

The Ecological Impacts of Shipwreck Survivor Camps in the Northwestern Hawaiian Islands



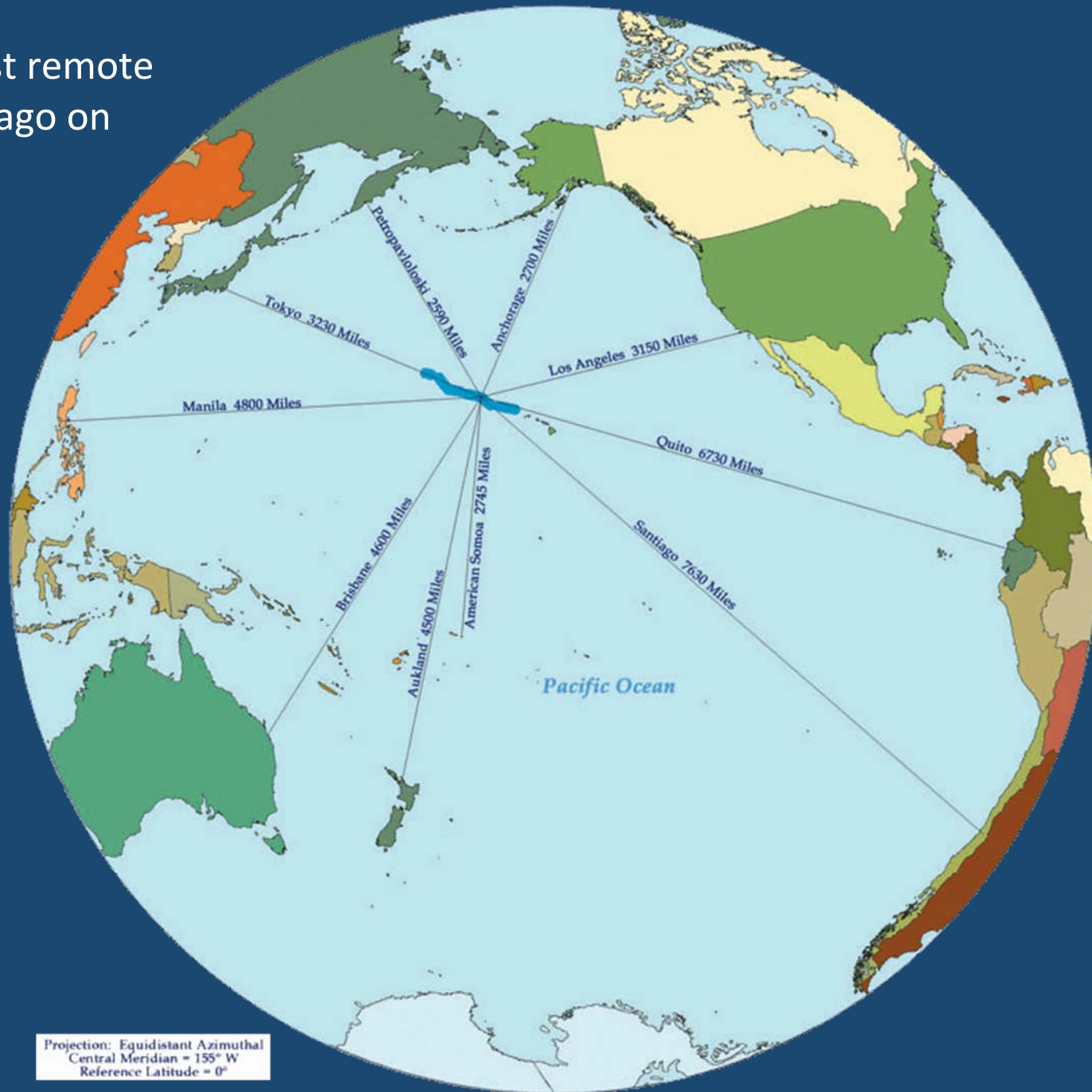
John N. (Jack) Kittinger, Lead Scientist, Impact Assessment, Inc.

Kelly Gleason, Papahānaumokuākea Marine National Monument

Jason Raupp, Department of Archaeology, Flinders University, Australia

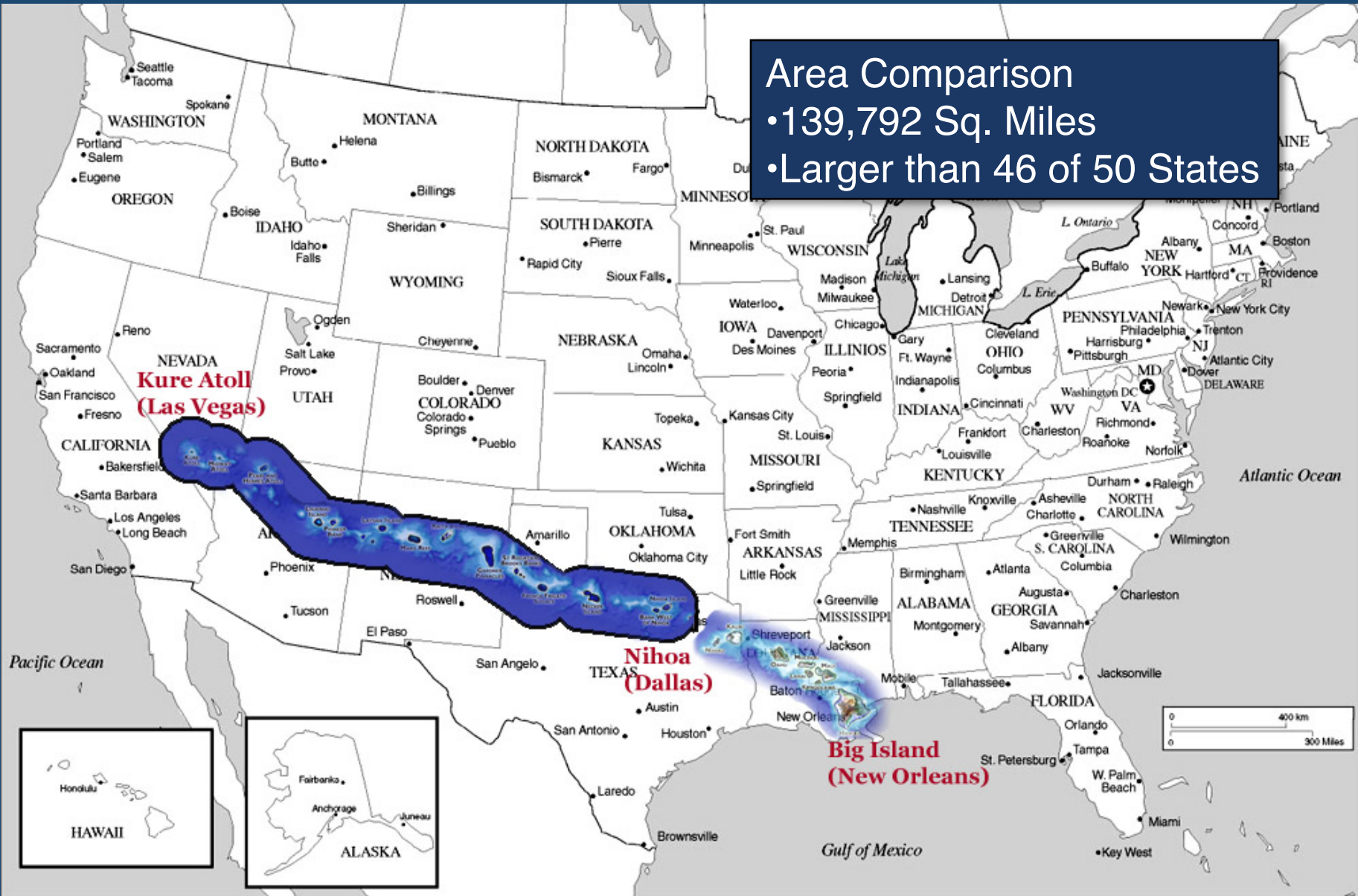
22nd Annual Symposium on Maritime Archaeology and History of Hawai'i and the Pacific
18-21 Feb. 2011: Hilo, HI

The most remote
archipelago on
Earth



Area Comparison

- 139,792 Sq. Miles
- Larger than 46 of 50 States



Map of the USA with the Hawaiian Archipelago overlaid. Black outline shows the boundary of the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve, which is 1200 Nautical Miles long by 100 Nautical Miles wide and has an area roughly the same size as Florida and Georgia combined, or 131,800 square statute miles.

Papahānaumokuākea Marine National Monument

Encompassing ~ 140,000 mi²,

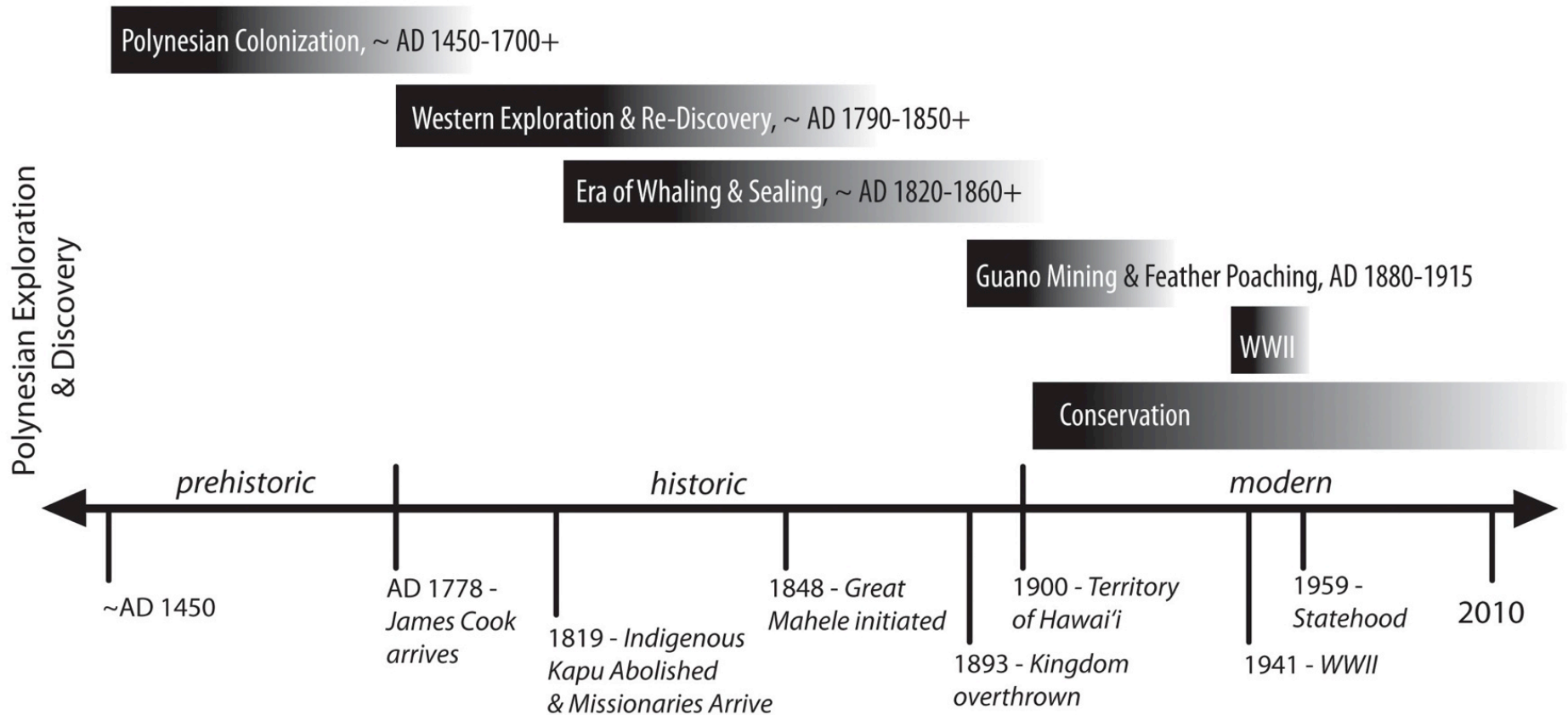
Largest conservation area in the US

Incorporates both land and sea areas

Utilized a law never before used for marine protection



Timeline of Human Interactions with the NWHI



19th century whaling in the Pacific Region

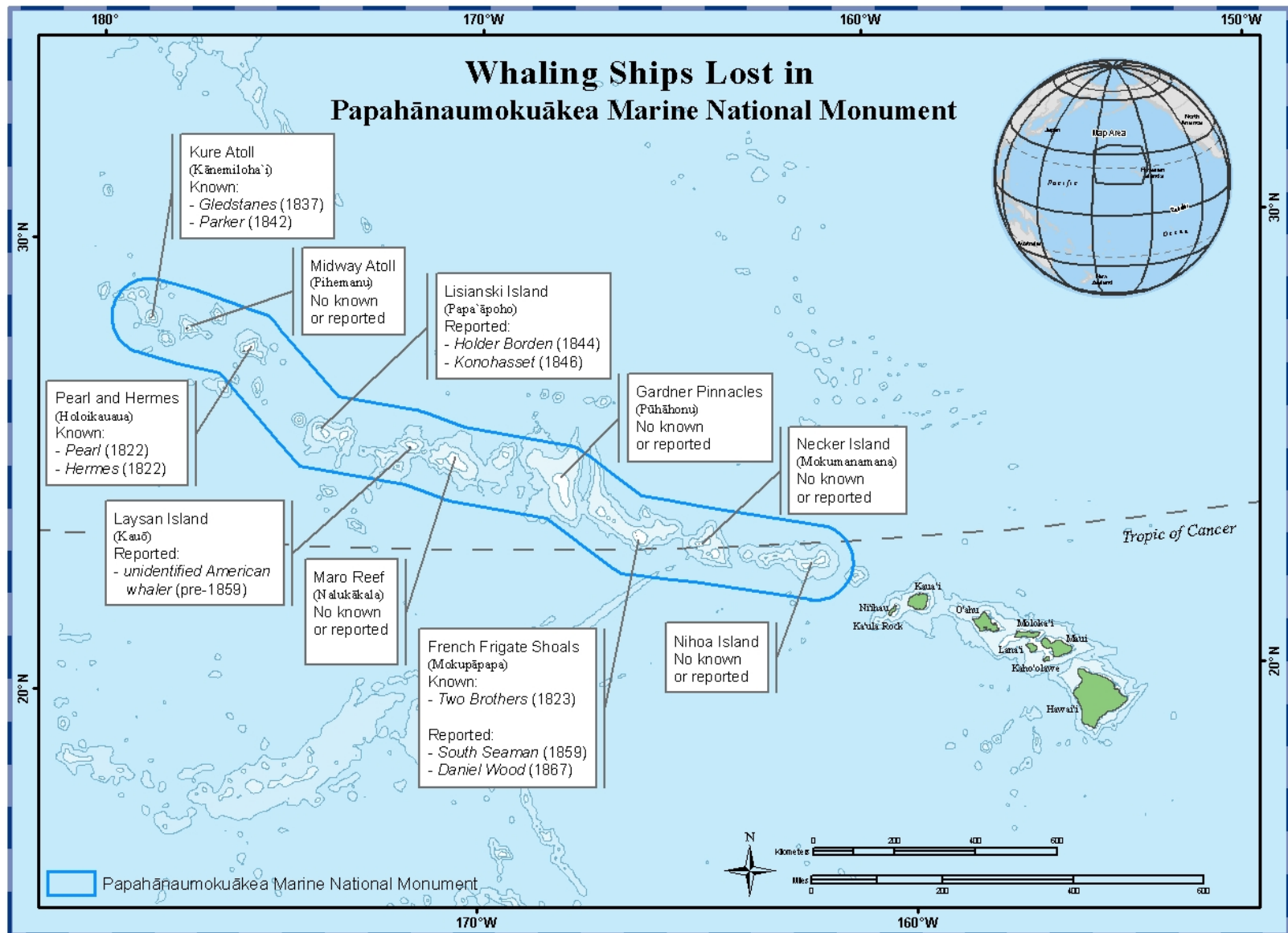




19th century sperm whaling grounds of the Pacific

Map courtesy J. Raupp

Locations of wrecked whale ships in the Papahānaumokuākea Marine National Monument



SHIPWRECK SURVIVOR CAMPS

Daniel Wood

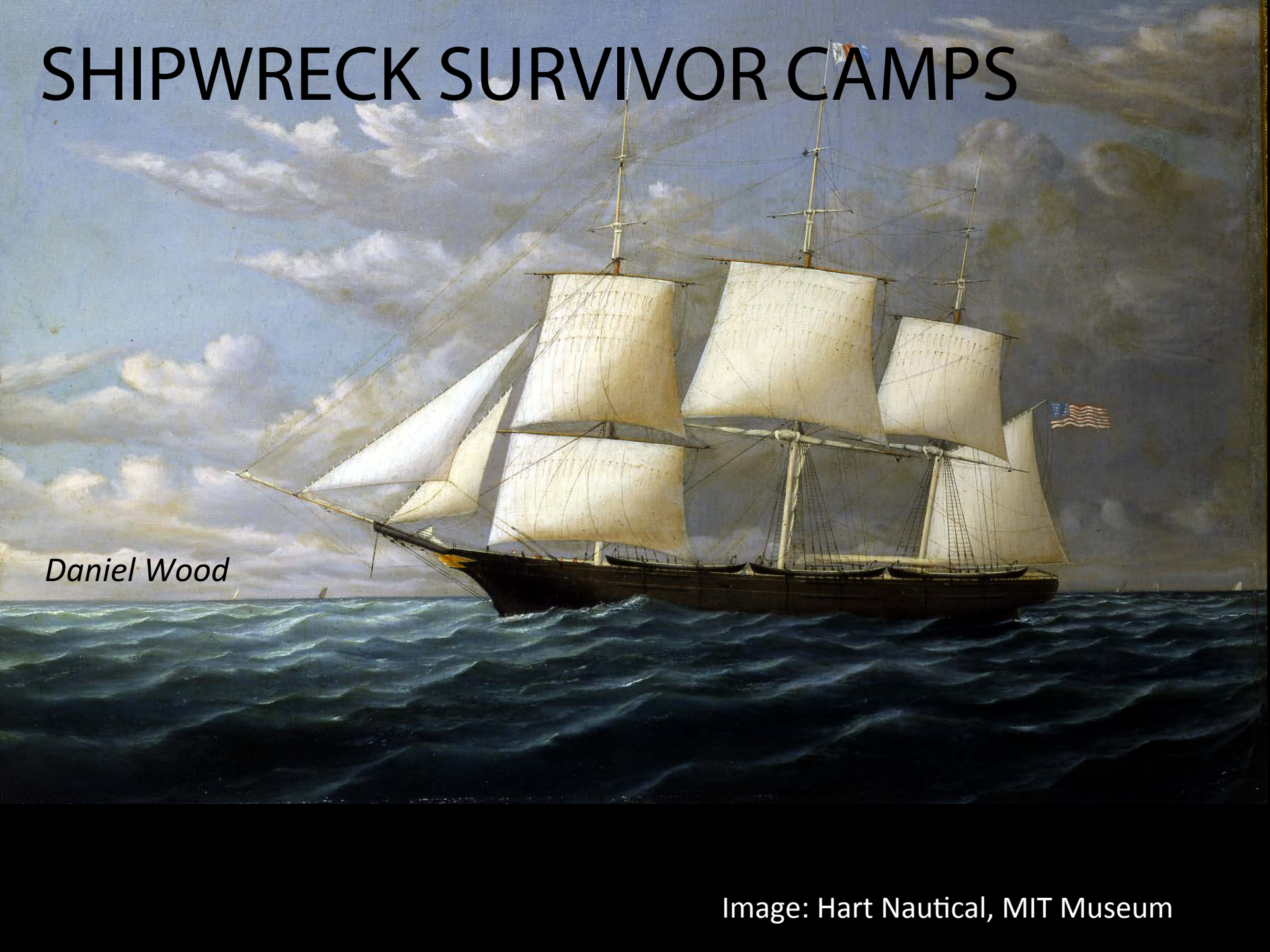
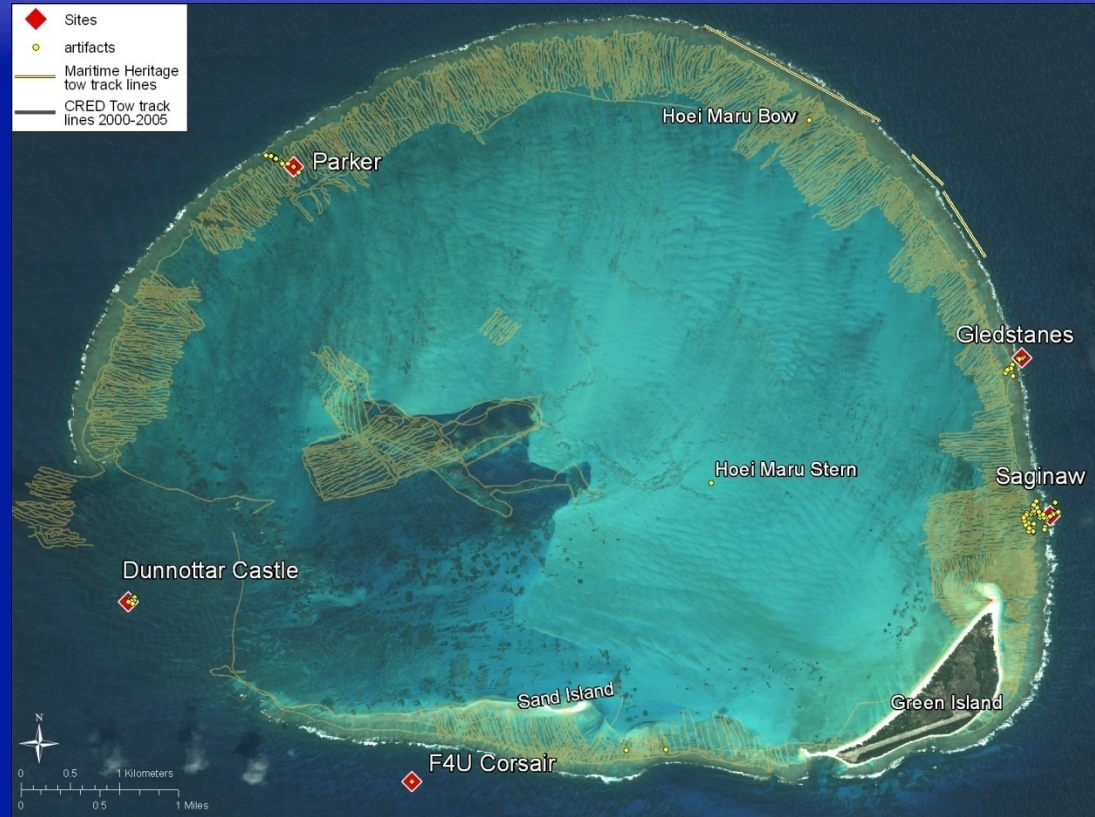
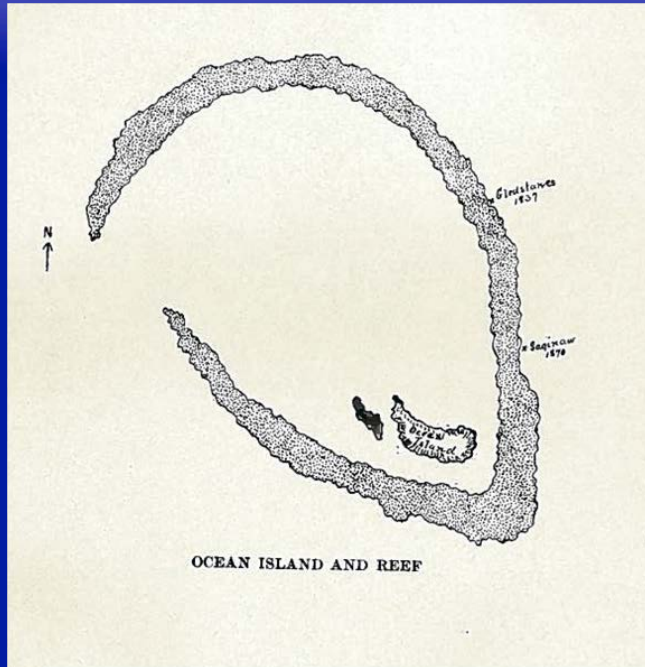
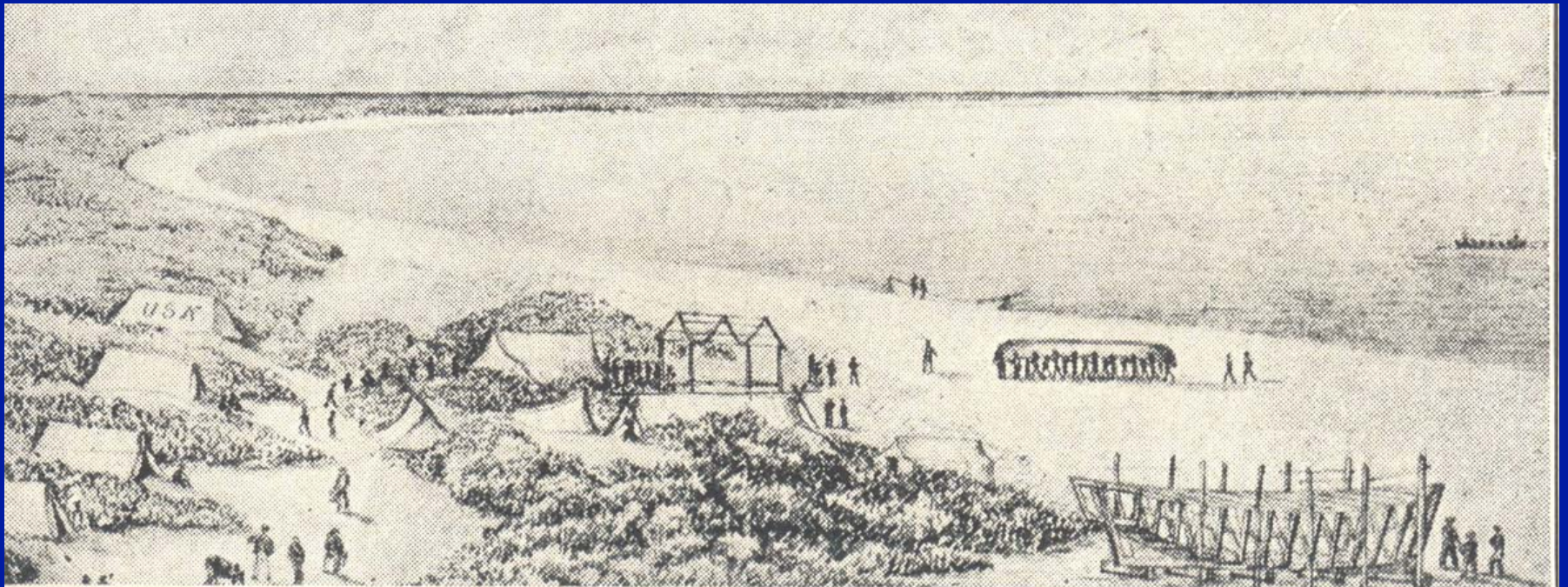


Image: Hart Nautical, MIT Museum

First Maritime Heritage Observations Made by Shipwrecked Sailors



Life in a Shipwreck Survivor Camp

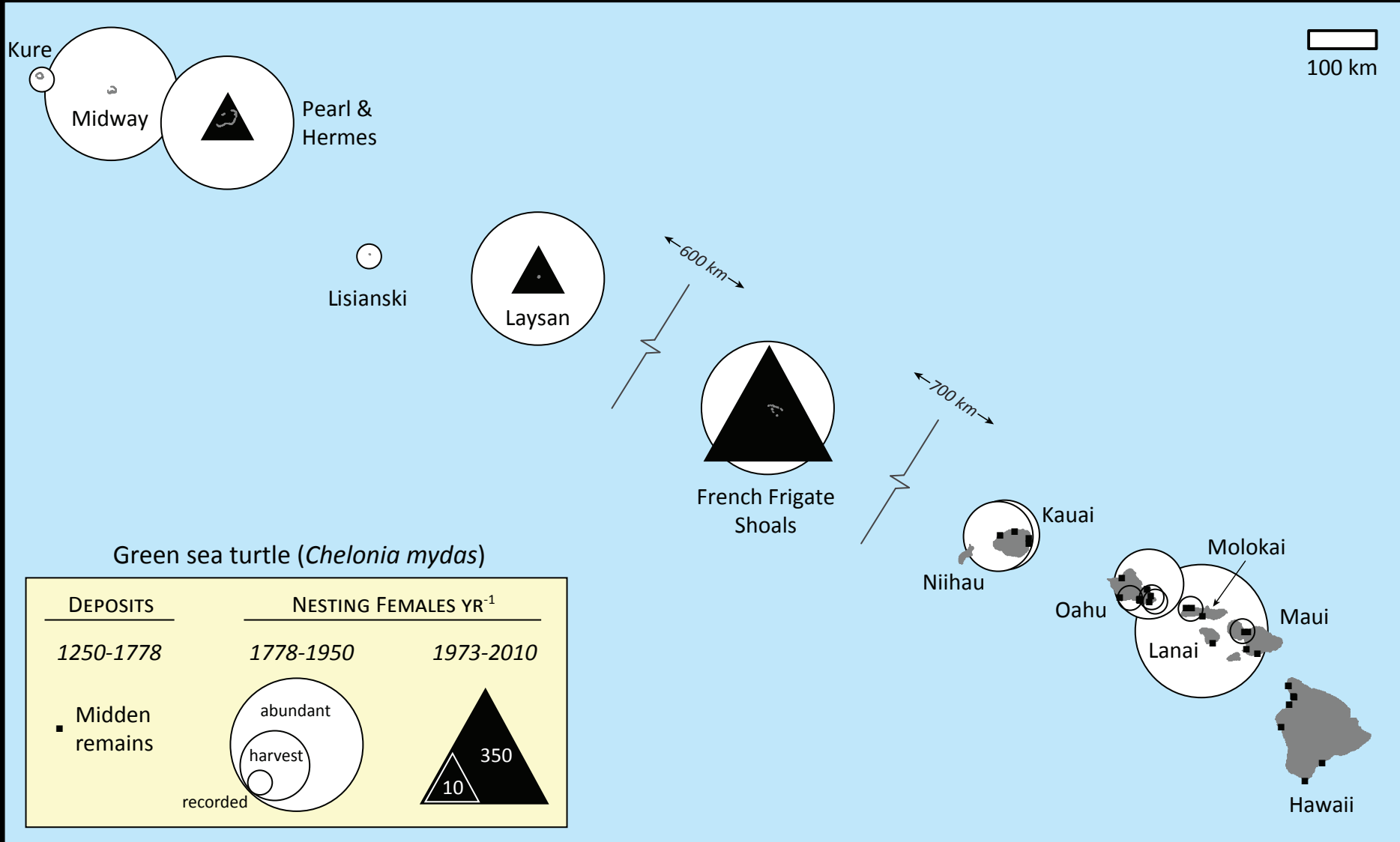


What is the Ecological Impact of Shipwreck Survivor Camps?

“On one of our explorations we found a plank... which we instantly recognized as part of the *Wandering Minstrel* wrecked at Midway... The site of the restaurant was unmistakable; they must have enjoyed turtle, to judge from the hundreds of the upper shells we found there. From their account of their experience they had a gay and festive time, and brought away dried fish and shark fins enough to start them in life again ”

Walker 1909

Historical Biogeography of Green Sea Turtles in Hawai'i



Determining the Ecological Impact of Shipwreck Survivor Camps

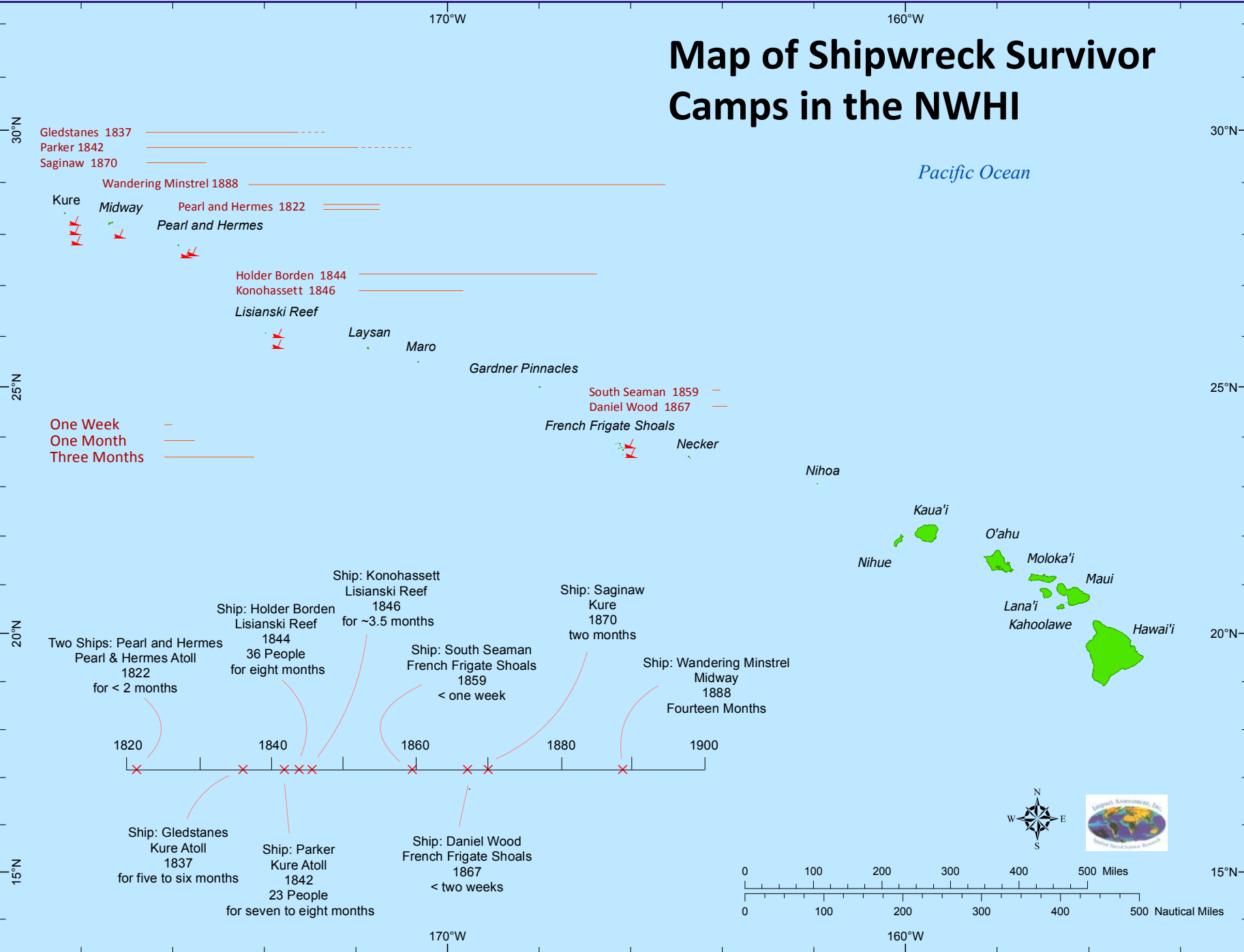
Steps to Estimate Ecological Impact:

1. Spatially-rectified comprehensive list of known shipwreck survivor camps in the NWHI
2. Obtain detailed evidence for a few shipwrecks that we can use to extrapolate to other shipwreck camps about which we know little.
Candidates: *Wandering Minstrel, Saginaw, Gledstones*
3. Ecological vulnerability criteria to estimate the impact on specific species and populations

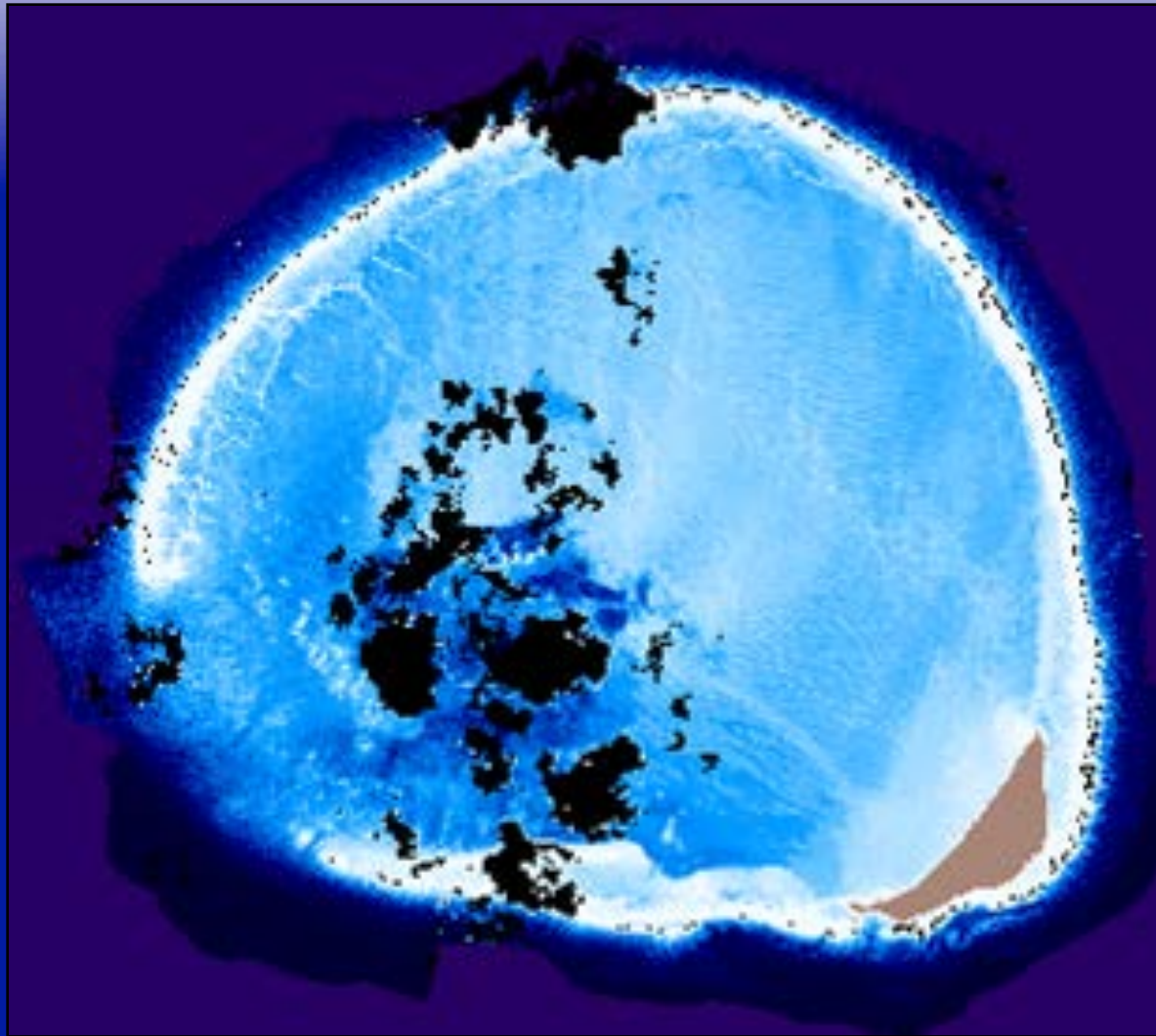
Shipwreck Survivor Camps

Ship	Wreck location	Year	Time on island	# People
<i>Pearl</i>	Pearl & Hermes Atoll	1822	< 2 months	
<i>Hermes</i>	Pearl & Hermes Atoll	1822	< 2 months	
<i>Gledstanes</i>	Kure Atoll	1837	5-6 months (JR) / 8-9 Months (LM)	
<i>Parker</i>	Kure Atoll	1842	7-8 months	23
<i>Holder Borden</i>	Lisianski Reef	1844	8 months	36
<i>Konohasset</i>	Lisianski Reef	1846	~ 3 1/2 months	
<i>South Seaman</i>	French Frigate Shoals	1859	< 1 week	
<i>Daniel Wood</i>	French Frigate Shoals	1867	< 2 weeks	
<i>Saginaw</i>	Kure	1870	2 months	
<i>Wandering Minstrel</i>	Midway	1888	14 months	

Map of Shipwreck Survivor Camps in the NWHI



Kure Atoll

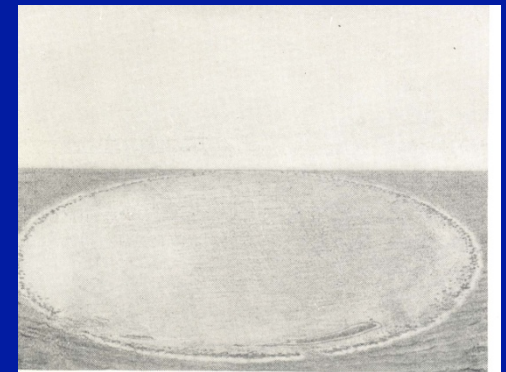


← 6 miles →

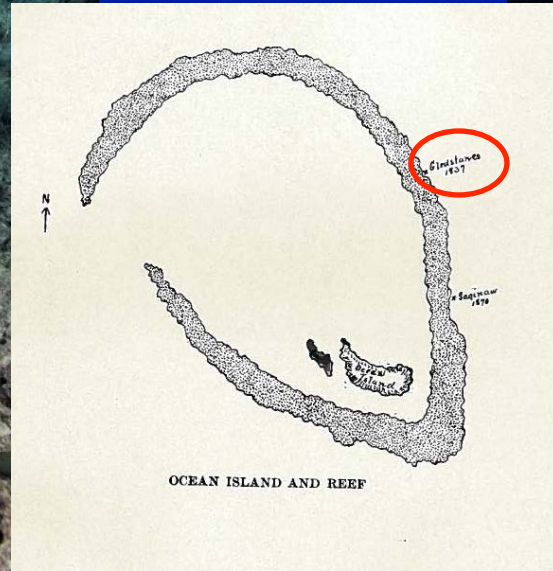
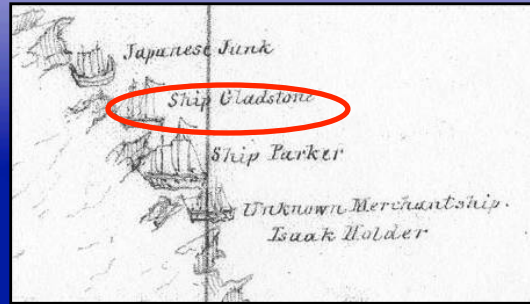


Recorded losses:

<i>Gledstanes</i>	1837
<i>Parker</i>	1842
<i>USS Saginaw</i>	1870
Japanese junk	unknown
<i>Dunottar Castle</i>	1886
<i>Hachinohe Maru</i>	1938
Naval aircraft	1945
<i>Hoei Maru</i>	1976

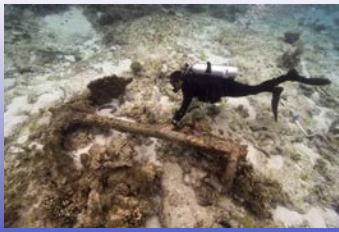


British Whaleship *Gledstanes*

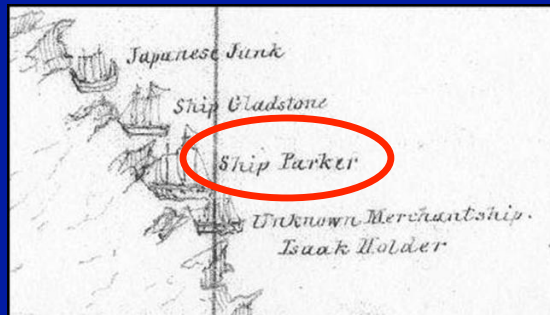


Lost on June 9, 1837
Vessel *Deliverance* built from
the wreckage

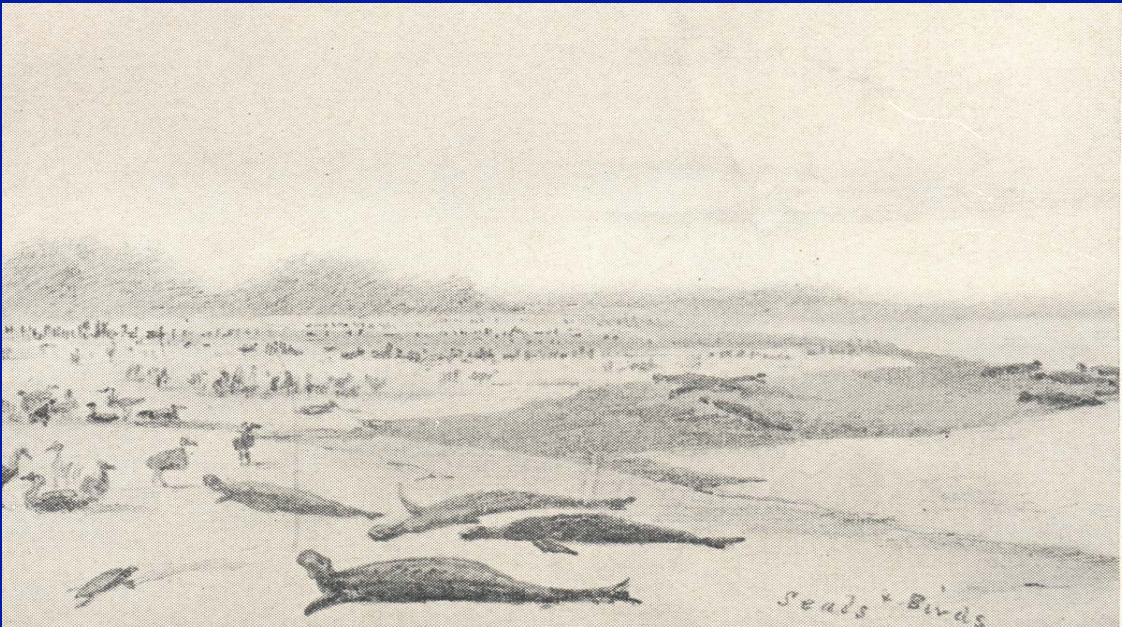
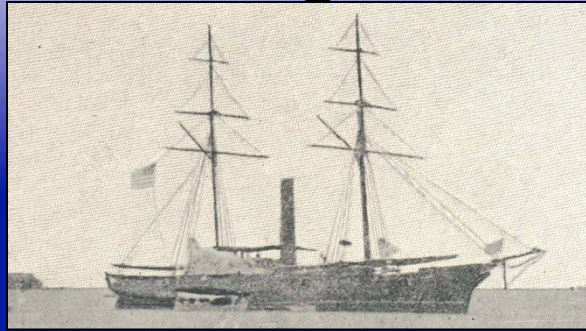
Whaleship *Parker*



Built: 1831 New Bedford
Tonnage: 406
Lost during a fierce
storm in 1842, crew
stranded for 7 months



USS *Saginaw*



- US Navy Sidewheel Steamer
- Wrecked on the reef at Kure Atoll in 1870
- Carrying hardhat divers to blast a channel at Midway Atoll





Dunnottar Castle



- built 1874 in Glasgow, Scotland
- 1,702 ton 3-masted iron sailing ship, a collier
- lost June 9th, 1886, due to faulty chronometer
- 52-day open boat voyage to Kalihi Wai, Kaua`i
- remaining crew taken by ship *Birnam Wood* to Valparaiso
- joint Hawaiian/British charter of *Wai`ale`ale* (rescued 3 dogs)
- possession by Kingdom of Hawai`i, “life protecting” station constructed



USS *Saginaw* survivor camp survey at Kure Atoll



USS *Saginaw* survivor camp survey at Kure Atoll



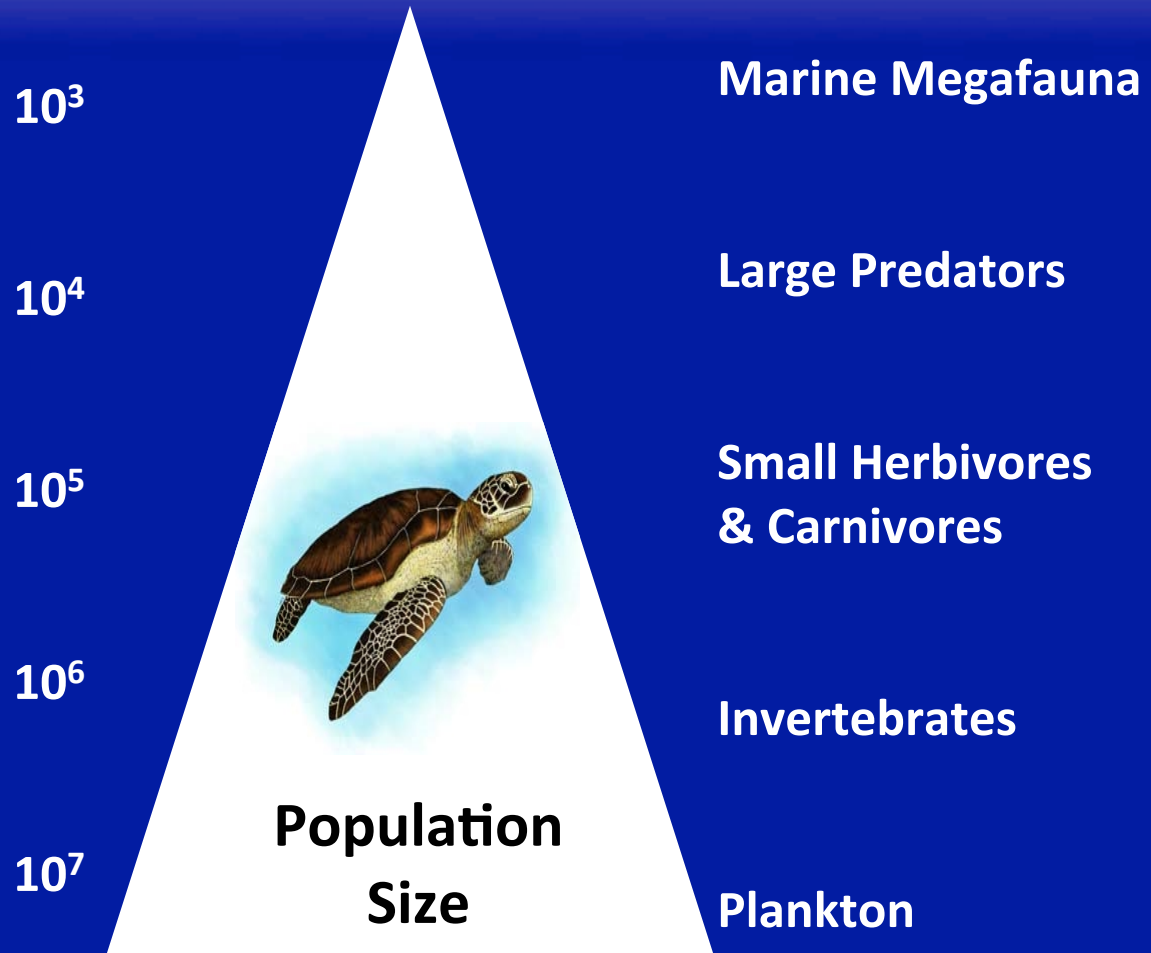
USS *Saginaw* survivor camp survey at Kure Atoll



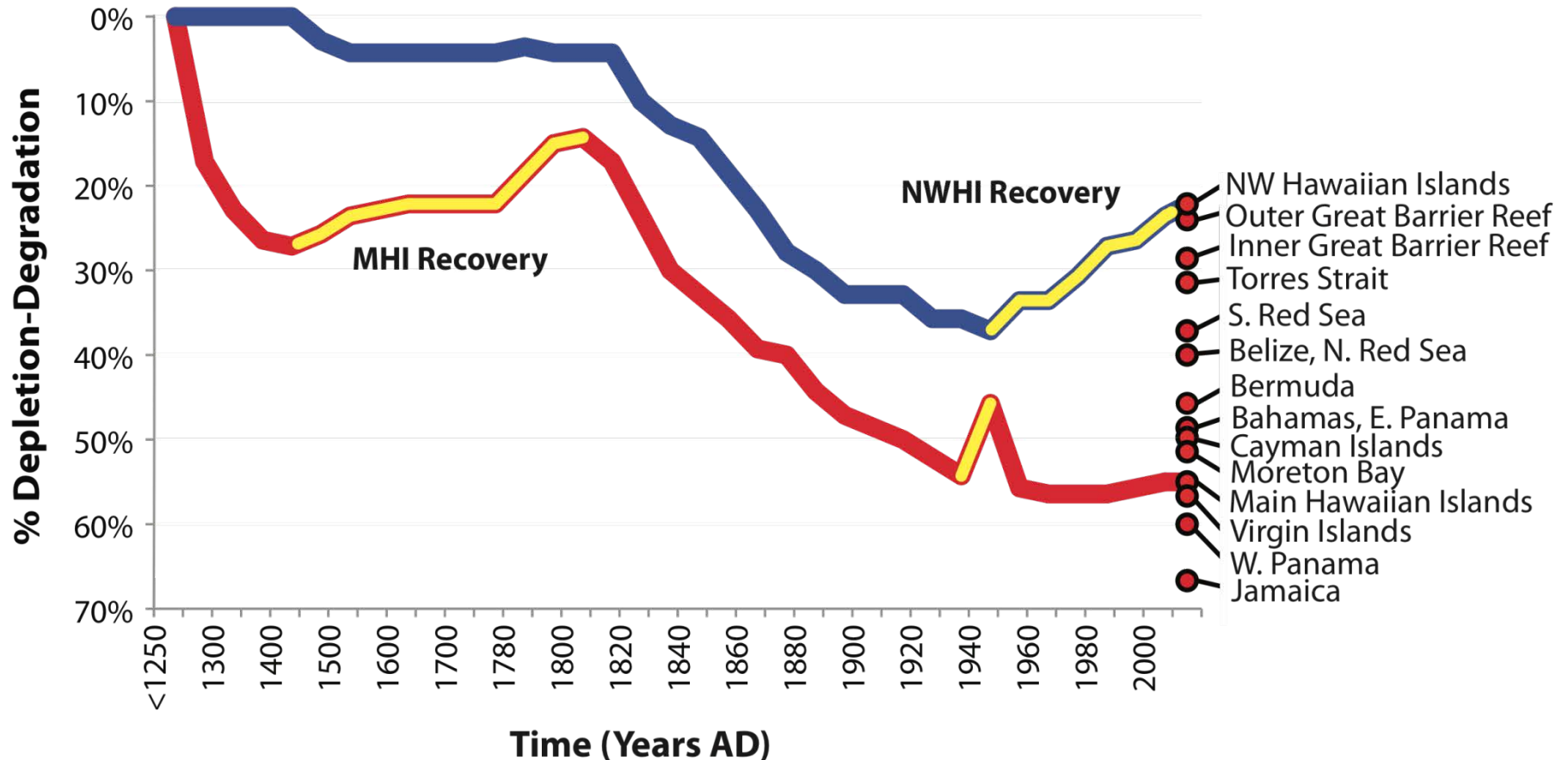
Assessing Ecological Vulnerability

Criteria:

- Functional impact
- Scale
- Frequency
- Resistance
- Recovery time

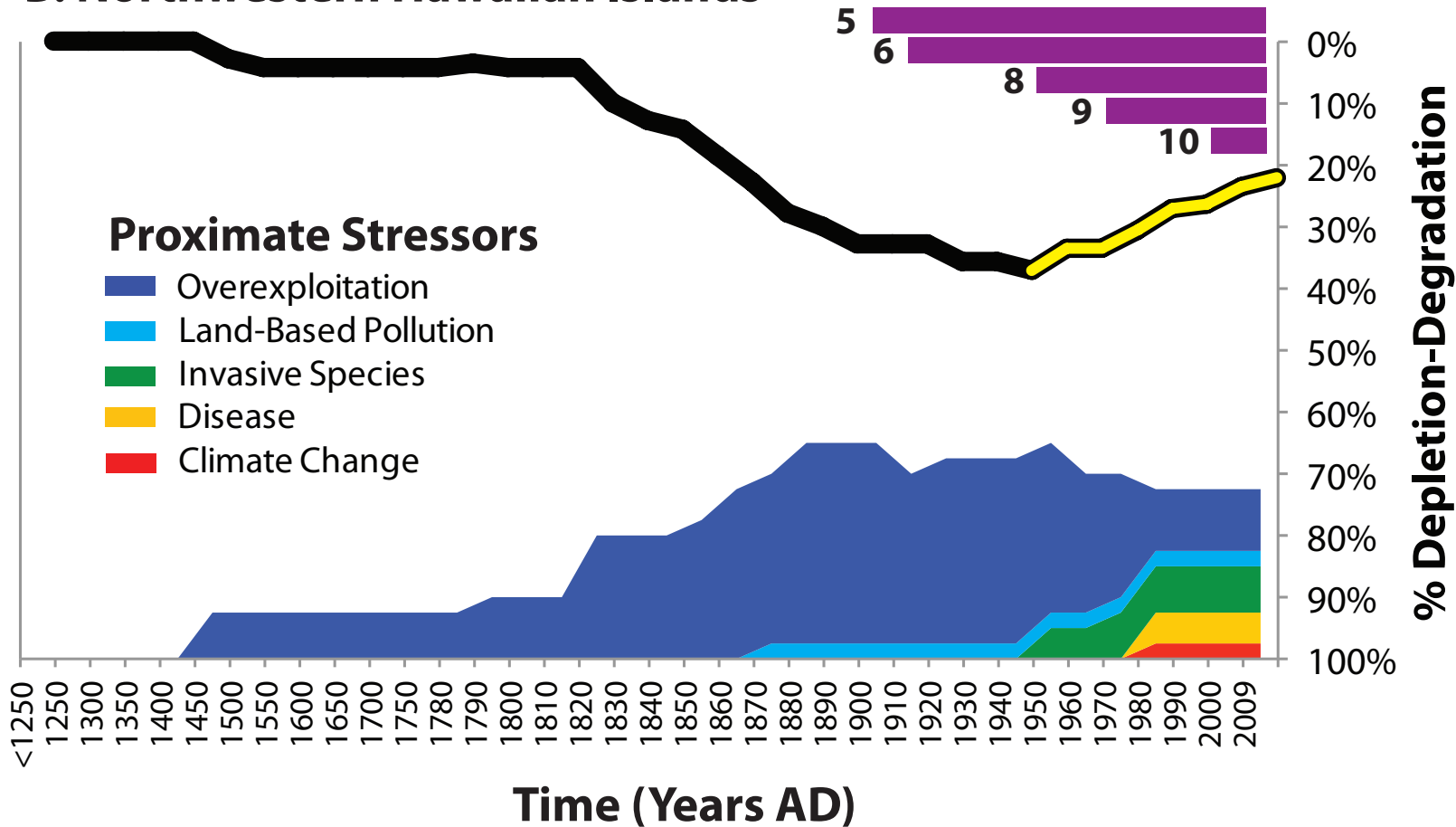


Historical Trajectories of Ecosystem Change



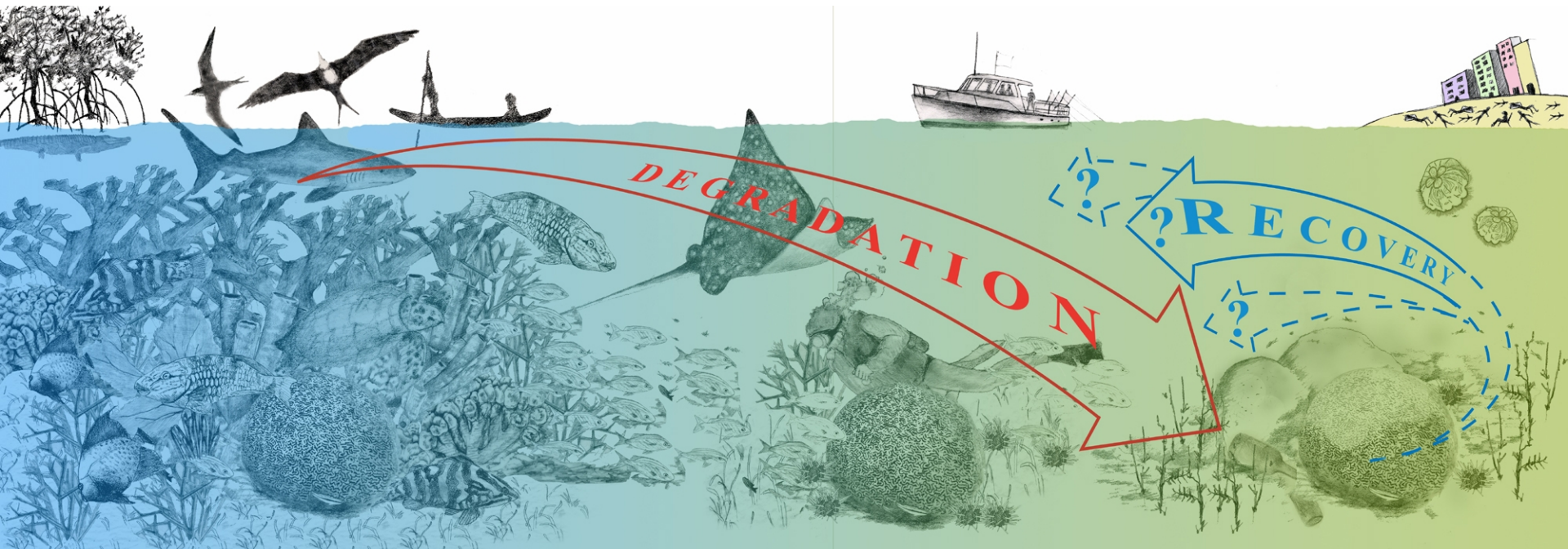
Collaborators: John M. Pandolfi ; Jonathan H. Blodgett, Terry L. Hunt, Hong Jiang, Kepā Maly, Loren E. McClenachan, Jennifer K. Schultz, Bruce A. Wilcox

B. Northwestern Hawaiian Islands

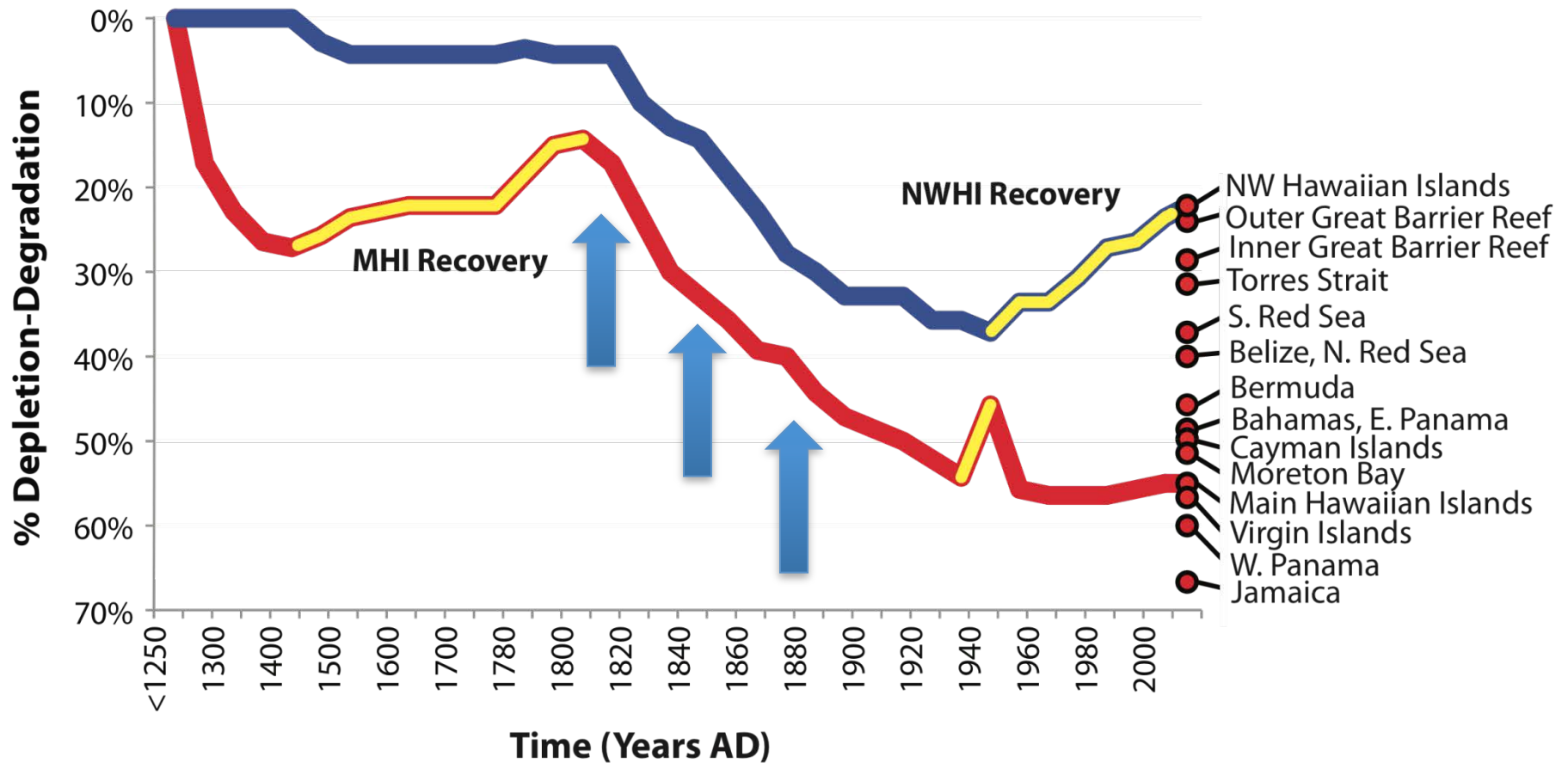


> 1250	Limited human habitability; geographic isolation from economic markets	
5	1903-2009	Biological refuge established
6	1915-2009	Exclusion of foreign commercial interests
8	1950-2009	Human depopulation; Constriction in the ecological breadth of NWHI fisheries
9	1970-2009	Terrestrial ecological restoration
10	2000-2009	Major environmental protections are put in place for reefs in the NWHI

The slippery slope to slime



Determining Restoration Goals



Mahalo



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