

Biogeography in the Anthropocene



Prior to globalization:
Similar species live close
together.



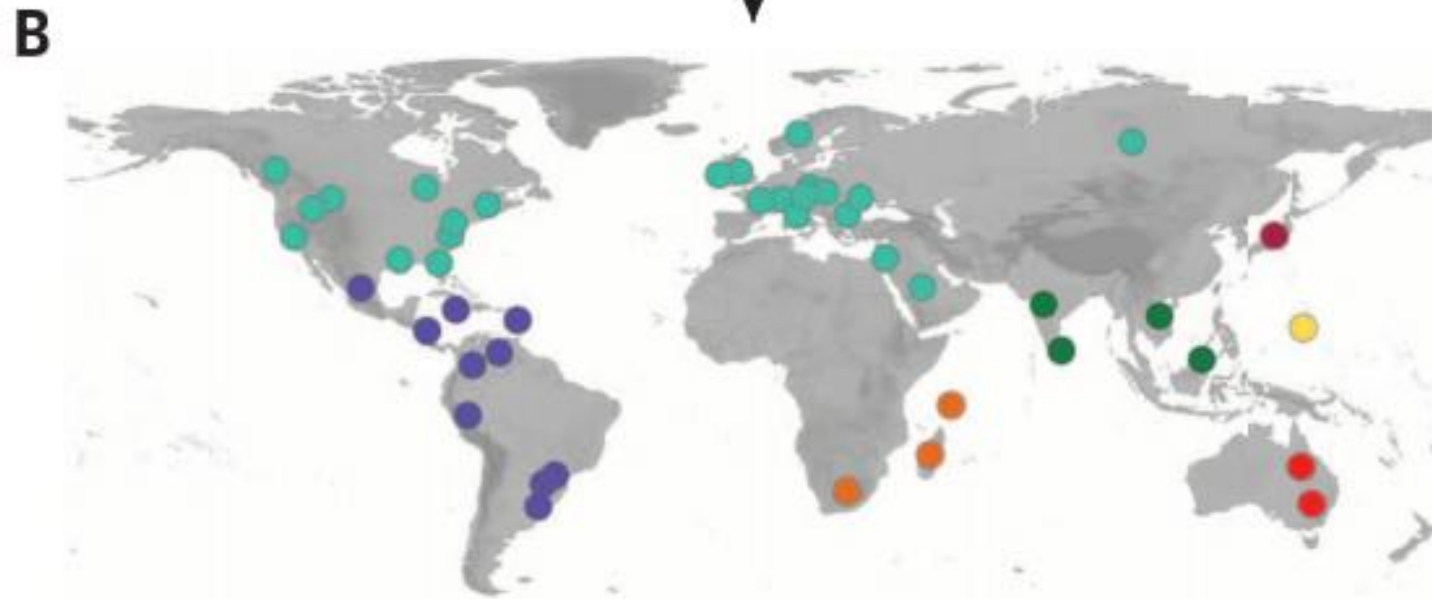
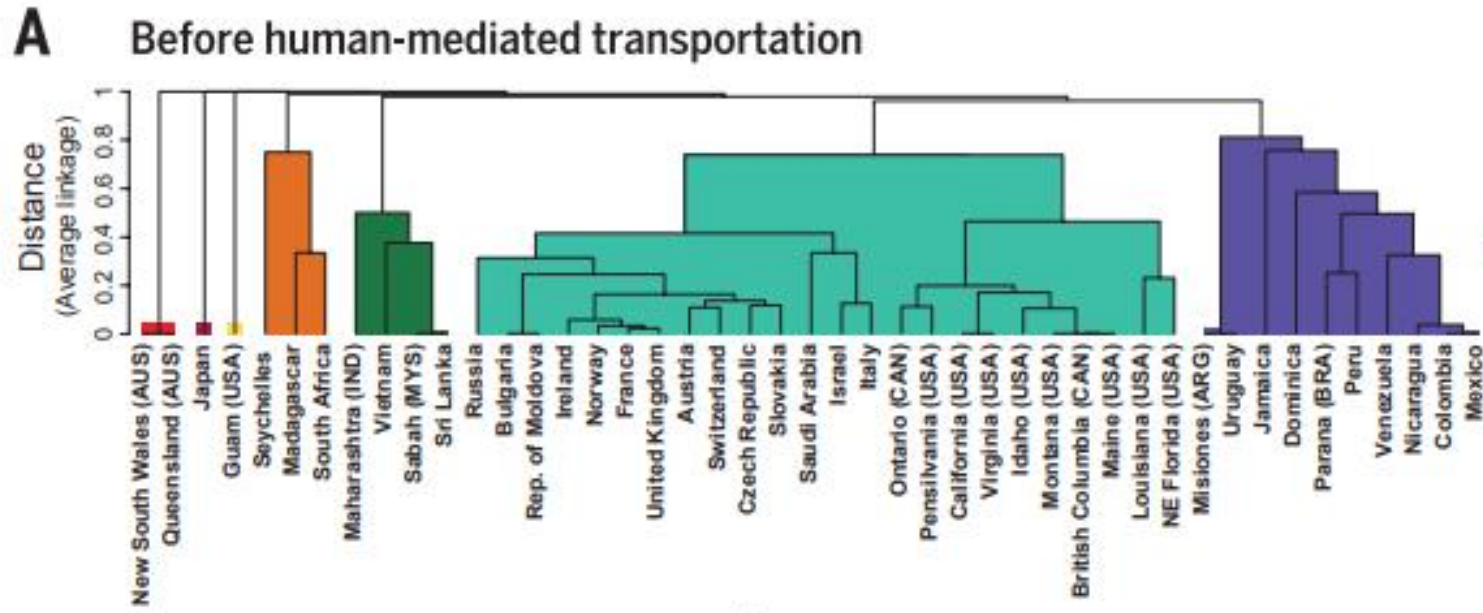
After globalization: Species live anywhere they can.



Gastropods

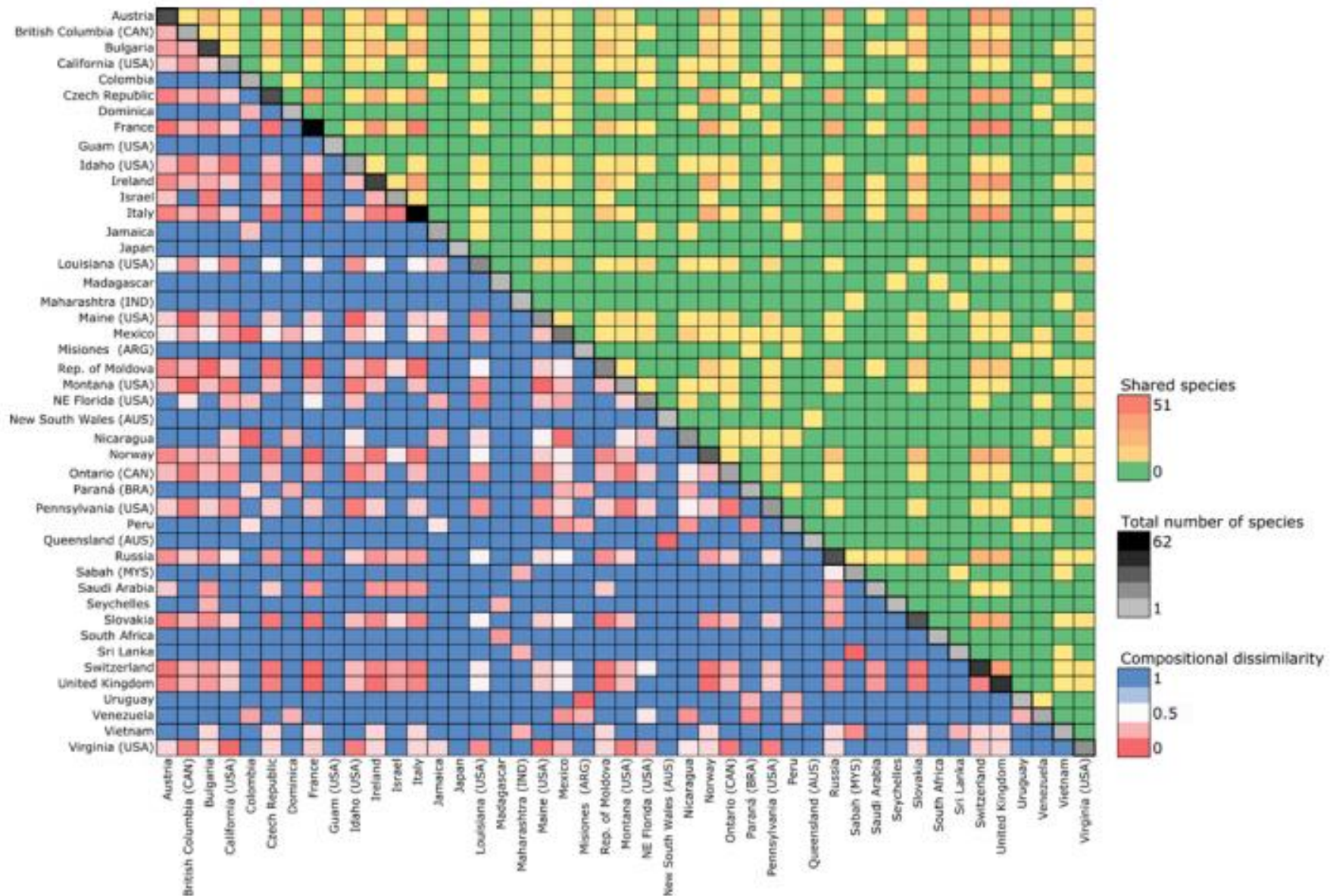
175 species introduced since AD 1500
140 native species

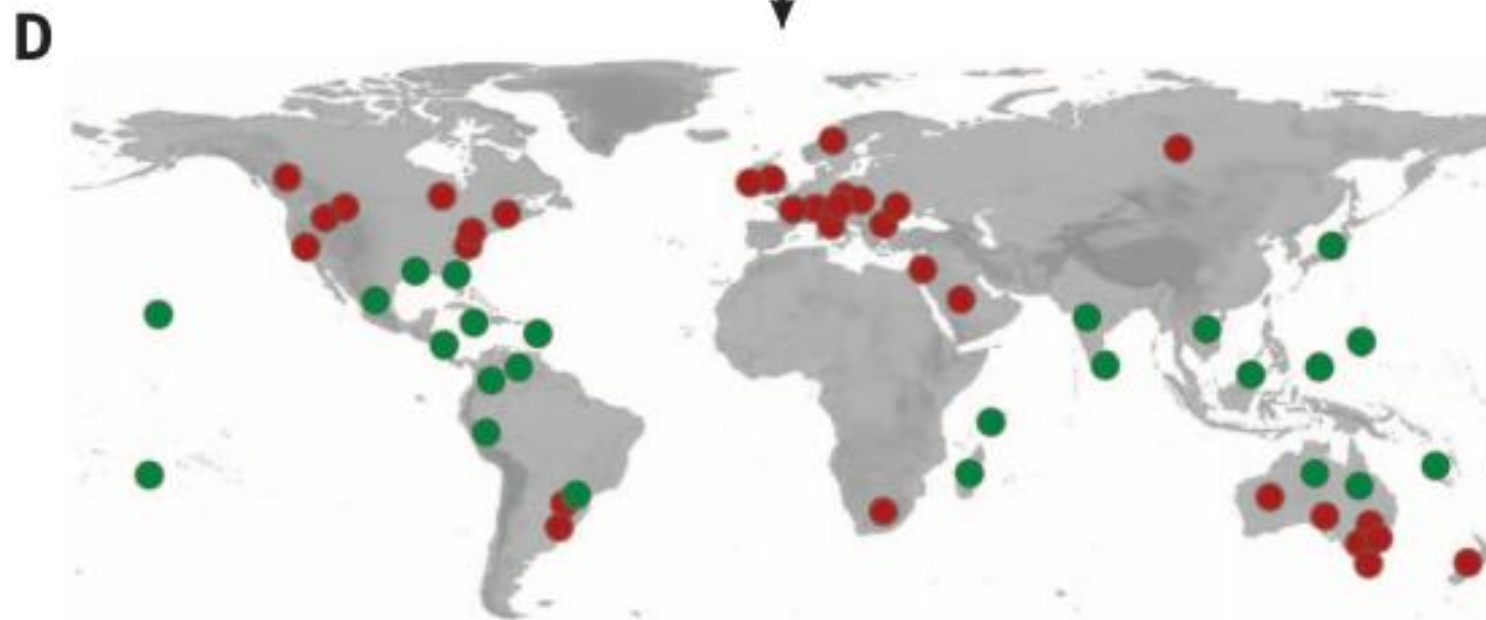
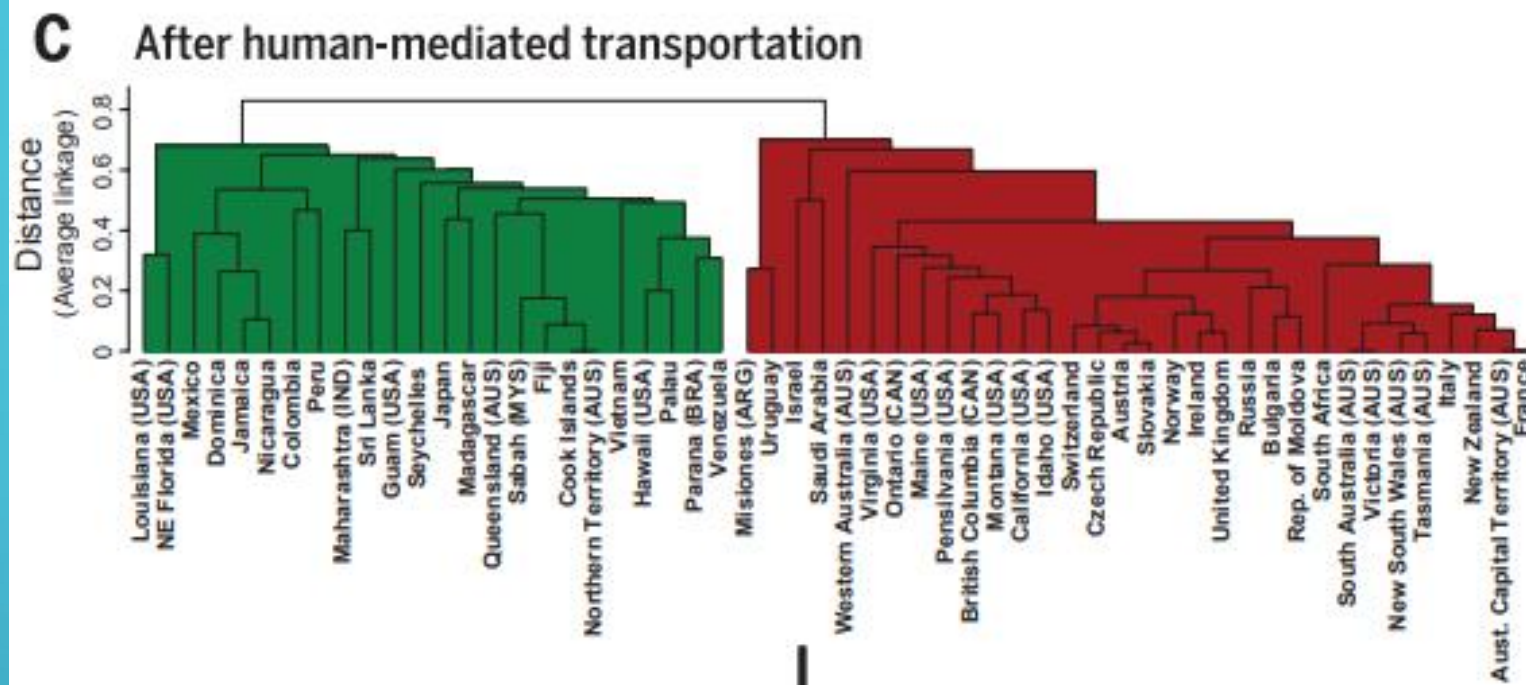




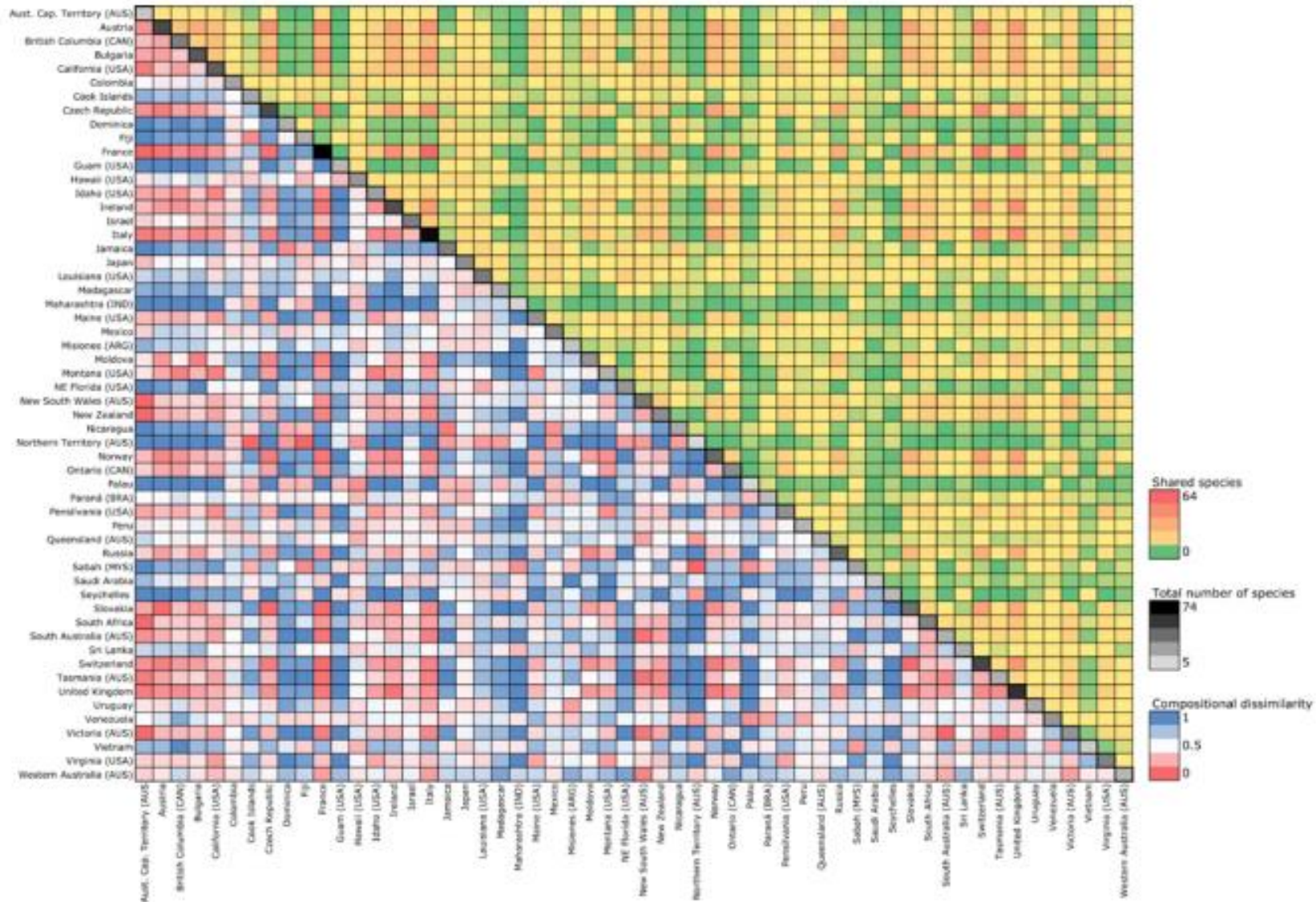
Locations
over
~11,000 km
shared no
species in
common.

Native Distributions

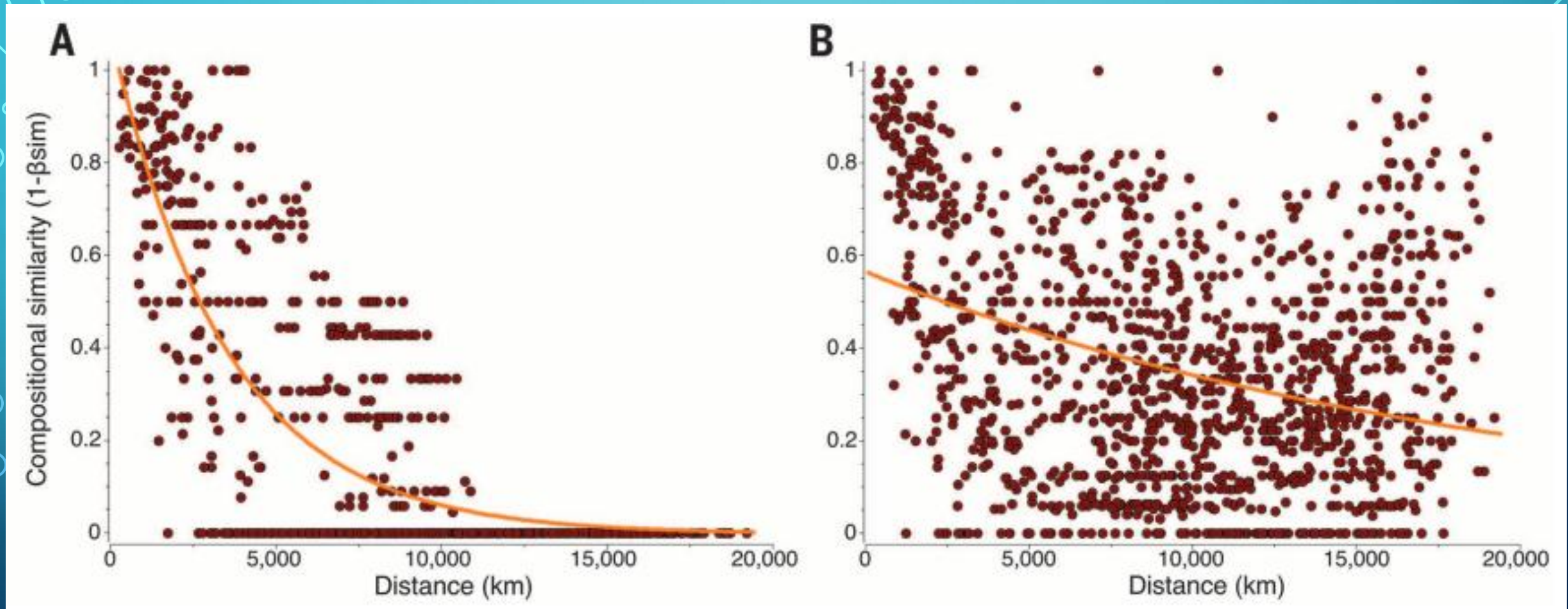




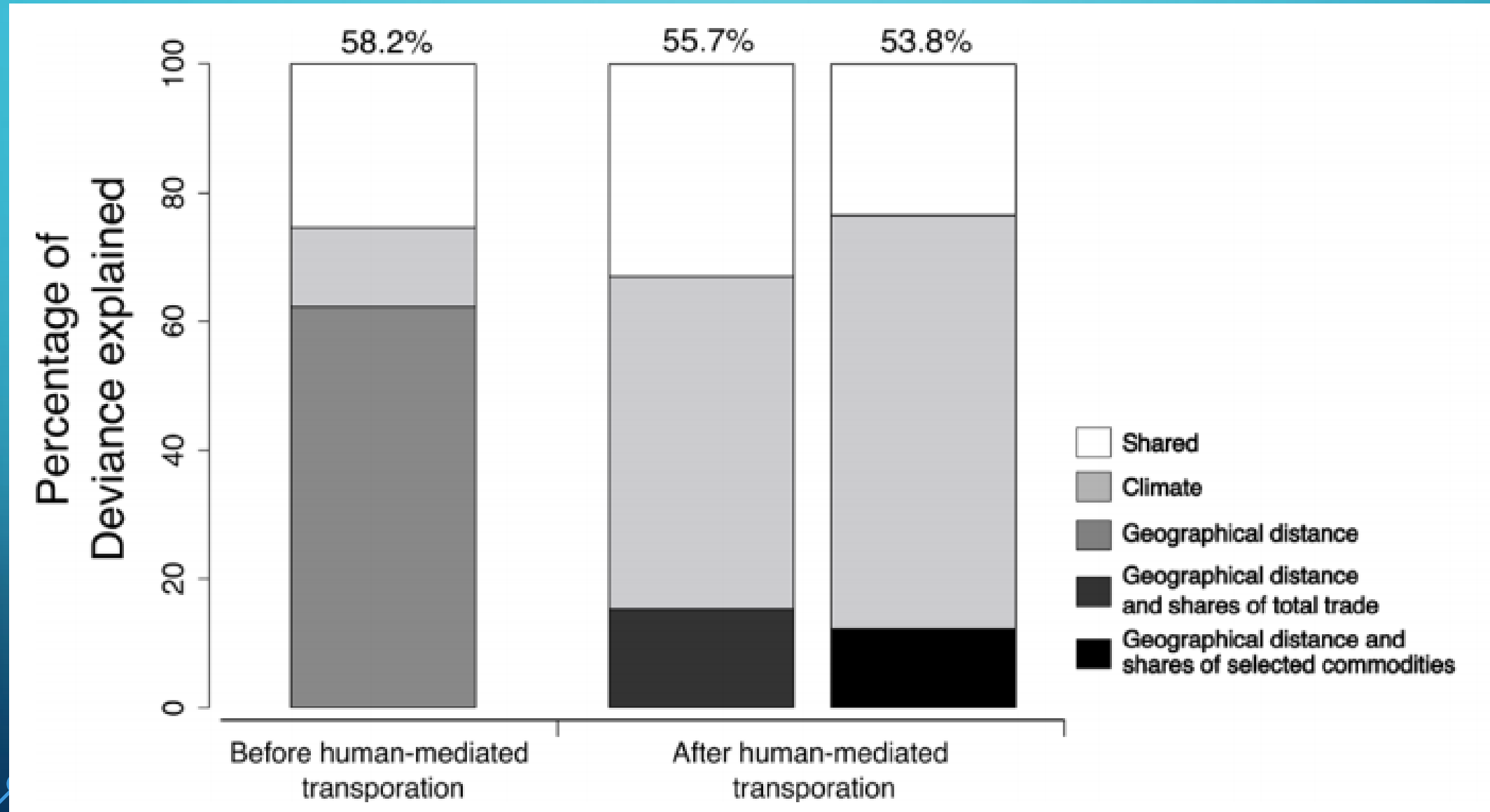
Present Distributions



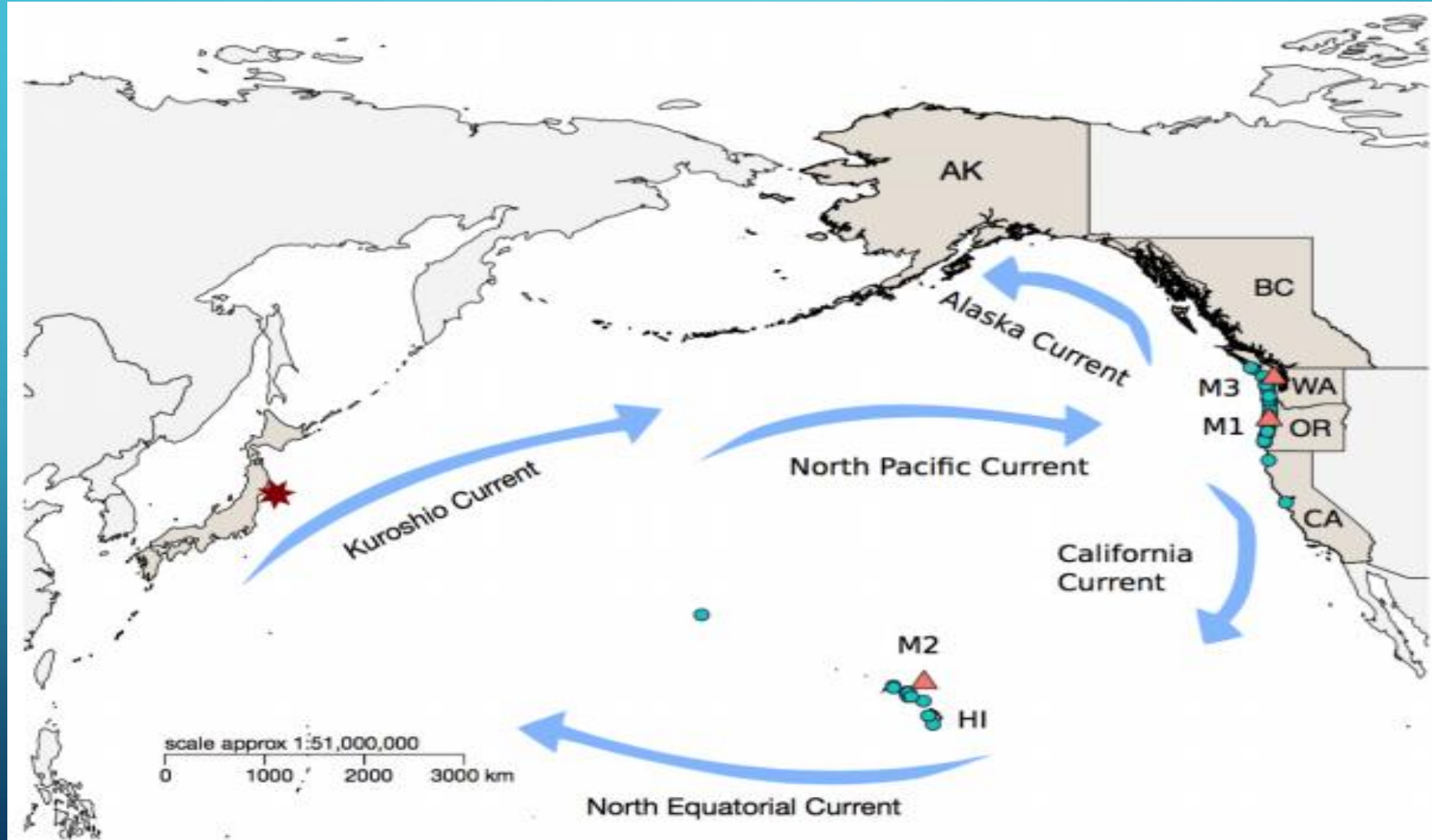
Change in Geographic Relevance



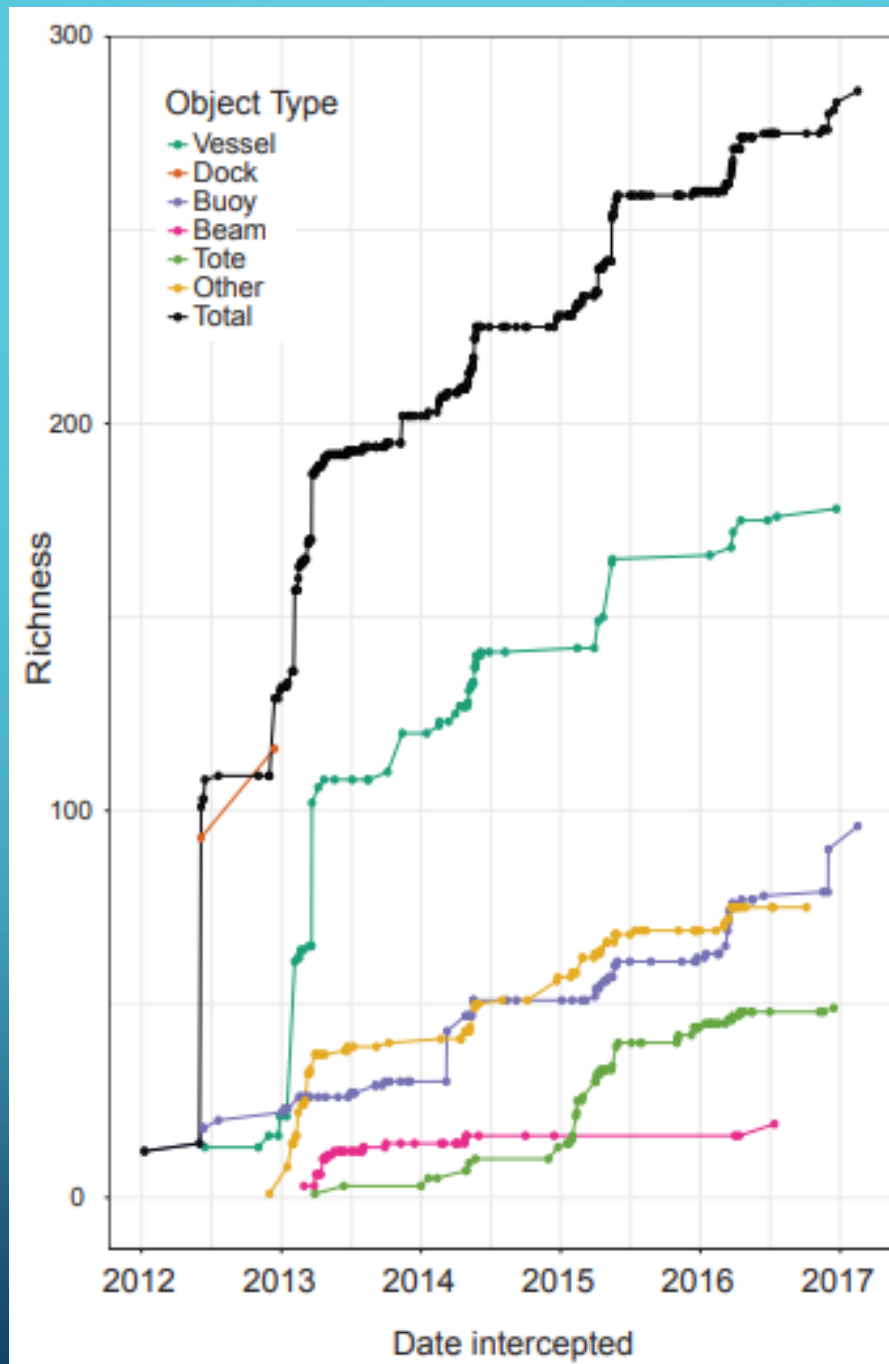
Increased Relevance of Climate and Trade



Tsunami-driven Rafting

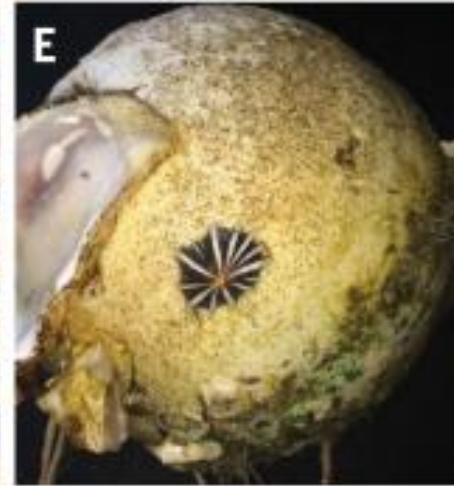


Live specimens continued to be found even 5 years after the first landings, 4 years longer than previous record.

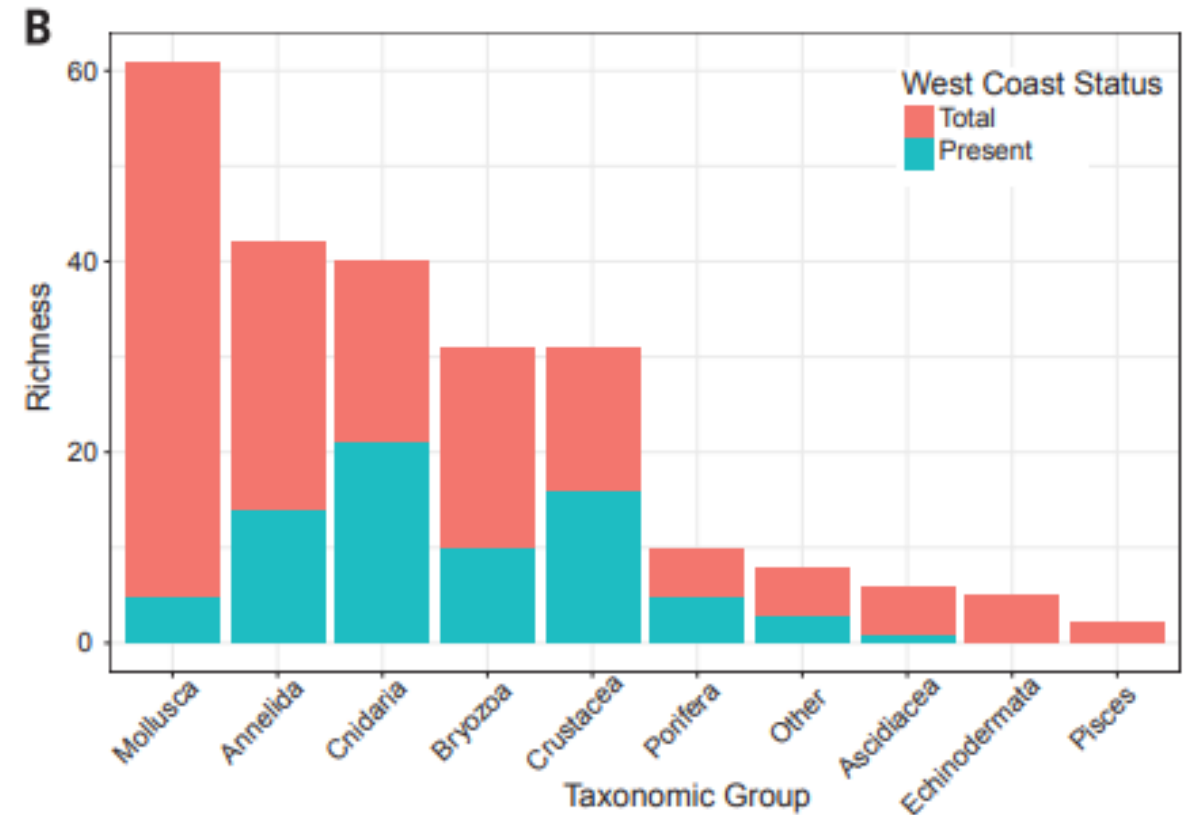
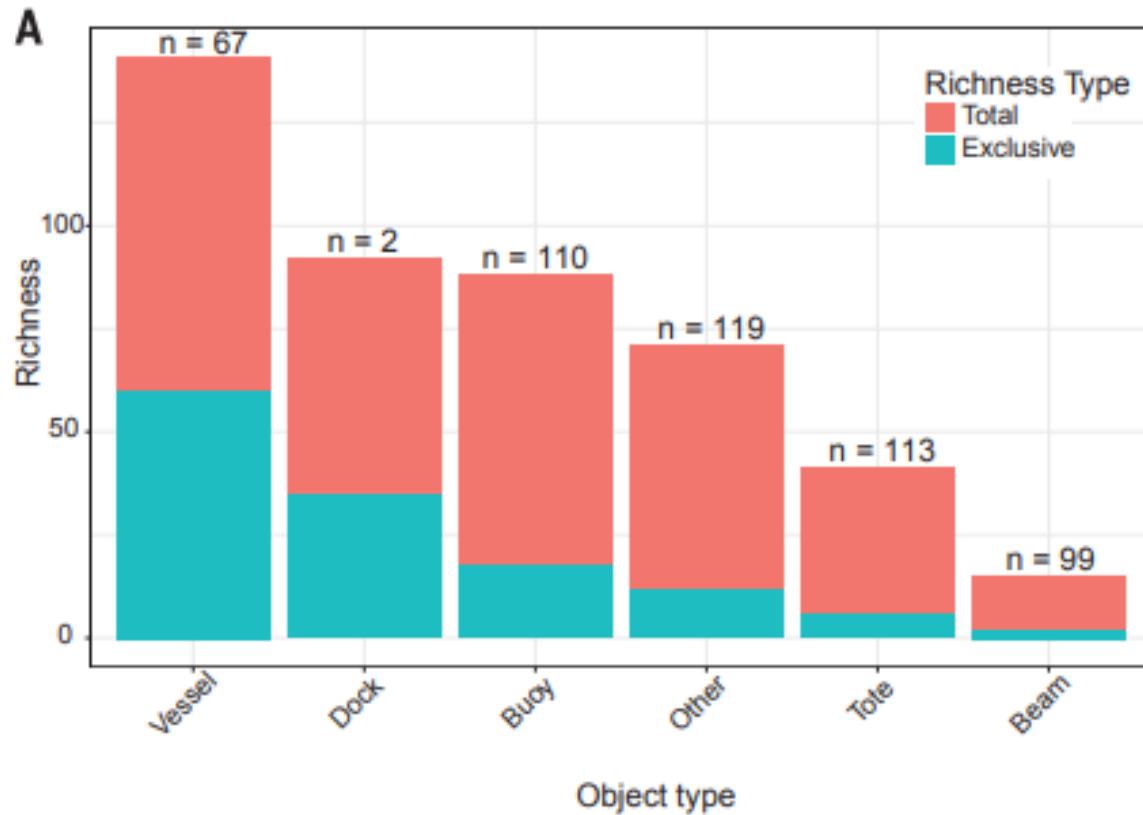


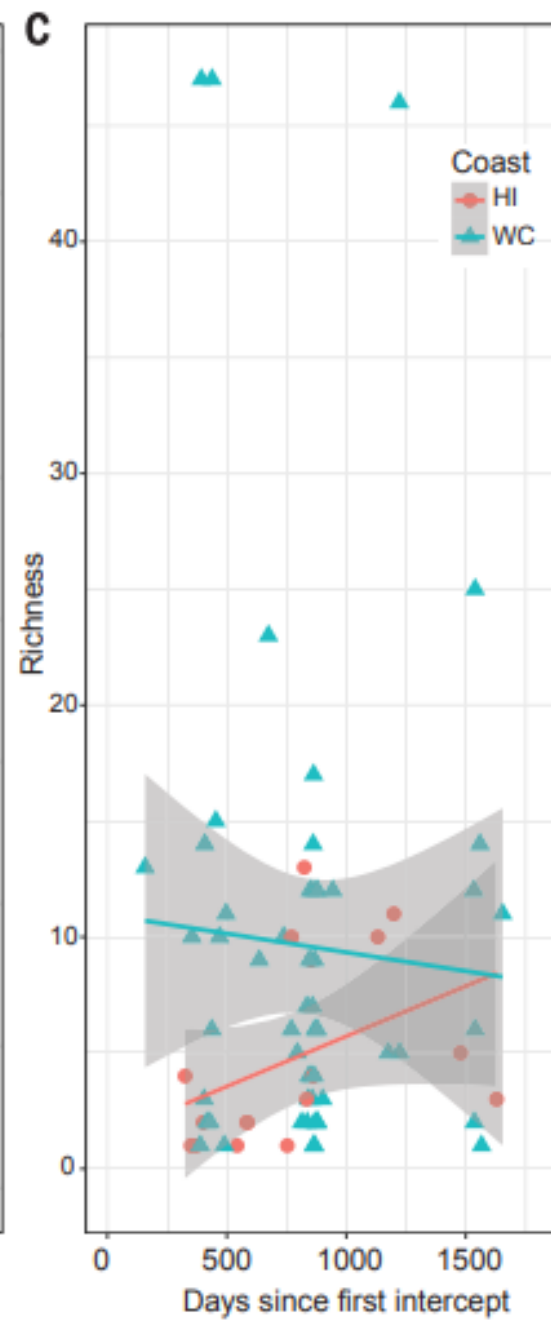
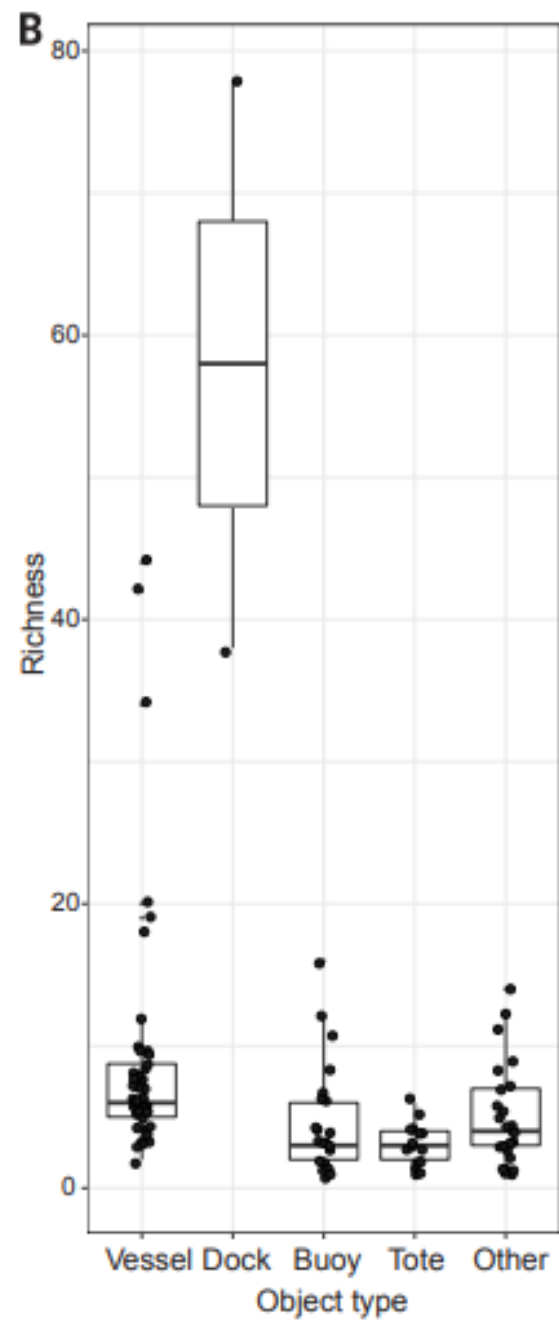
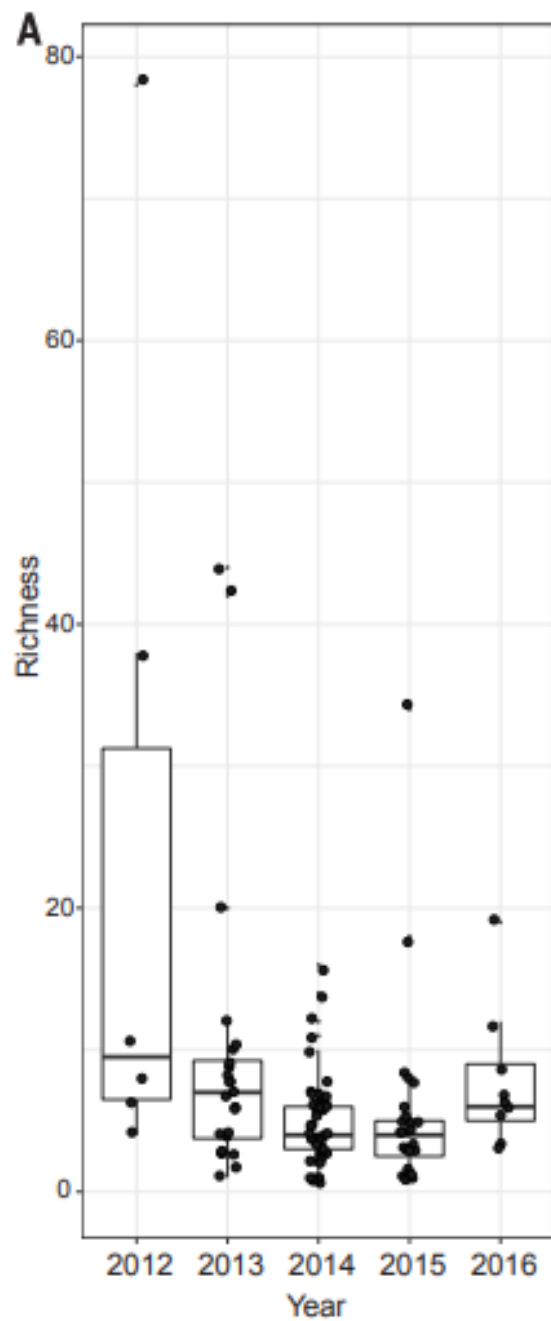
Many species even showed evidence of reproduction during their voyage.

Japanese Tsunami Marine Debris (JTMD)



Species found, by JTMD and by taxa.





Facts suggesting potential invasiveness:

- Many of the JTMD species already have established populations on the eastern Pacific coast.
- JTMD species showed a robustness in surviving and even thriving the voyage across the ocean.
- Debris landings often occur in spring when temperatures will be more conducive for life.

Rafting by synthetic material may be a new and unique way to cross old biogeographic barriers.

