

"Water Planet" Showcases Connection Between Water and Life



Coral Reef. Photo: Tim Griffith.

SAN FRANCISCO, CA.- and life is the subject of an innovative new exhibit that will open on September 27 as part of the new California Academy of Sciences.

Silvery, sculpted walls and dramatic lighting set the scene for a unique foray into the Water Planet exhibit. Constructed using new technologies for computer-aided design and fabrication, the complex molded surfaces seemingly flow into one another, inviting touch and creating an immersive, watery setting. Fluidly-shaped openings in these walls provide windows into dozens of aquarium tanks. In the center of the room, three low islands combine additional live animal displays with interactive "touch surfaces" and innovative water elements to address the physical and chemical properties of water. The perimeter walls double as a surround-view theater screen; a five-minute movie about the central role of water on our planet plays across their surfaces once an hour.

While most aquarium exhibits are organized by geography, the live animal displays in Water Planet are grouped by adaptation to life in and around water. Along the perimeter of the exhibit, seven clusters of tanks focus on adaptations for feeding, locomotion, reproduction, defense, sensing, surviving in deserts, and living in and out of water. Animals that have evolved particularly interesting solutions to these functions are featured in each cluster. The sensing cluster, for instance, includes elephant nose fish, which use electric sensors in their skin to detect weak electrical pulses produced by prey, and blind cave fish, which navigate using special cells that detect water pressure changes. The defense cluster includes glass catfish, whose bodies contain mirror-like guanine crystals, causing predators to see mostly reflections instead of their prey. The feeding cluster includes leeches, which inject both an anesthetic and an anticoagulant to block the pain of their bite and keep the blood flowing when they latch onto their hosts. And the locomotion cluster includes a chambered nautilus, which squirts out a jet of water to propel itself through the sea.

The three islands in the center of the exhibit address survival tactics in extremes of water abundance and scarcity, stillness and movement, salinity and freshness, and heat and cold. In the first island, the water scarcity display is inhabited by bearded lizards and gila monsters, two experts at water conservation. Leafy and weedy seadragons drift gracefully at the other end of the island, both of which depend on large bodies of water for their survival. Between the two displays, an interactive touch surface enveloped in mist allows visitors to "wipe away" images to reveal information about organisms that have adapted to a wide range of available water conditions. The second island, which houses koi, cichlids, and jellyfish, turns the focus to water

movement and salinity. Here, two more touch-responsive surfaces address adaptations to various levels of salinity and motion, while water spurts and flows across them. The third island, which puts the spotlight on temperature, includes a display of yellow perch under ice. A final touch surface allows visitors to pull up images and stories about animals that survive in a wide range of temperatures.

Once an hour, the entire exhibit is transformed into a full-round theater, playing a five-minute video about the importance of water on the planet. A ring of ten high-resolution video projectors create a seamless, surround-view projection field along the top six feet of the Water Planet walls. The show, which is narrated by Julia Louis-Dreyfus, outlines the properties of water, its link to the origin of life on Earth, and the need to conserve this precious resource.

A Novel Design and New Technologies

The Water Planet exhibit was conceived by New York-based design firm Thinc, which set out to create a powerful and engaging public experience inside an exhibit that reflected the tactility and sensuality of water. To design the exhibit's innovative wall treatments and islands, they partnered with Urban A&O, an architecture firm that specializes in the design and precision modeling of sophisticated forms and surfaces using CATIA-based software. The molds for the exhibit's sculpted walls were carved on a computer-guided, five-axis milling machine. The wave-inspired panels were then formed in fiberglass.

The sinuous forms that invite touch throughout the exhibit become directly responsive in the interactive touch surfaces that are embedded in the three central islands. The imagery on these surfaces is projected from above, while water and mist play across them. Hand motion over the surfaces is tracked using camera vision, rewarding curious visitors with responsive content.

In order to project the surround-view media presentation onto the sculpted surfaces of the Water Planet walls, the designers turned to Seventh Sense software, which is capable of merging multiple sources of projection onto compound-shaped visual fields, creating a seamless, shared experience for up to 150 people.

The combined effect of these technologies is an immersive, interactive space that evokes a sense of wonder about the key element that makes life possible on Earth—water.

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