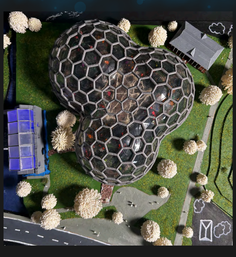
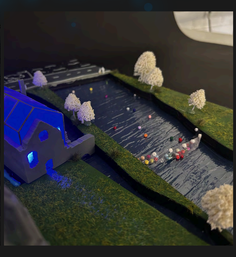
LuminNEXUS

This project proposes an immersive, adaptive environmental installation inspired by marine ecosystems, bioilluminescence, and responsive architecture. Designed as a potential experiential environment for The Eden Projects, the scheme combines interactive technology, living bioilluminescent algae, and cybernetic feedback systems to educate visitors about ocean conservation through experience transforming the visitor from a passive spectator into an active participant in environmental awareness

The environment reacts in real time to human movement using optical sensors, internal water systems, and glowing algae embedded within double-layered glass floors and canopy structures. As visitors move through the space, the architecture responds with changing light, atmosphere, and environmental effects, creating a direct relationship between people and the surrounding ecosystem.

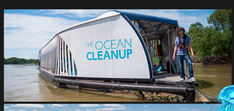
Inspired by immersive precedents such as Oriental Eden and digitally responsive environments like teamLab Borderless, the project explores how adaptive interior architecture can strengthen emotional engagement, environmental awareness, and long-term retention of conservation messages.

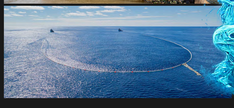




Microplastics
are now found in
100%
of marine environments

~8–12 Million Tonnes
of plastic enter the ocean each year

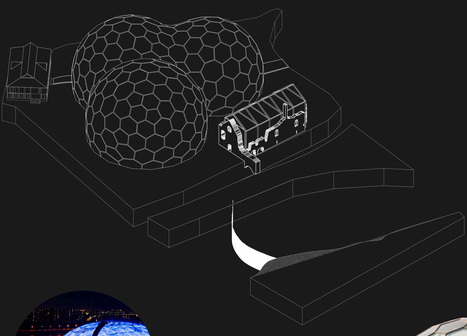




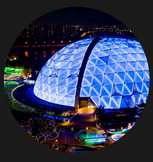
Over 700 Marine Species
ARE HARMED BY PLASTIC POLUTION

Positioned between the River Avon and Christchurch Harbour, Norman House becomes more than just a site for the project, it becomes part of the environmental story itself. The river running alongside the site acts as a direct reminder of how pollution and microplastics travel from inland environments into the ocean. Inspired by initiatives such as The Ocean Cleanup, the project explores the river as an intervention point where waste can be intercepted before reaching marine ecosystems, reinforcing the idea that local environmental action can contribute to global ocean conservation efforts.

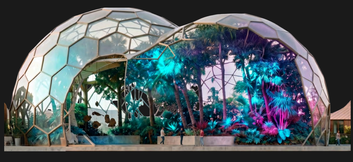
The historic stone structure provides a dramatic contrast to the living bioilluminescent systems introduced within it, allowing the project to merge past and future, nature and technology. As visitors move through the adaptive glowing environments, the building transforms into an immersive ecosystem that reacts to human presence and behaviour, encouraging stronger emotional connections between people, architecture, and the natural world.

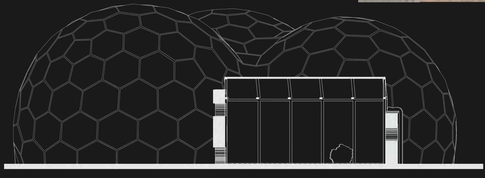


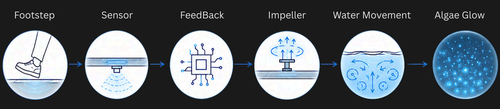
Inspired by the interconnected ecosystems of Avatar, the bioilluminescent flora symbolises collective action and the relationship between people and wider ecological systems. During the day, the space operates as an educational environment for workshops and environmental engagement, while at night it transforms into an atmospheric event space driven by responsive lighting and immersive experiences. The glowing interactive landscape reinforces the idea that small individual actions contribute to larger environmental change.

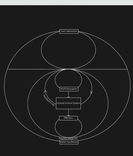


The proposed intervention aligns with the mission of The Eden Project by using immersive environmental storytelling to educate visitors about ocean conservation. Through interactive bioluminescent systems and sensory experiences, the project encourages visitors to engage with ecological issues in a memorable and participatory way.









Bioilluminescent algae is used within the project as a living feedback system that visibly responds to human interaction. When people move through the space, optical sensors hidden within the double-layered glass floor detect their presence and activate internal water movement systems. This disturbs the algae, causing it to glow.

The result is an environment that reacts in real time to the people inside it. Small movements create subtle pulses of light, while larger crowds generate more intense environmental changes. This helps users physically see how their actions affect the surrounding environment, transforming invisible ecological processes into immersive experiences. By turning environmental feedback into something interactive and visible, the project introduces cybernetic ideas of response and interaction in a simple, accessible way. The space effectively "communicates back" to its users, encouraging awareness of the relationship between human behaviour, technology, and natural systems.

This immersive approach also strengthens the retention of the ocean conservation message by creating an emotional connection to the marine ecosystems and bioluminescent organisms that inspire and bring the project to life, encouraging greater awareness of the need to protect ocean habitats and wildlife from pollution and environmental damage.