

Canoes as a form of Environmental Science

"Routed & rooted." A people of movement & deeply connected to place. Over centuries, Pacific peoples had long-distance voyages over thousands of miles without compasses, maps, or sextants--simply with the knowledge they had built over generations in relationship with land, sea & sky. Canoes & voyaging rely on interdependence, an understanding of nature & deep respect that cultivates sustainability. These Indigenous ways of existing with the world center the future, building for the generations to come.

Sky

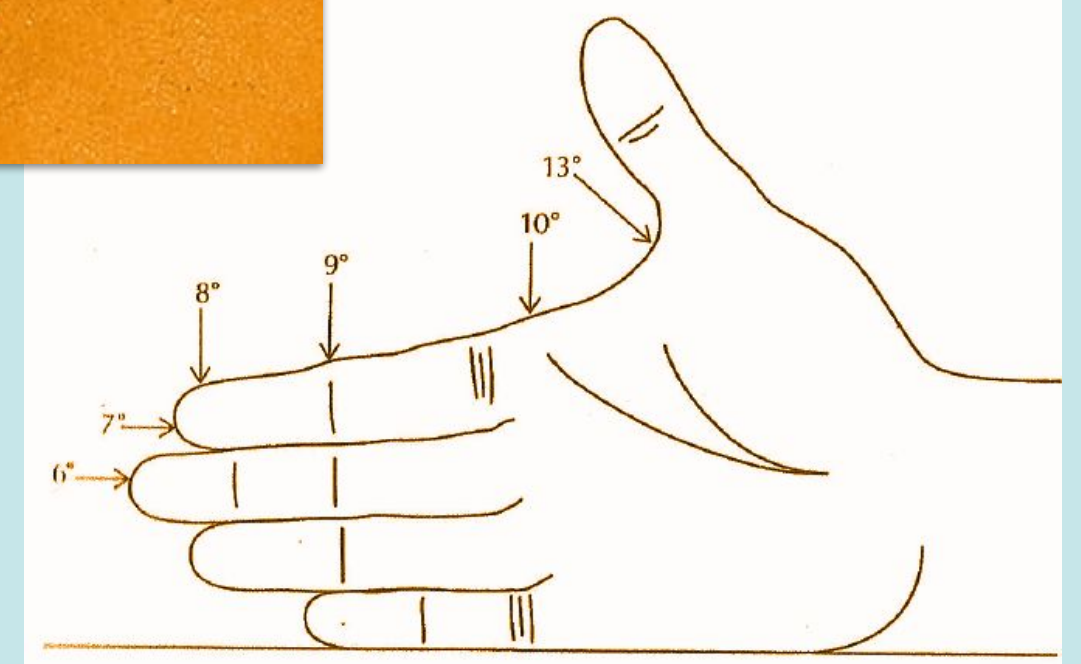
O na hoku no na kiu o ka lani (The stars are the eyes of the heavens) ~Hawaiian proverb

The stars' positions & movements are an important part of navigation, offering the ability to measure distance & latitudinal location. Navigators internalize a **star map** & use their bodies to locate known constellations in the sky. Groups of stars are associated with specific islands, which helps in locating oneself in the ocean.

During the day, the sun & clouds are just as important to predict weather patterns & direction.



(left) Satawalese star map. Shells represent specific constellations, splitting the circle into 32 'houses.' Each one was 11.25° & the degrees translated into miles (1° = 60mi). Distance could be measured with hands referencing degrees (below)



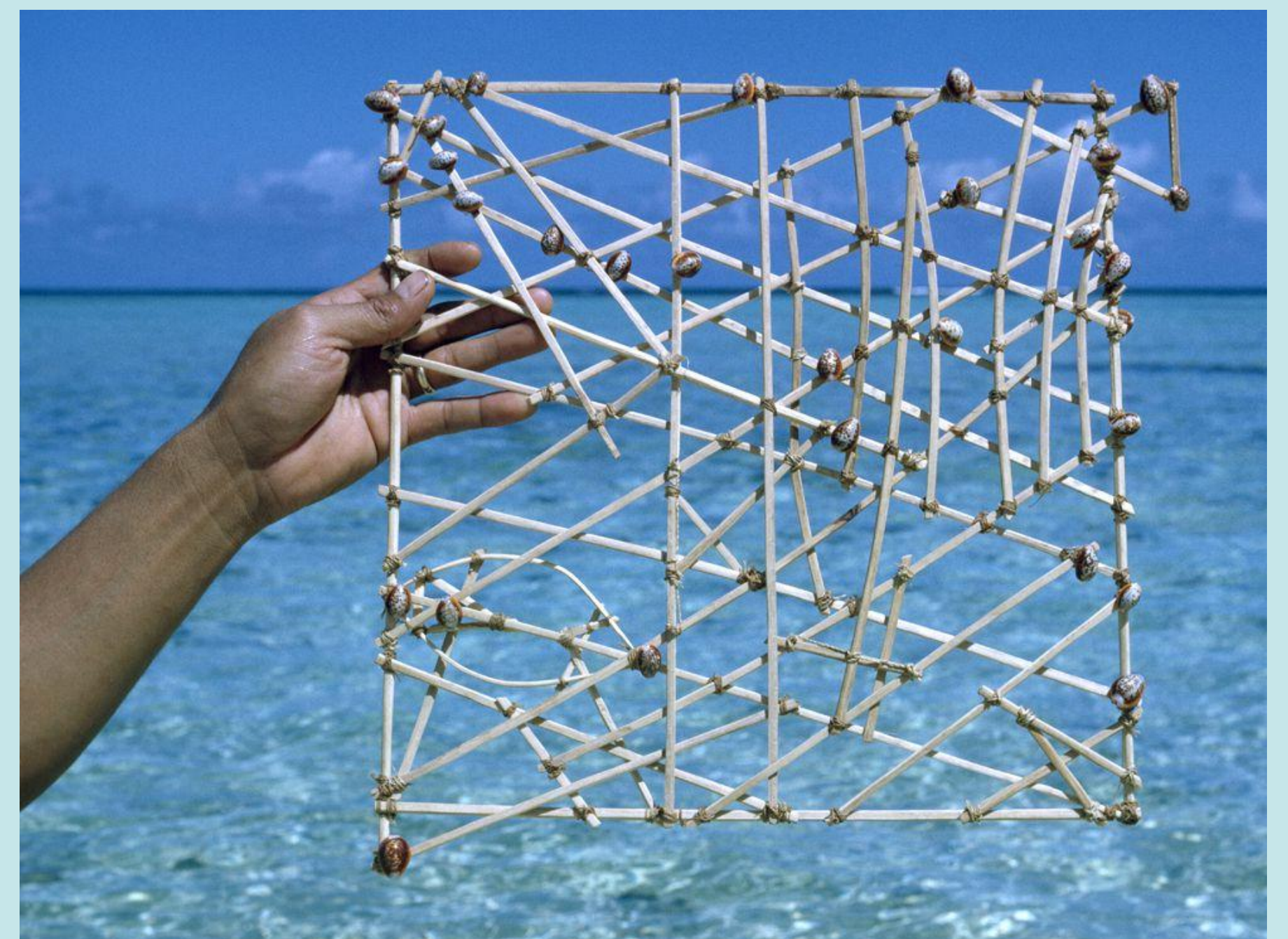
Sea

He lawai'a no ke kai papa 'u, he pokole ke aho; he lawai'a no ke kai hohonu he loa ke aho (A fisherman of shallow seas uses only a short line; a fisherman of the deep sea uses a long line) ~Hawaiian proverb

Wave-piloting is an Indigenous form of mapping of the ocean that highlights the intellectualism of our bodies, as it requires the use of all senses. Pacific navigators had to have deep familiarity with wave rhythms--the way they hit the boat--as well as patterns in the water, listening & feeling.

Stick charts are tools used to assist in the understanding of water movement. The shells on the stick charts represent known local land masses & the sticks represent the direction of waves coming off the land masses. By triangulating & observing how waves moved in relation to the canoe's position, one could determine where they were in the ocean.

Example of a Marshallese stick chart



Land

Aloha Aina (Love the Land) ~Hawaiian proverb

Breadfruit trees are a main crop of the Pacific Islands used for canoe building. Trees were planted on the leeward & windward side of islands; those on the leeward (shielded from oceanic winds) would grow straight, whereas those on the windward side would grow curved & be suitable for parts like the hull. This intentional stewardship ensured healthy soils, cultivated an awareness of (over) harvesting & a responsibility to care for land.

Animals were also critical to voyaging. **Pookof** is a form of land-finding that relies on knowing all fauna native to a given island & their accompanying behaviors. Birds often indicated an island nearby & Ikelap fish were native to eastern Guam.



Yapese man carving canoe out of a breadfruit trunk which can be seen on the left.

