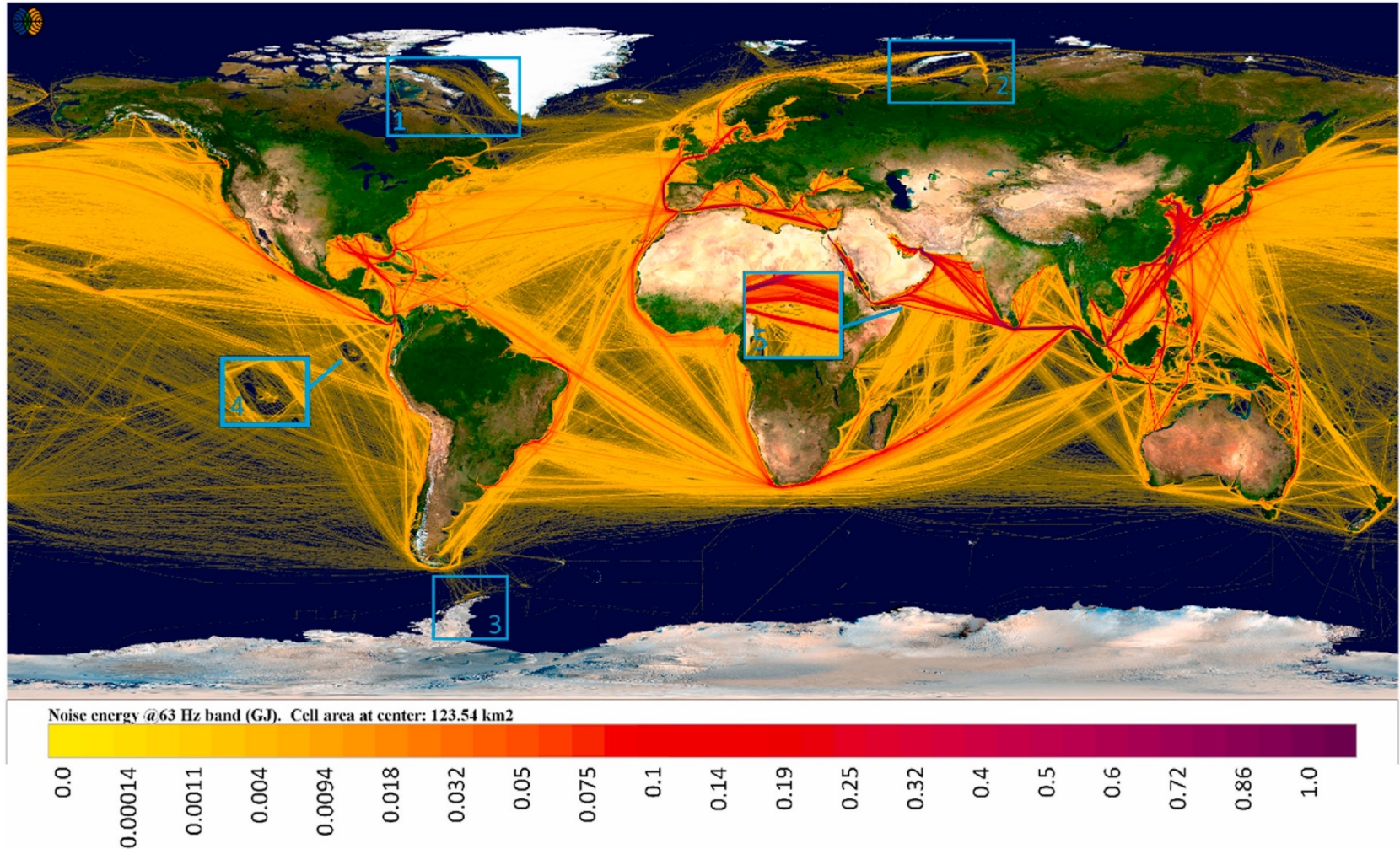


Underwater noise emissions from ships, 2019

Labeled areas: 1 Baffin Sea with Milne mining operations; 2 Kara Sea with Yamal gas fields; 3 Palmer Basin research stations; 4 Galapagos Islands; 5 Socotra Island (Yemen)



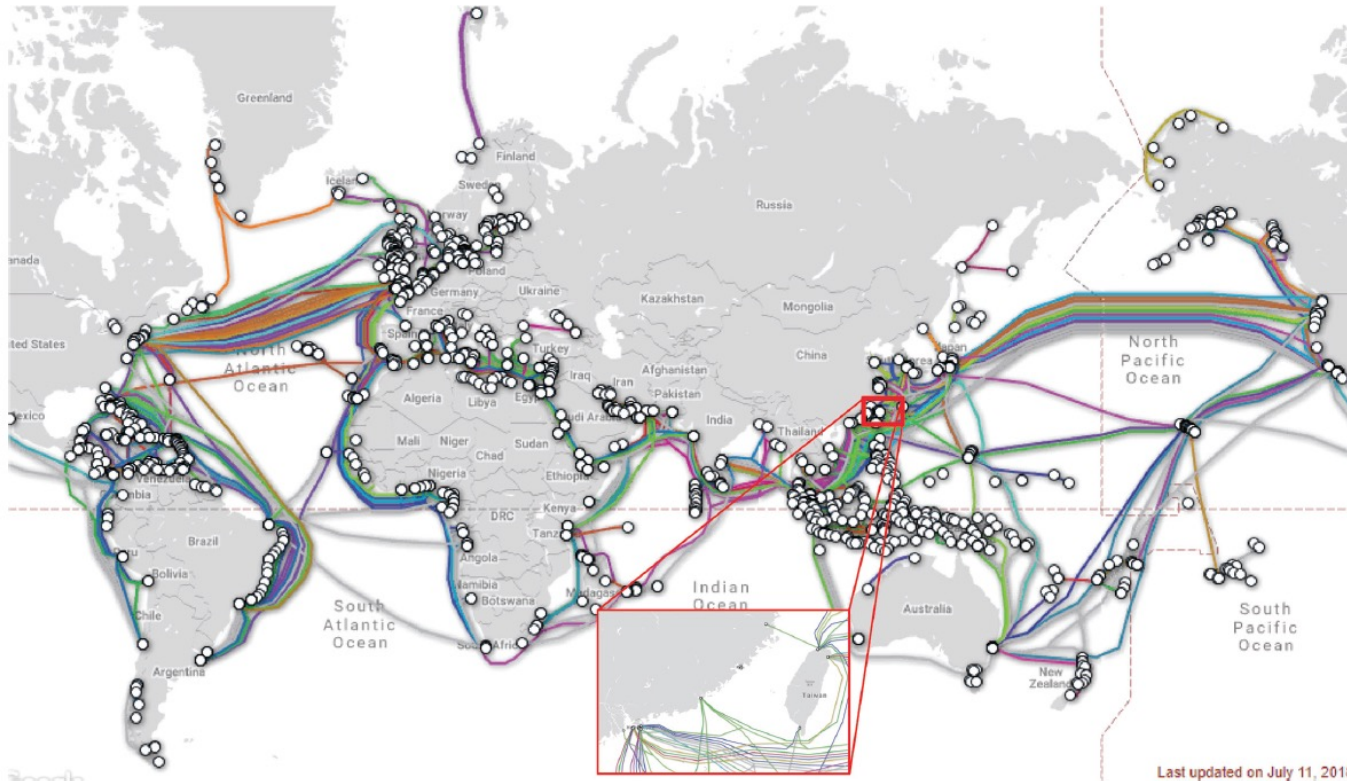
63 Hz 1/3 octave band, in gigajoules

Source: Jalkanen et al. (2022)

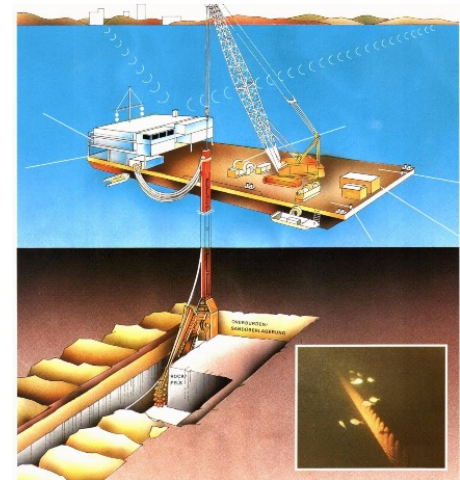
Submarine telecommunication cables

traffic up 20,000x since 1990

handle 99.5% of all communications traffic



Credit: TeleGeography, submarinecablemap.com



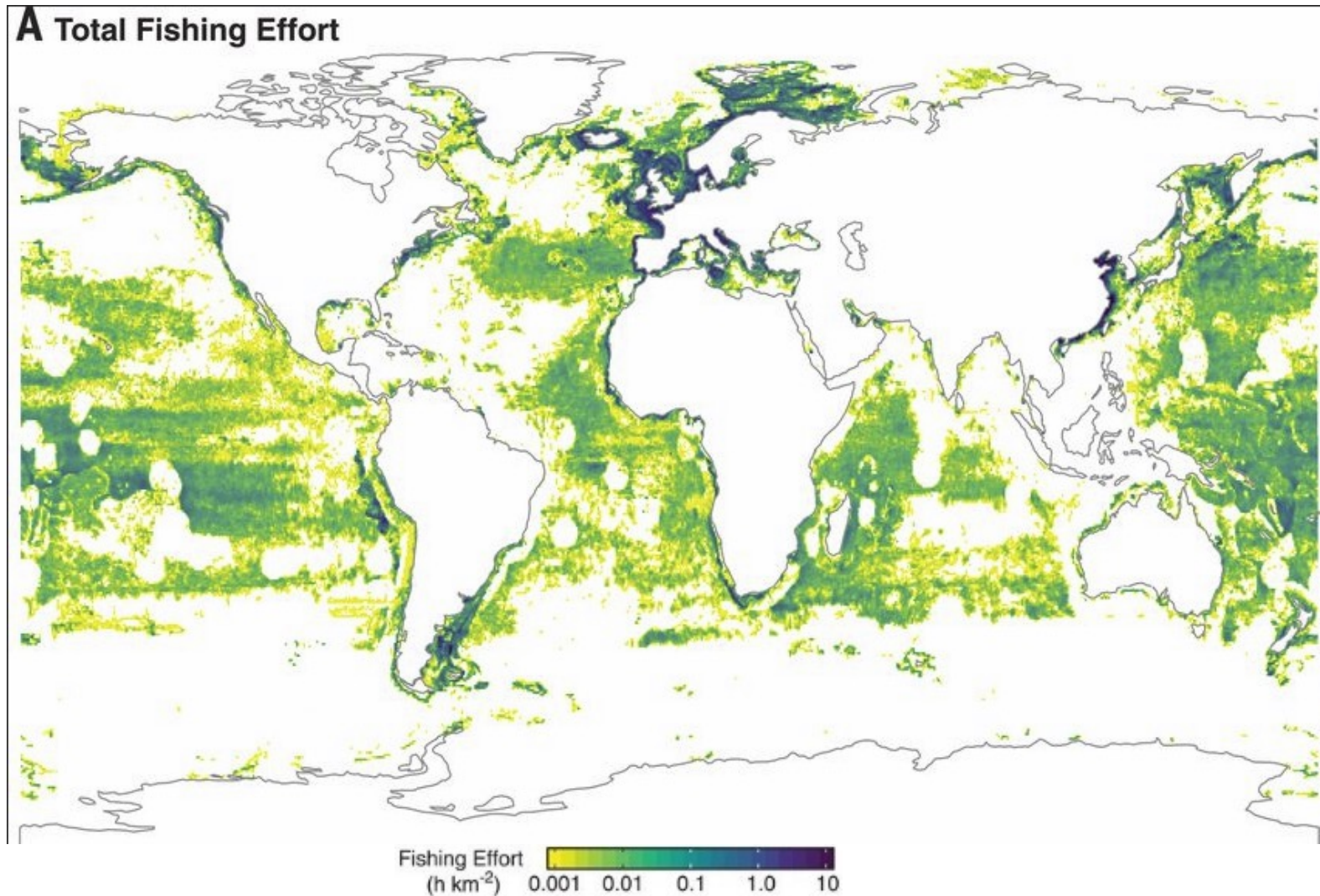
<http://www.miahtrenchers.com/page6.html>



<https://www.facebook.com/subcablenews/>

Lots of trenching for electric cables for windfarms as well as for telecom

Global extent of commercial fishing: everywhere not forbidden



Total fishing effort [hours fished per square kilometer (h km^{-2})] in 2016 by all vessels with AIS systems
Credit: Kroodsma, David A., et al. "Tracking the global footprint of fisheries." *Science* 359.6378 (2018): 904-908.

Aquaculture in coastal China

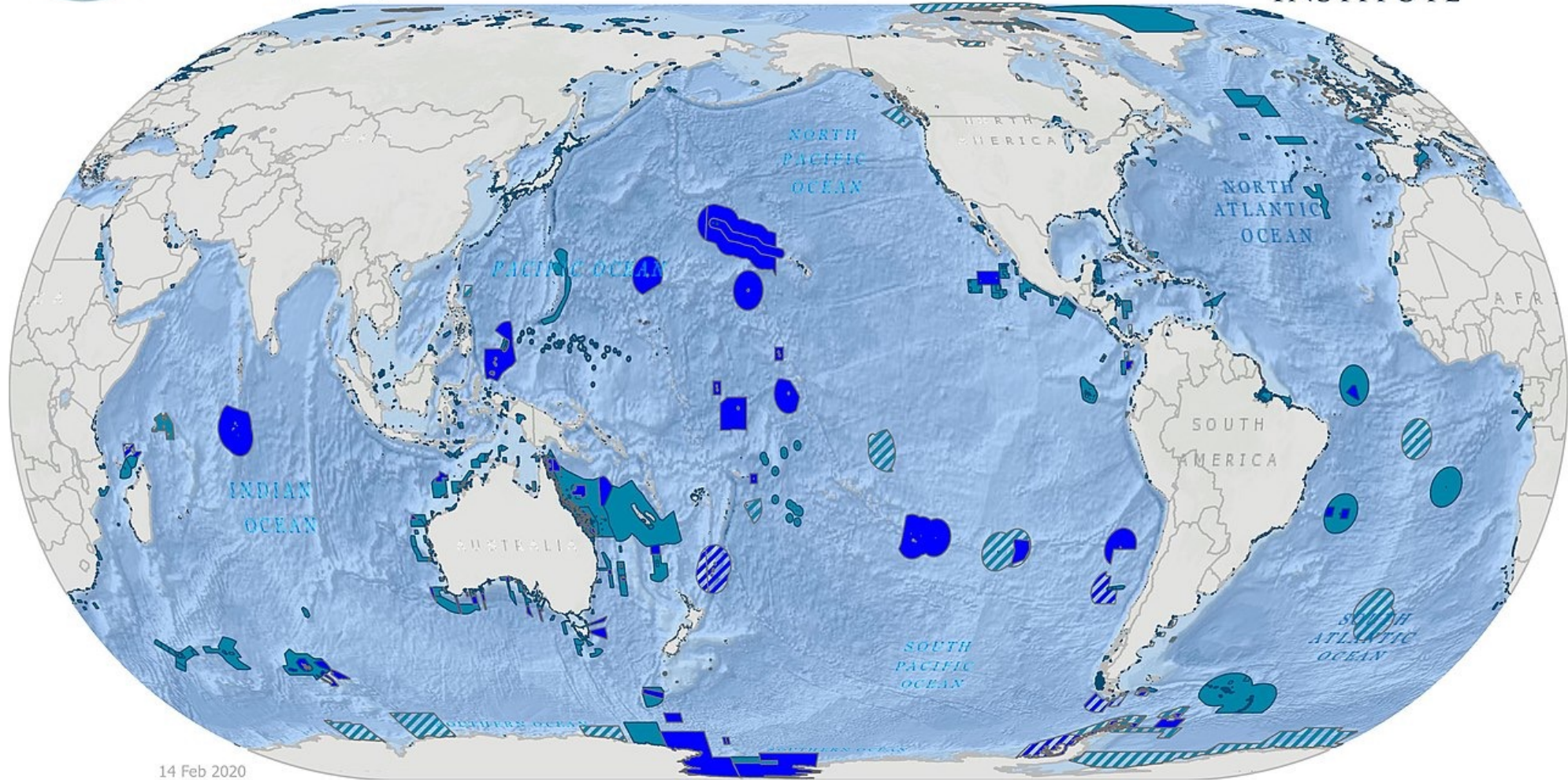
oyster farming, Luoyuan Bay, Fujian Province







Credit: Edward Burtynsky



Marine Protected Areas (MPAs), various levels of protection, implemented and unimplemented



 Implemented - Highly/Fully Protected
 Implemented - Other MPAs

 Unimplemented - Highly/Fully Protected
 Unimplemented - Other MPAs

a) Tracked daily locations of major marine predators within exclusive economic zones of 37 countries and the high seas of the Pacific Ocean. Some species travelled across the Pacific, and all species entered numerous jurisdictions.

b) Mean position of major guilds (from left):
 tunas
 pinnipeds (seals, sea lions)
 sharks
 seabirds (albatrosses, shearwaters)
 sea turtles
 cetaceans (blue, fin, sperm and humpback whales)

Source: Barbara Block et al., *Nature*

