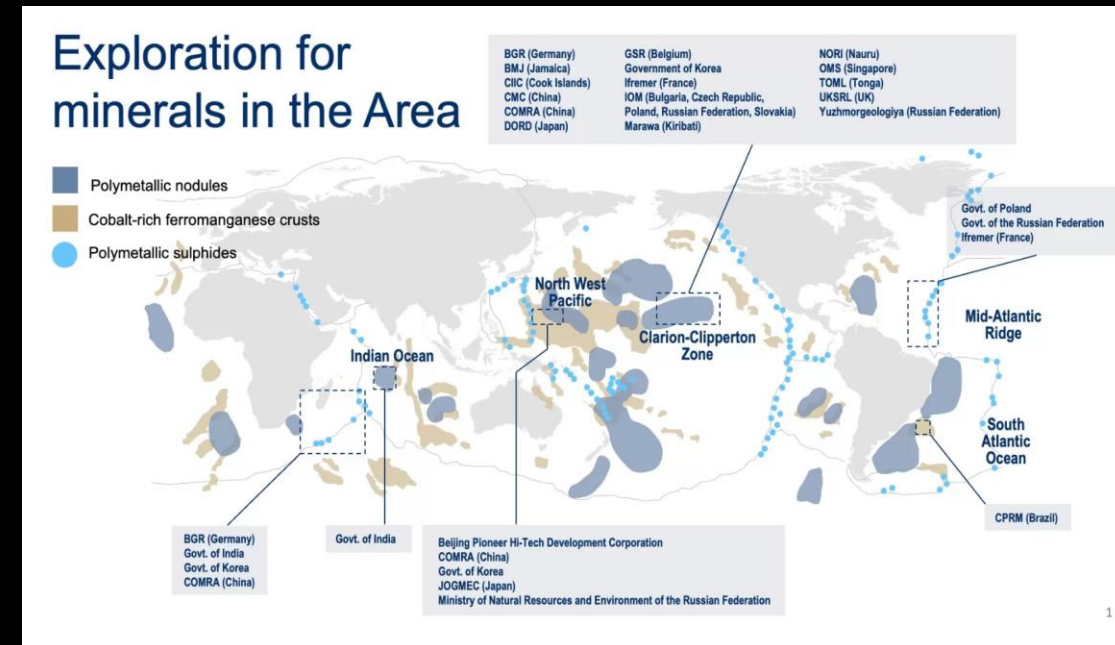


How scientists might exert pressures studying the deep sea?

Riwan Leroux, Jozée Sarrazin, Pierre-Marie Sarradin, Marjolaine Matabos
03-20-2025 | EMB Third Thursday Science Webinar

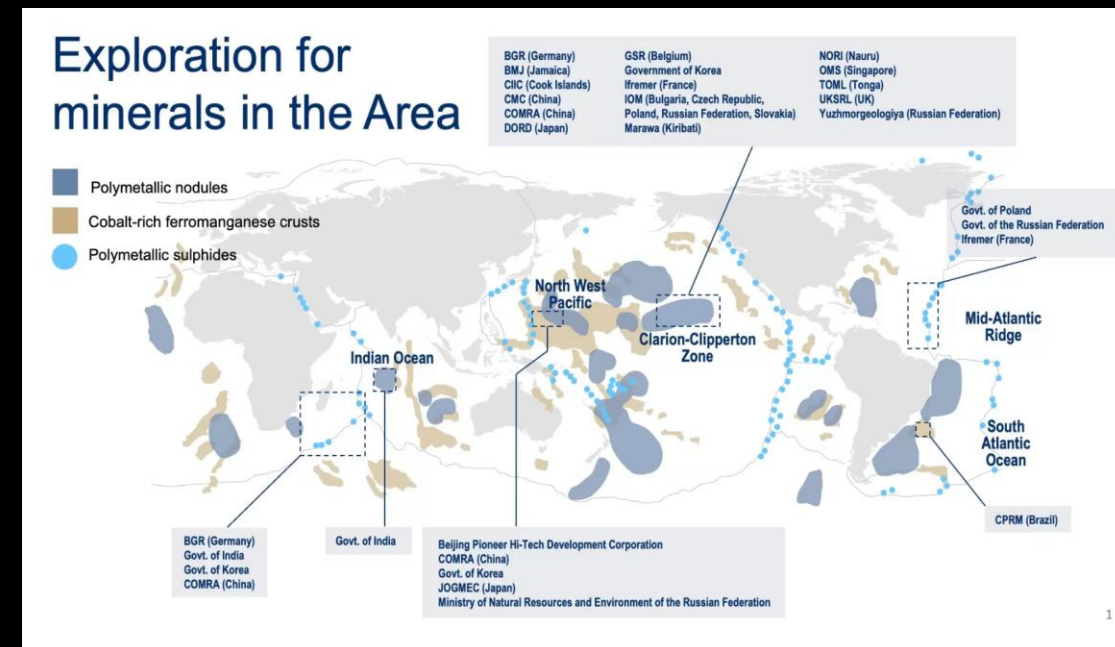
Anthropogenic pressures in the deep sea

- Global pressures:
 - Climate change: Temperature rise, acidification, deoxygenation
 - Pollution: contaminant, plastics
- More local pressures:
 - Energy exploitation: gas and oil extraction
 - Living resources: fishing, trawling
 - In a near future :
 - Engineering climate intervention (mCDR)
 - Mineral exploitation (Nodules, Seamounts, Hydrothermal vents)



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Hydrothermal vents

- Discovered in 1977
- Oasis of life
- High biomass ecosystems
- Primary production: Chemosynthesis
- Create Seafloor Massive Sulphide deposits

Future mining exploitation at inactive vents ?

Hydrothermal vents



What about active vents ?



Hydrothermal vents

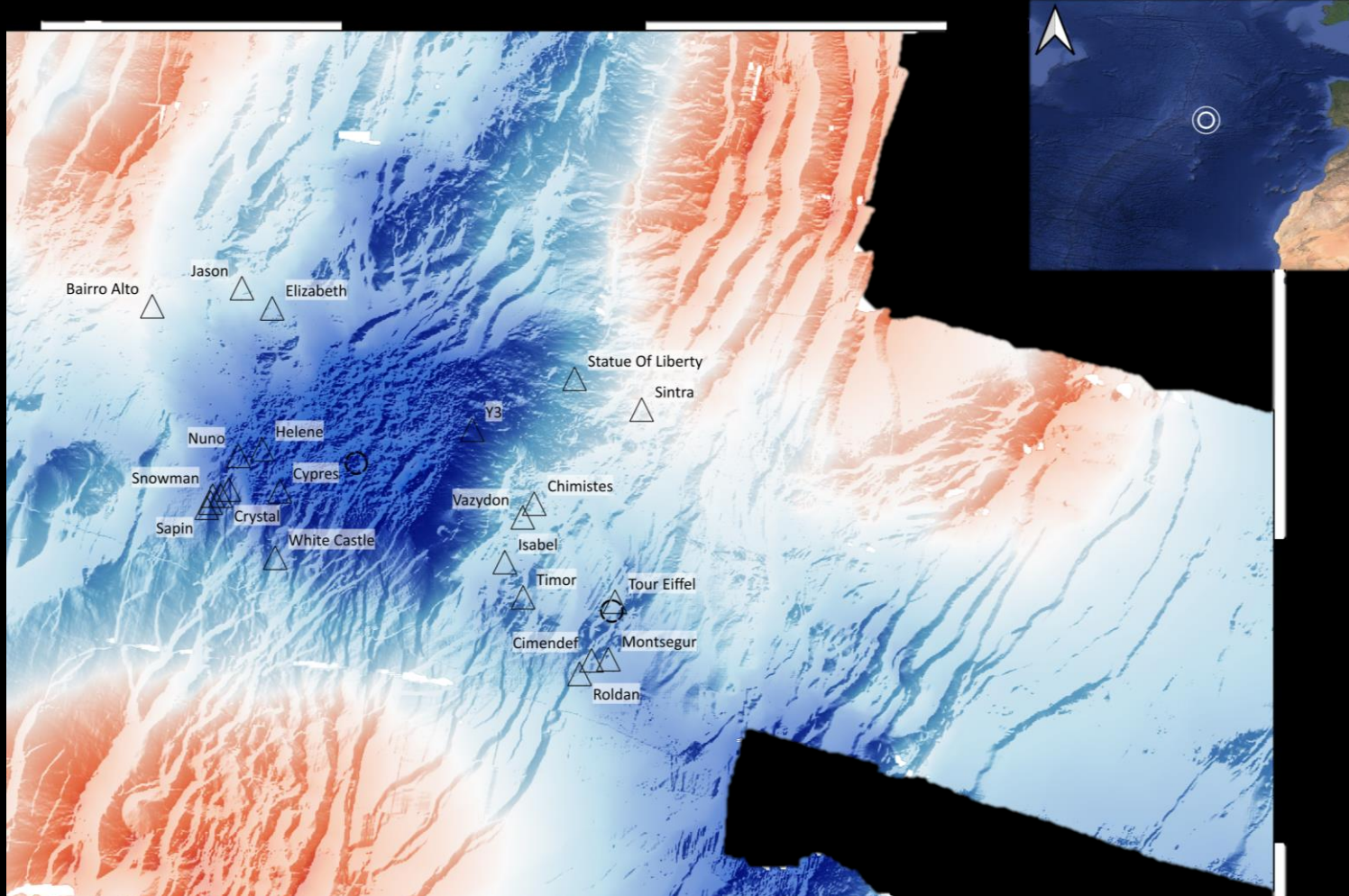
- Currently, one direct pressure at hydrothermal vents

Are these pressures significant and do they impact the ecosystem ?

Research activities



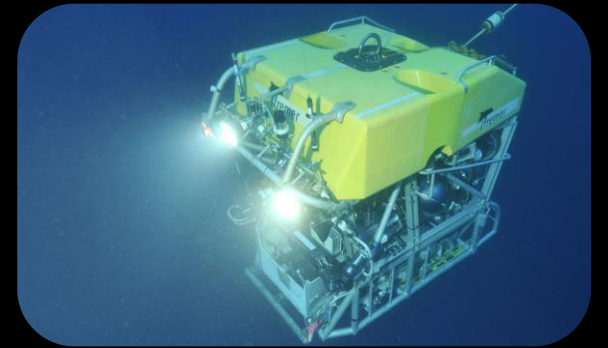
Lucky Strike: 33 years of science in a MPA



- Extensively studied
- Host the EMSO-Azores observatory since 2010
- 39 oceanographic cruises
- More than 300 dives
- Thousands of scientific investigations

Research activities

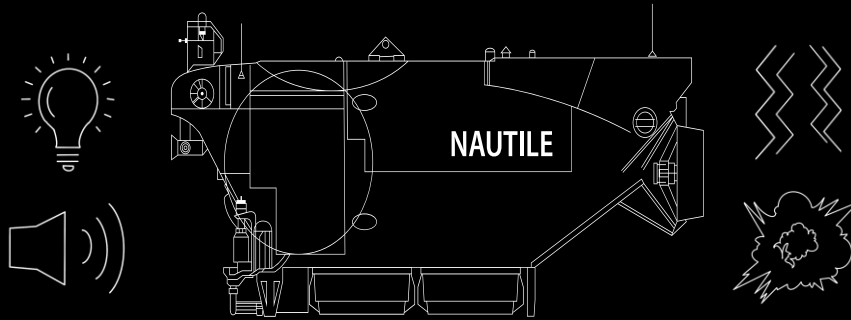
A cumbersome data mining in archives



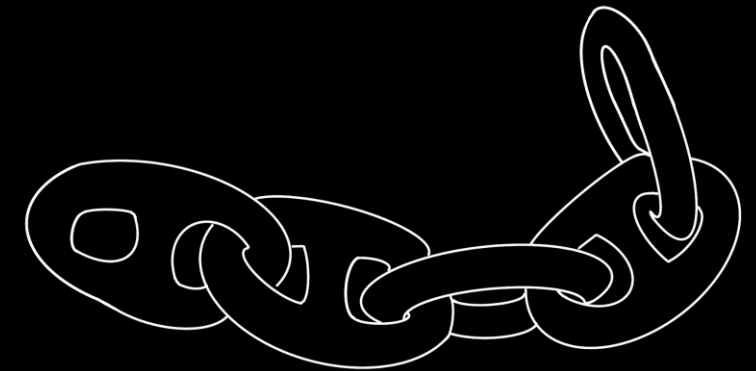
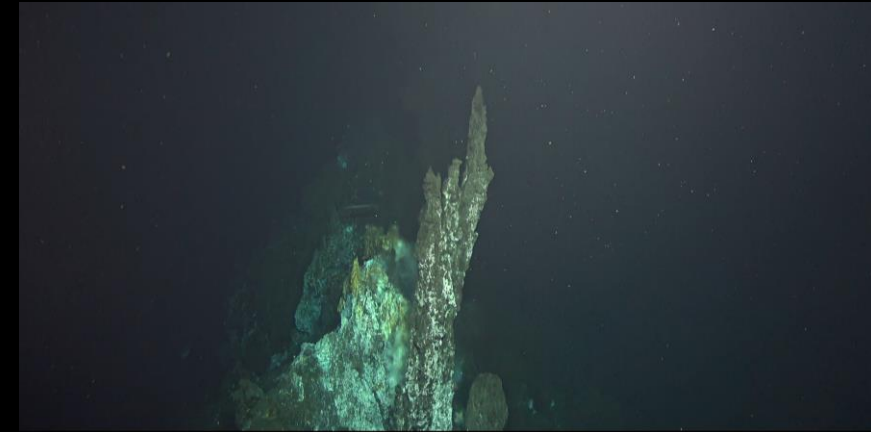
Research activities



3000 samples



> 3000 hours of submersible



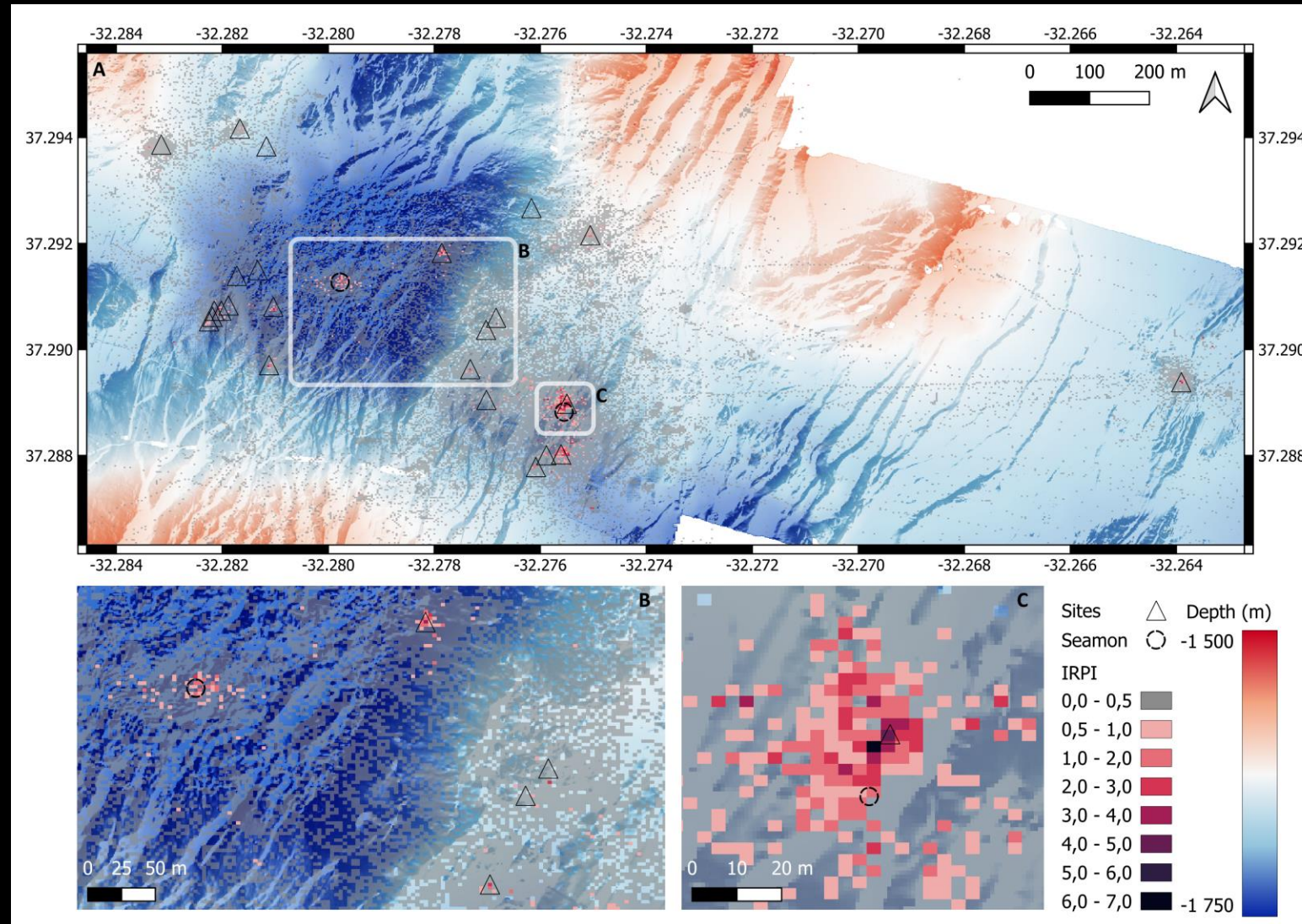
200 tons of metallic deposition

Weighting

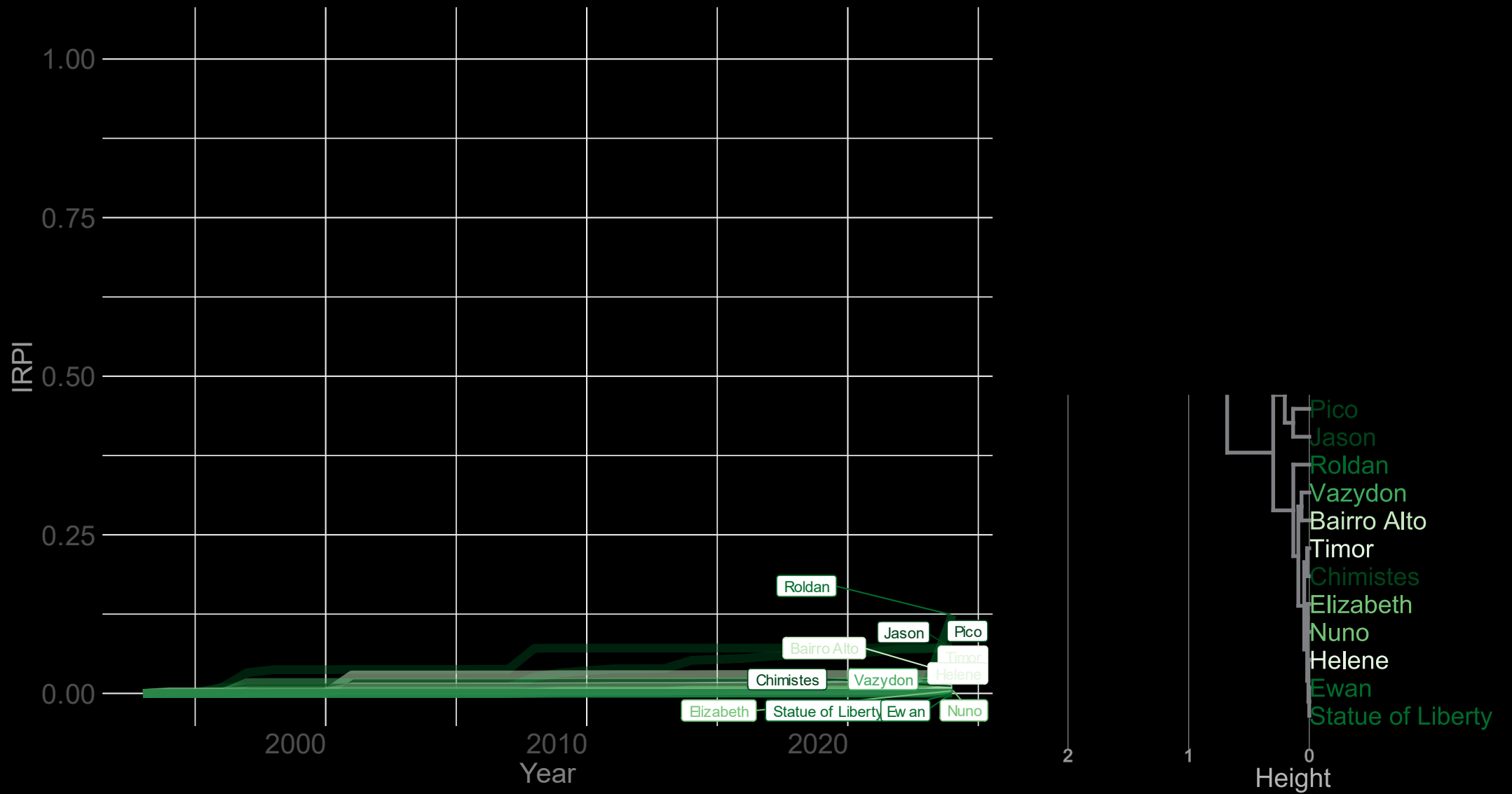
Integration

Mapping

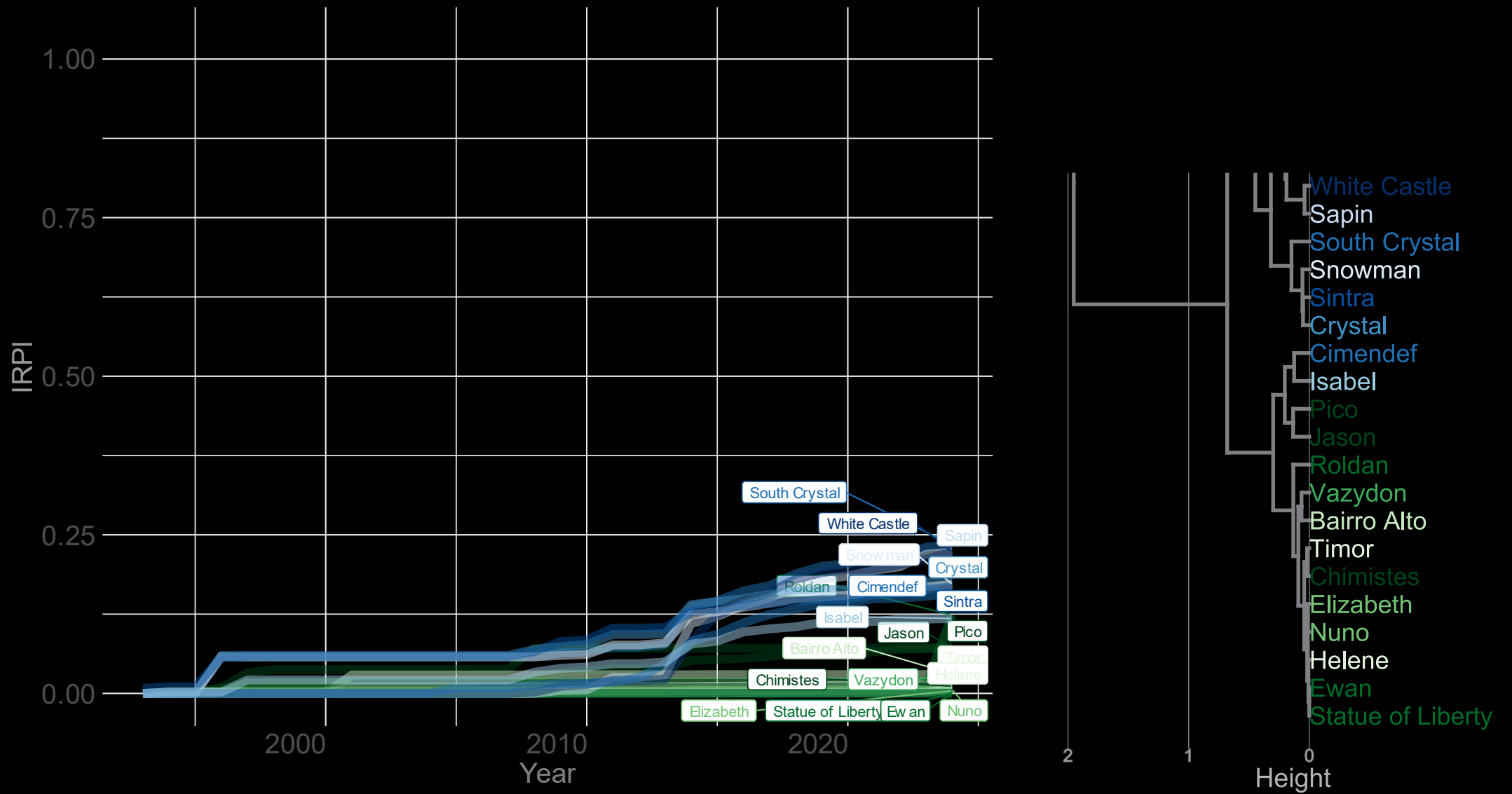
Research pressure mapping at Lucky Strike



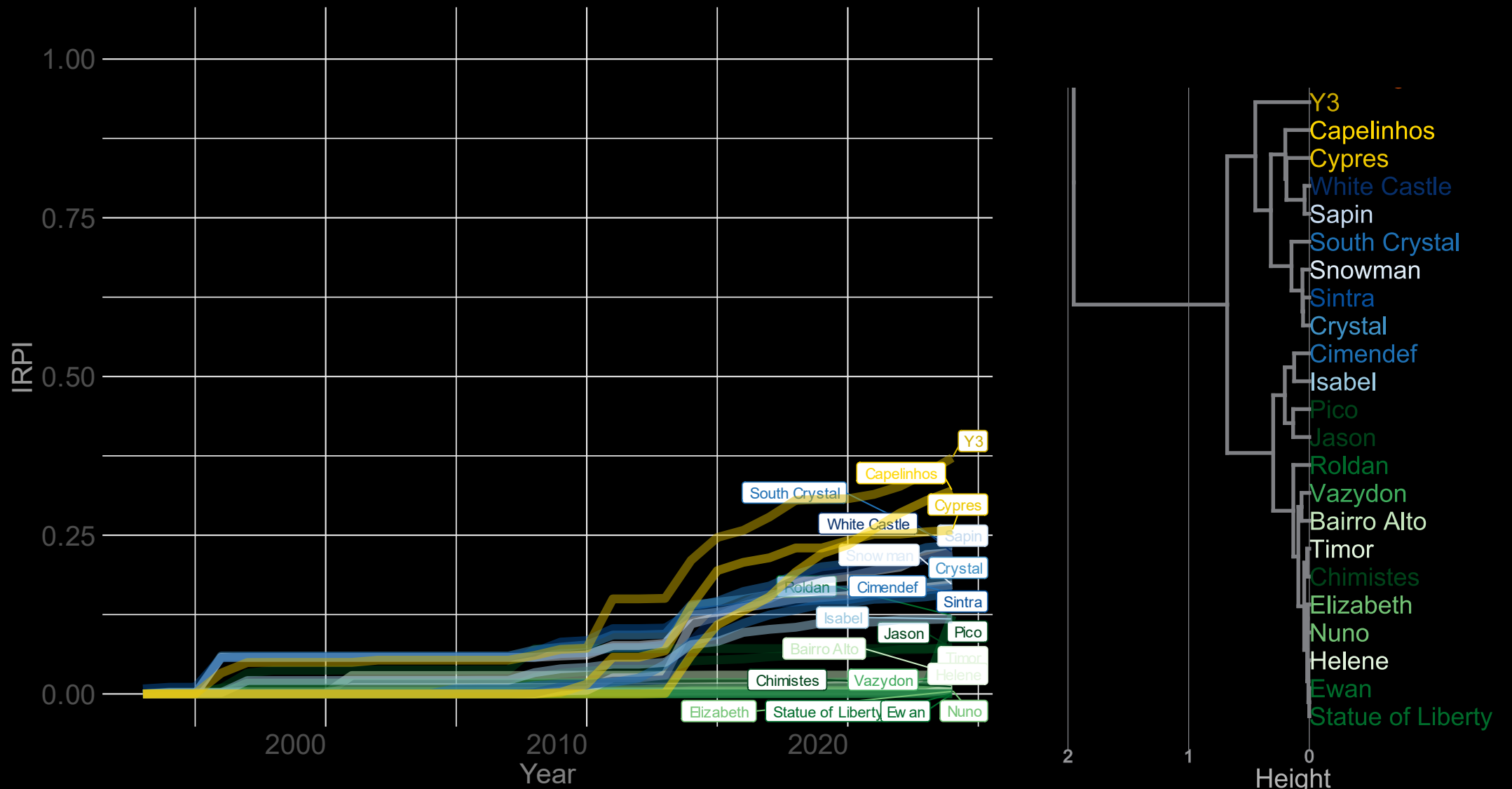
Unequal pressure at active sites



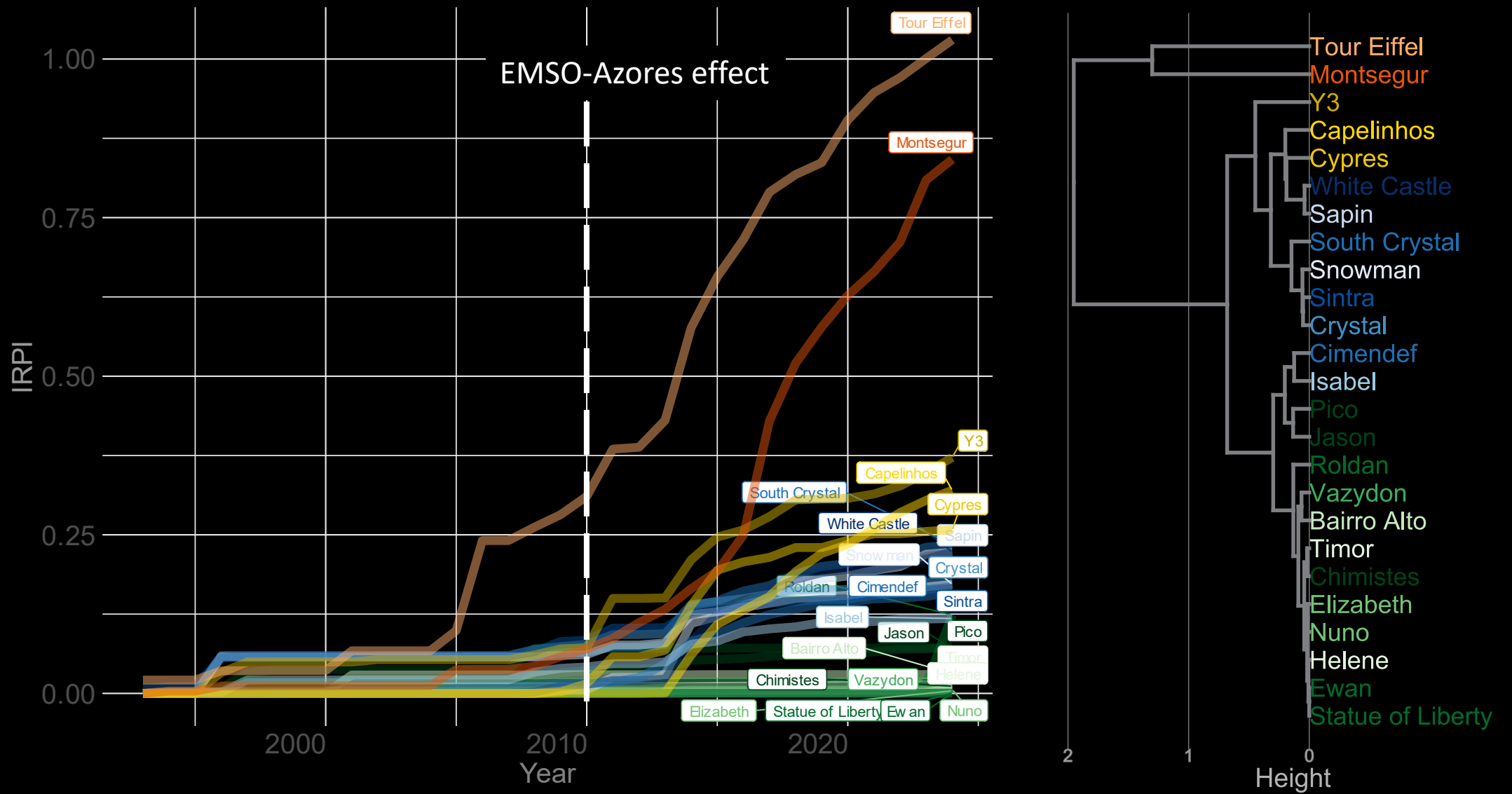
Unequal pressure at active sites



Unequal pressure at active sites



Unequal pressure at active sites

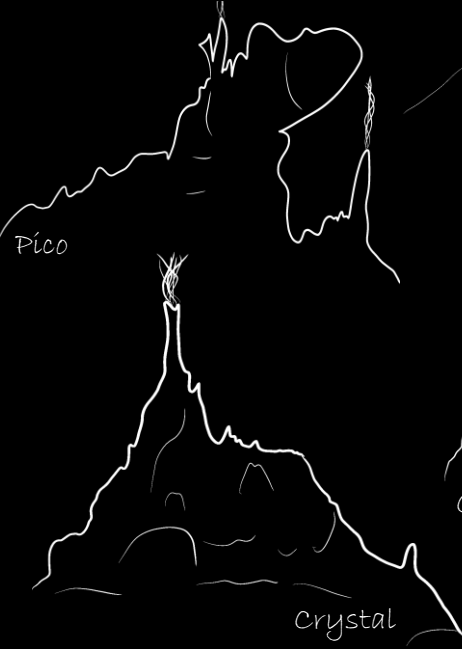
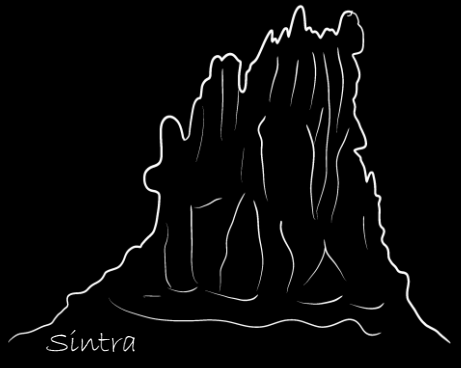
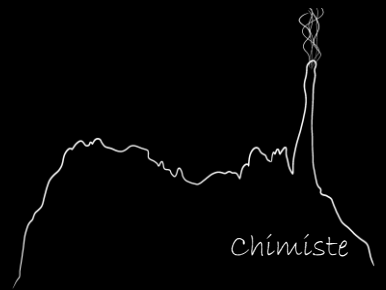
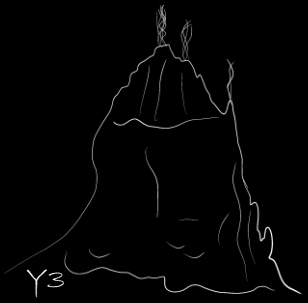
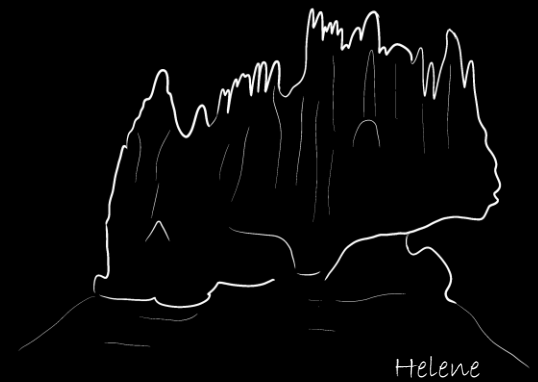


Impact assessment at active sites : 3D reconstruction of 2024



- IRPI
- Mussel beds
- Assemblage distribution
- Hydrothermal features

→ MPA management recommendations



Thank you !
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