

Climate instability and the demise of the Greenlandic Norse

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THE NORSE SETTLEMENT MYSTERY

THE NORSE SETTLEMENTS TIMELINE

985 CE Settlement → **Thived >400 yrs (~2,000 people)** → **~1300 CE Decline** → **1410 CE Last voyage**

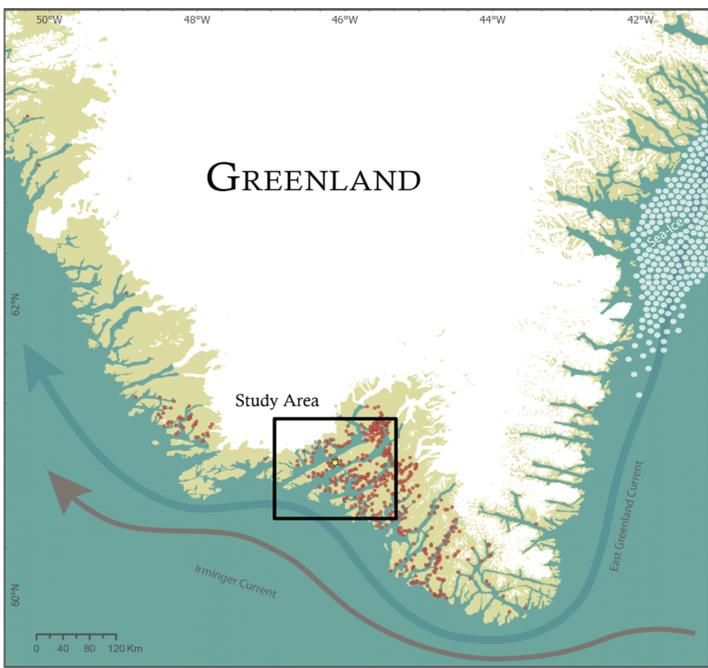
THE QUESTION: What caused one of history's most striking examples of societal collapse?

PROPOSED EXPLANATIONS: Climate change, Sea-level rise, Economic isolation, Competition with Inuit, Disease, Vegetation loss

OUR APPROACH: High-resolution multi-proxy paleoclimate reconstruction from Narsaq Sound sediment core (GeoB25206-2) including ancient environmental DNA.



NORSE REGIONAL AND LOCAL ENVIRONMENTAL RECONSTRUCTION

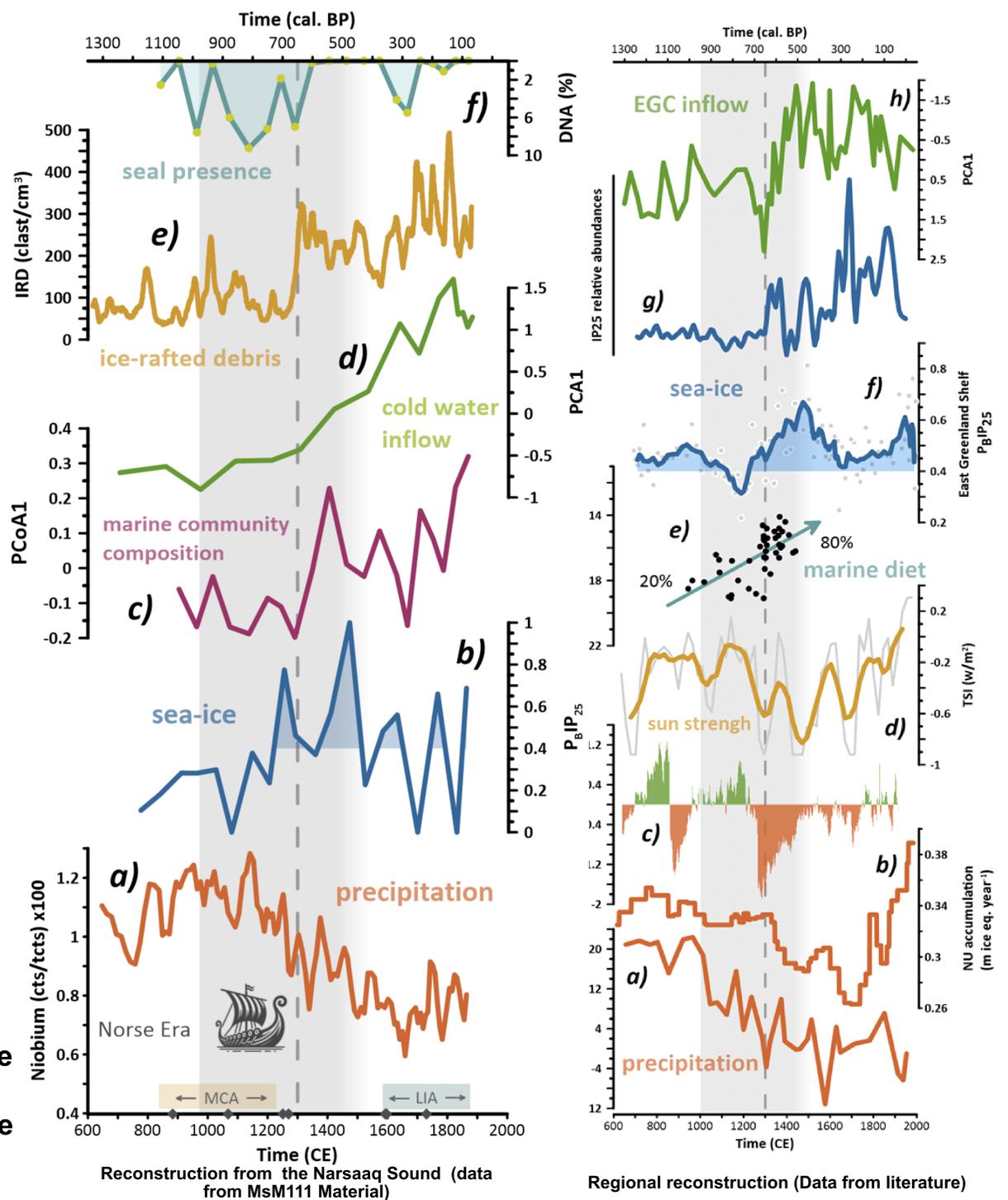


REGIONAL CLIMATIC SETTINGS

- Medieval Climate Anomaly (MCA): Wetter, positive NAO
- Little Ice Age (LIA): Drier, negative NAO

KEY NOVEL OBSERVATIONS

- Long-term drying BUT vegetation remained stable
- Enhanced East Greenland Current (EGC) bringing cold Arctic water + sea ice blocking the Fjord
- Gradual shift in marine community.
- No environmental modification due to Norse settlement.
- Disappearance of seal DNA preceding Norse abandonment



PROPOSED CASCADE OF COLLAPSE

1. **NAO SHIFT:** Positive → Negative (Atmospheric cooling)
2. **ENHANCED EAST GREENLAND CURRENT:** Arctic water + sea ice export south.
3. **LOCAL IMPACTS:** (~1300 CE); Drying trend, Sea ice expansion
4. **CRITICAL IMPACT:** Fjords blocked, cut communication between farms and trade.
5. **SOCIAL CONSEQUENCES:** Forced dietary shift (marine food) including seals.
6. **DECLINE:** Seal population disappear, Norse population has no more food
7. **DISAPPEARANCE:** Last voyage to Iceland: 1410 CE, no evidence of mass death.

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