Seaweed Futures: Designing a Zero Carbon Exhibition

Project Description

Seaweed Futures: Designing a Zero-Carbon Exhibition is a Vertically Integrated Project at Stony Brook University directed by Sohl Lee, an art historian and curator whose work centers ecology, Indigenous knowledge, and material culture, and who was an artist-in-residence at Ma's House in October 2024. The project brings together students across disciplines and academic levels to explore seaweed as both ecological material and cultural medium. Working with food-grade agar, dried agar (*Gelidium amansii*) from South Korea, and sugar kelp (*Saccharina latissima*) cultivated by the Shinnecock Kelp Farmers, the team conducts small-scale experiments in plant-based bioplastics as alternatives to petroleum-based materials.

In Spring 2026, media and sound artist Esteban Agosin Otero led the team's initial material experiments, guiding students through recipe development, heating protocols, casting techniques, and iterative testing. At this stage, the work is exploratory. We test how variations in agar, kelp fiber, glycerin, and water affect flexibility, opacity, shrinkage, and durability—treating experimentation itself as research.

The team aims to connect Indigenous knowledge, environmental humanities, material science, and exhibition practice. Over the next two years, members will continue material testing while developing the conceptual groundwork for a small-scale, low-carbon exhibition centered on seaweed's ecological and cultural dimensions.

Team: Cornell Barnes, Geneva Bhagroo, Juliana Brown, Emma Castillo, Fiona Chen, Shirley Chen, Nikita Cook, Anna Corso-Rosas, Sam Crane, Dylan Farrell, Hui-Ching Hsu, Umi Joshi, Kloey Kun, Sabrina Li, Sohl Lee, Kaitlyn Loo, Julie Randall, Andrew Tai, Vincent Tortorella.

Labels

Seaweed Futures
Square One
Food-grade agar agar powder; Agar (Gelidium amansii); Shinnecock Kelp (Saccharina latissima); hibiscus; turmeric; sea lettuce (Ulva) powder; water; glycerin.

On February 12, 2026, under the direction of media and sound artist Esteban Agosin Otero, the team tested four bioplastic recipes using petri dishes as molds. Each batch was measured, boiled, stirred, and poured with precision. The final remaining mixture was cast onto plexiglass and activated through improvisation—sprinkled with shredded Shinnecock kelp, sea lettuce powder, and turmeric. *Square One* marks the beginning: experimentation before refinement. These early sheets record viscosity, thickness,

translucency, and failure. They foreground process over product—an inquiry into how seaweed might become surface, skin, or substrate.

Seaweed Futures
Kelp Cartography: Shinnecock Bay

Food-grade agar powder; Agar (Gelidium amansii); Shinnecock Kelp (Saccharina latissima); water; glycerin.

This work maps Shinnecock Bay through seaweed itself. Whole agar strands, powdered agar, and shredded sugar kelp form the surrounding waters, inspired by the Shinnecock Kelp Farmers' aspiration to cultivate sugar kelp throughout the Bay. Seaweed is largely composed of water and absorbs nutrients directly through its entire body. It filters, grows, and reshapes marine environments; some kelp species can grow several feet per day under optimal conditions. Here, cartography becomes material—the bay rendered not in blue pigment, but in marine substrate.

Seaweed Futures
Kelp Cartography: Long Island
Food-grade agar agar powder; Agar (Gelidium amansii); Shinnecock Kelp (Saccharina latissima); hibiscus; turmeric; water; glycerin.

Five seaweed-based substrates compose the silhouette of Long Island. Seaweed forms the base of marine food webs and plays a vital role in oceanic ecosystems that sustain life both in water and on land. By shaping Long Island from marine matter, the work suggests an ecological inversion: the land is supported—materially and metaphorically—by the sea.

Seaweed Futures
Seaweed Skin (Petri Dish Series)
Each circular cast functions as a controlled experiment: a study of flexibility, opacity, brittleness, and shrinkage. Because the work remains wet, mold may develop. Rather than preserving permanence, the project foregrounds material vulnerability and change.

(From top right to left)
- Food-grade agar agar powder, water, glycerin
- Food-grade agar agar with Shinnecock sugar kelp, water, glycerin
- Dried agar (*Gelidium amansii*) from Korea, water, glycerin
- Food-grade agar agar powder with turmeric, water, glycerin
- Sugar kelp (*Saccharina latissima*) from the Shinnecock Nation

- Dried agar (*Gelidium amansii*) from Korea

From Seaweed to Sovereignty: Shinnecock Kelp Farmers and Indigenous-Led Climate Solutions

October 20, 2025
Recital Hall, Staller Center for the Arts
Stony Brook University
Video documentation (50:00 minutes)

This recorded keynote and conversation features members of the Shinnecock Kelp Farmers—Danielle Begun Hopson, Donna Collins-Smith, and Rebecca Genia—discussing regenerative aquaculture and coastal stewardship on Shinnecock Territory. The event addressed seaweed not only as a sustainable material and carbon-sequestering organism, but also as a site of sovereignty, food systems resilience, and cultural continuity.

Program organized and moderated by Sohl Lee, Associate Professor of Art History at Stony Brook University.

Co-sponsors: Sir Run Run Shaw Endowment; Native American and Indigenous Studies; Humanities Institute at Stony Brook; College of Arts and Sciences Dean's Office; Department of Art; and Zuccaire Gallery at Stony Brook University.
Camera and editing: Tony Fabrizio
Full recording available on the College of Arts and Sciences SBU YouTube channel.

Seaweed Futures

Create Your Own Seaweed Skin

The following recipes were used in our Seaweed Futures material experiments. Each formulation can be adjusted to test how variations in agar, kelp fiber, glycerin, and water affect flexibility, shrinkage, opacity, and durability.

Heat the mixture while stirring continuously until it reaches a full boil. Pour immediately into molds or onto a nonstick surface. Allow to cool and dry.

Base Formulation

Food-Grade Agar Agar Powder

- 800 mL fresh water
- 16 g food-grade agar agar powder
- 25 g glycerin

With Shinnecock Sugar Kelp (Saccharina latissima)

- 800 mL fresh water
- 16 g food-grade agar agar powder
- 16 g Shinnecock sugar kelp (Saccharina latissima)
- 25 g glycerin

Agar (Gelidium amansii) from Korea

- 700 mL fresh water
- 10 g agar (Gelidium amansii) from Korea
- 10 g glycerin

With Turmeric

- 200 mL fresh water
- 4 g food-grade agar agar powder
- 6 g glycerin
- 1 g turmeric

Agar (Gelidium amansii) from Korea with Hibiscus

- 1000 mL fresh water
- 50 g agar (Gelidium amansii) from Korea
- 5 g hibiscus

Words from the Seaweed Futures Team

The following reflections were written by team members during the initial material experiments in February 2026. Language has been preserved as written.

Material Observation

The plastics felt almost alive in a sense: You could see the residue of kelp and occasional mold; the plastic was moist, as if it was also immersed in the ocean. — Umi Joshi

Agar agar – no color: slightly rough texture, wave pattern persists; no longer able to be moved easily, layer feels thinner; it deserves to take the form of a kaleidoscope lens because it's still mostly transparent, but would create a visual distortion effect. — Andrew Tai

Some of the residue got stuck to the surface and formed thin, clear plastic-like sheets, which was surprising as the ones in the molds were jelly-like. What really surprised me was getting to touch the mixture in the molds, and how quickly it solidified, and the drastic change in consistency as it cooled down. — Shirley Chen

After picking up and playing with the samples, my fingers left streaks on the surface, being most noticeable within the agar agar sample. These jelly-like biomaterials can keep a history of the interactions they are a part of. — Vincent Tortorella

One dish contains visible particles and debris, emitting a strong, briny scent of the ocean. This olfactory experience immediately connects the indoor lab space to the coastline. Another dish is surprisingly transparent; its absolute clarity is striking, contrasting with the typical “messy” image of raw seaweed. — Hui-Ching Hsu

Scientific & Process Reflection

We made various samples using the ratios Esteban provided and also learned that adjusting the amounts of each component would shift the material's composition and rigidity. We decided to experiment and make samples with Ulva powder, turmeric, cayenne, seaweed fibers, and Shinnecock sugar kelp. — Juliana Brown

In the first two days, the water content in three of the four samples was still pretty high. The sample with the Gelidium amansii especially stood out because the surface reminds me of the ocean frozen in time. For the turmeric sample, I wonder if it would make a difference if we add the powder at the beginning of the cooking process, letting the color “seep” more and therefore leading to a more vibrant hue. — Sabrina Li

This Korean Gelidium amansii-based mixture is very similar to the food-grade agar agar powder one as both have significantly shrunk and become paper thin. It feels completely dry and almost looks like snowflakes under a camera lens from the seaweed fibers being locked in place. — Dylan Farrell

The solution wrapped around the additives of Shinnecock sugar kelp, Gelidium amansii, and turmeric tightly, creating a variety of natural textures that differed with each petri dish, and yet a similar overall appearance which was unifying considering that these additives originated from all over the world, whether it be the Shinnecock kelp from Long Island, Gelidium amansii from Korea, or turmeric from South Asia. — Fiona Chen

Conceptual & Collective Reflection

The Gelidium amansii (actual agar from Korea) contains delicate algal particles suspended in the petri dish, as though frozen in time. I am reminded of where this algae once flourished in the sea, vibrant red in hue. Although paler now in the agar mixture, it remains flexible and pliant, a tribute to its versatile nature. — Geneva Bhagroo

This meeting made the project feel significantly more hands-on and experimental. Sohl's seaweed presentation deepened my understanding of the environmental and material significance of seaweed, particularly its role as both a sustainable biological resource and an artistic medium. It encouraged me to think more critically about the intersection of biology and design, and how a material's meaning shifts depending on its application. — Kaitlyn Loo

There is a hybrid nature of our meetings and the creation of our projects, being sort of a mixture between a science lab, creative art course, and cooking lesson, all with lots of laughs. The fluidity of seaweed, interconnection, hope, and community it inspires is something we will continue to learn and work on together, for our future. — Anna Corso-Rosas

We contemplated and worked with the beauty and remarkable properties of red agar fiber and seaweed. Through processes of striking simplicity, we rediscover seaweed's material intelligence and the ancestral knowledge and culture of the Shinnecock Nation, Korean traditions, and scientific and artistic research, inviting more conscious practices in response to the environmental crisis. — Emma Castillo