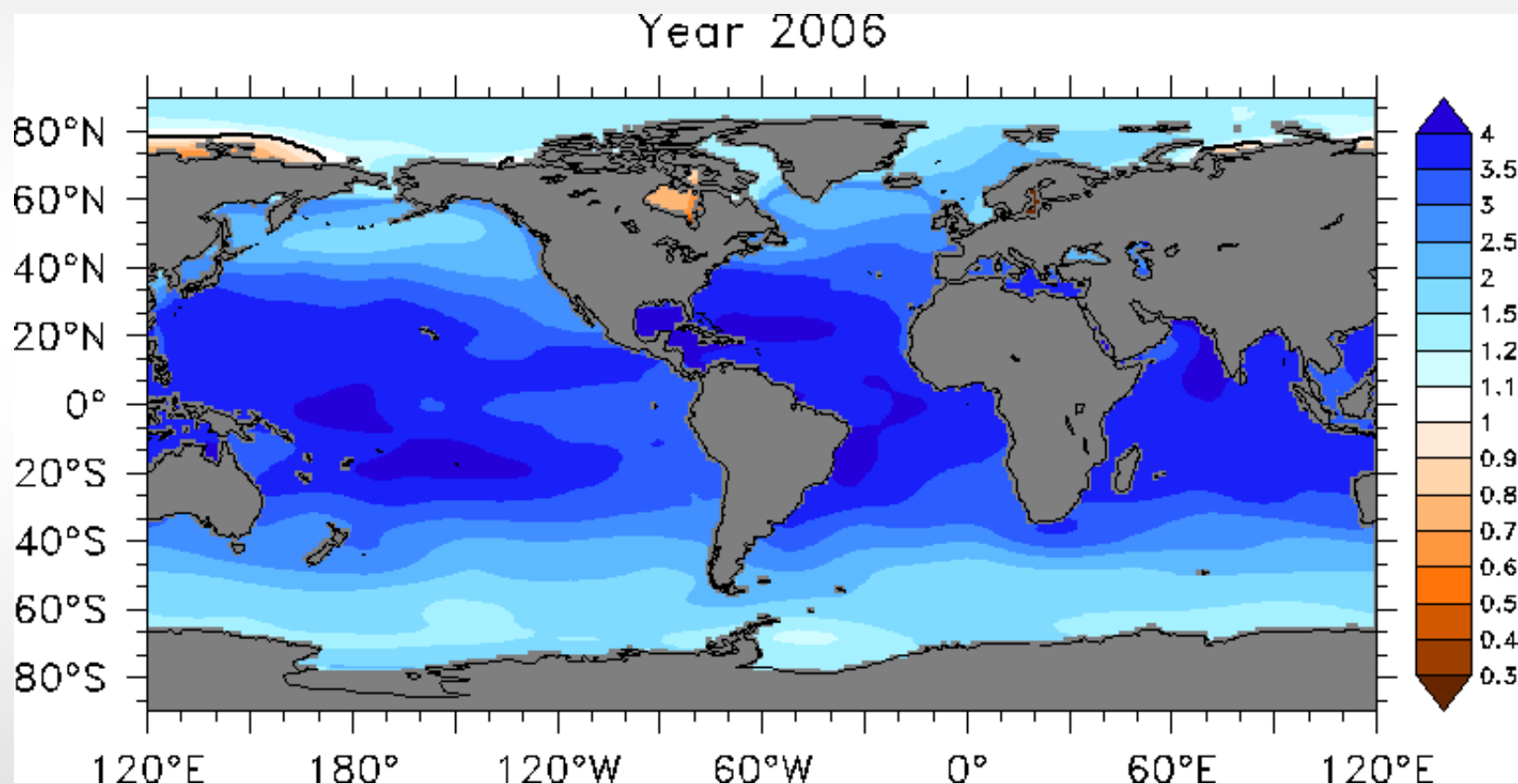


2110



Mettunarstig aragóníts á yfirborði: byggt á nýjum líkönum (IPCC AR5 WG1, 2013)

Appelsínugult táknar undirmettaðann sjó þar sem óvarið aragónít leysist upp



Mynd: James C. Orr ©

Staðfestir spár eldri líkana: Orr et al. (2005), Caldeira & Wickett (2005), Steinacher et al. (2009)

Sjá einnig: Bopp et al. (2013)



Menn

Möguleg áhrif súrnunar sjávar á fæðukeðjur (og fiskistofna) í hafinu

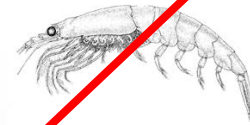
Þorskur



Loðna



Ljósáta



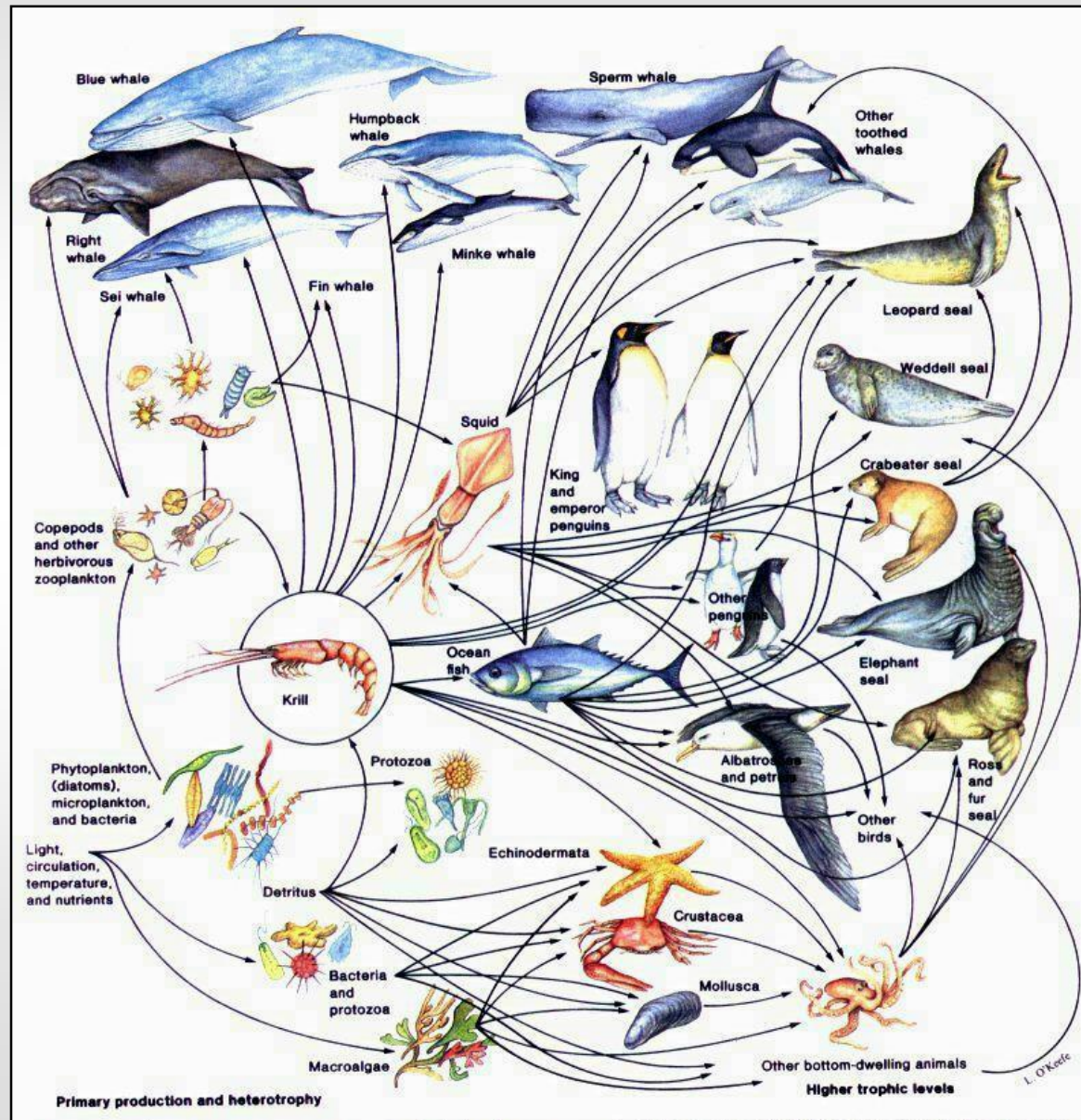
?

Svifpörungar



Kalkmyndandi hryggleysingar og
frumframleiðendur virðast
sérstaklega viðkvæmir hópar.

Fæðukeðjur eru hluti af flóknum fæðuvef



Að lokum

***Heilbrigt vistkerfi er undirstaða
öflugs sjávarútvegs.***

*Hröð súrnun sjávar og lækkandi kalkmettun ógnar
vistkerfinu í hafinu við Ísland.*

Þekking er verðmæt

*Það felast efnahagslegir hagsmunir í þekkingu á hafinu,
þeim breytingum sem þar eru að eiga sér stað og
mögulegum áhrifum þeirra.*