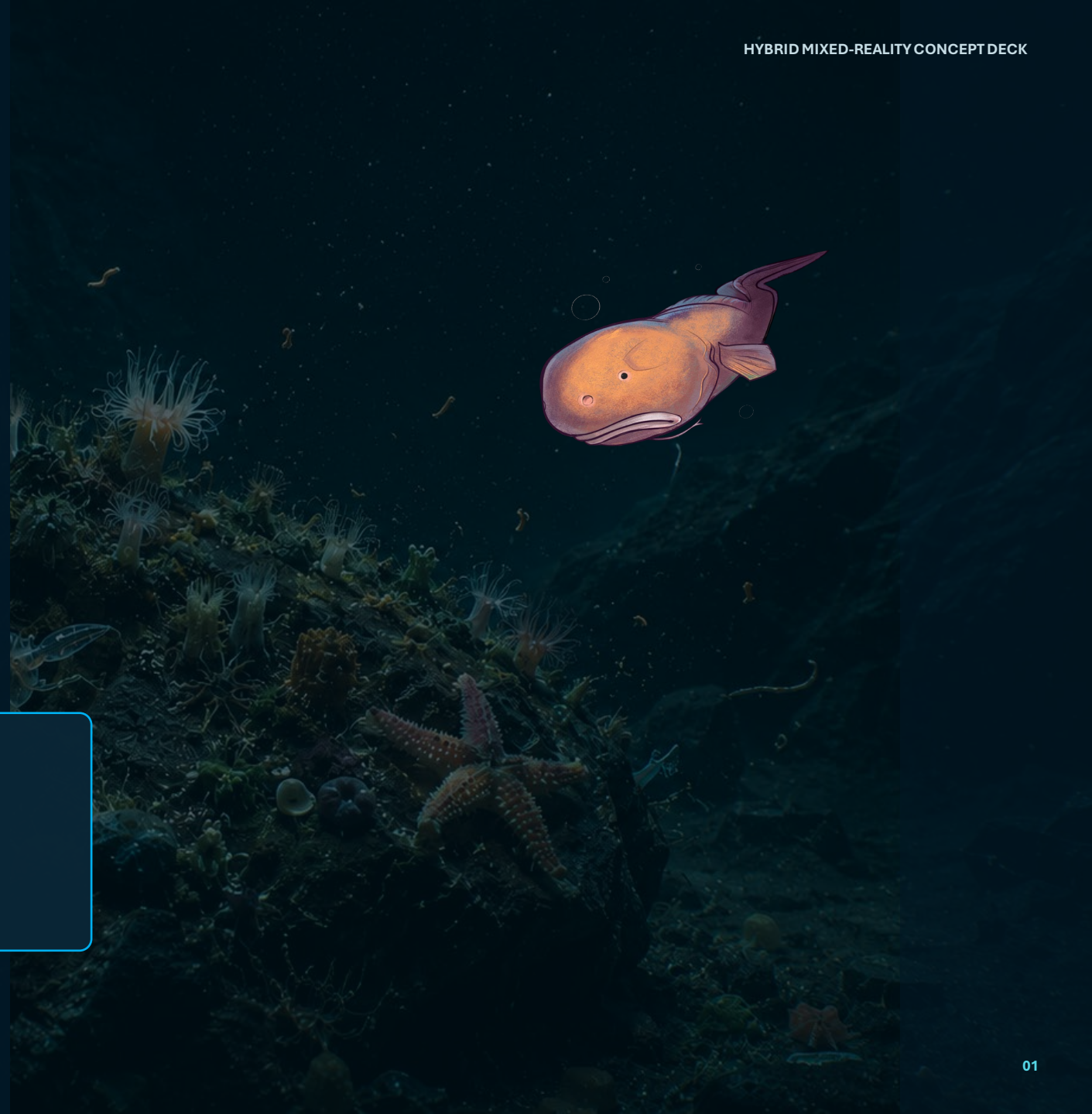
BEFORE WE KNEW YOUR NAME

MISSION: SCHOLL DEEP

A physically embodied mixed-reality expedition into the Kermadec Trench: Scholl Deep.



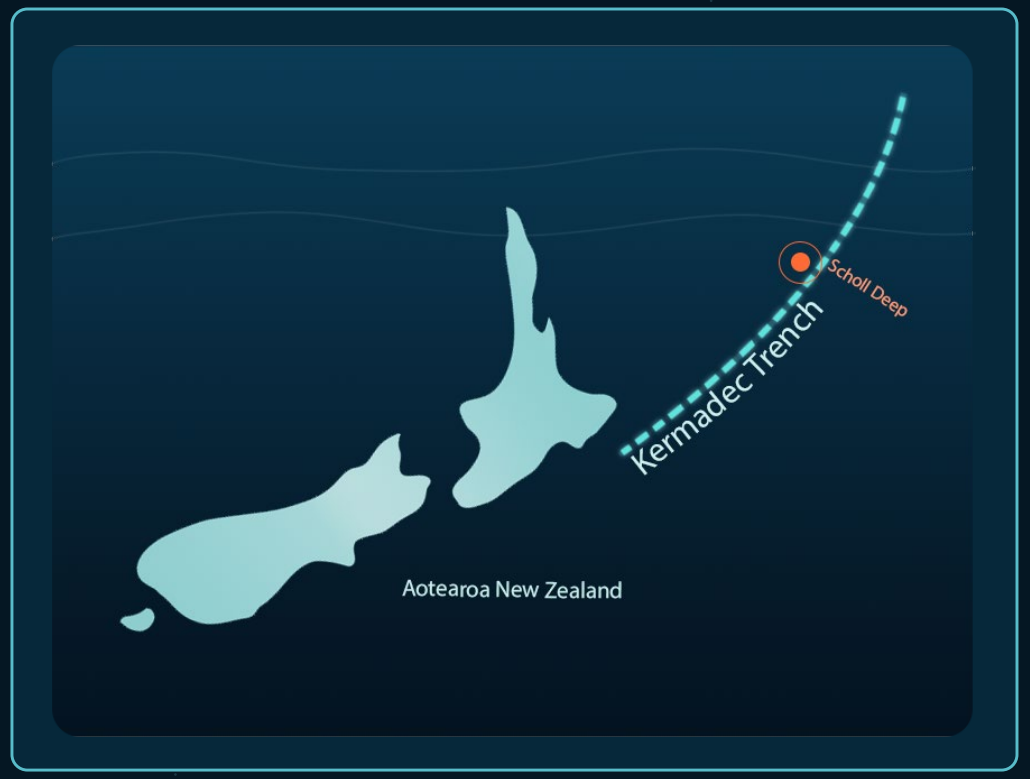
Enter a moving mixed-reality sub simulator traveling to Scholl Deep, uncover a living community on one solitary rock, and build a collective field record that turns discovery into responsibility and action.

University of Canterbury • Aotearoa New Zealand • Physical Sub + VP LED + Meta Quest 3

Nikki Dunsire, Ellie Adams, Pablo Taylor, Bree Cooke, Mark MacDougall

Why the Kermadec Trench

Globally significant science, connected directly to our location and responsibility as educators in Aotearoa New Zealand.



10,000+ m

Scholl Deep below sea level

1,000+ km

Trench length

2nd

Crewed visit to Scholl Deep in 2022

Emotional pressure point

Discovery and disturbance occupy the same place: rare life, sediment tracks, fishing gear, and synthetic particles all become part of the story.

Recent dives encountered animals presumed new to science - or not collected since the 1950s - and fishing floats and nets on the same seafloor.

This region is more than a backdrop. The future of the Kermadec/Rangitāhua area remains unsettled, making scientific evidence, genuine partnership, and shared public responsibility central to what happens next.

We are meeting life for the first time in places our impacts reached before we did.

Locally connected. Globally meaningful. A place where wonder and responsibility can occupy the same experience.

Sources reflected in proposal: NIWA/Te Tini a Tangaroa, MfE, Beehive, Te Mana o Rangitāhua.

A physical submersible. A shared LED world. A mixed-reality close encounter.

Each layer has a distinct job, so the experience feels embodied without becoming technologically bloated.

01	**Physical sub + motion**	Seated cabin, real surfaces, vibration, restrained robotic movement.
02	**VP LED + Unreal**	The macro environment: water column, Kermadec geology, Scholl Deep and the rock.
03	**Quest 3 MR**	Passthrough keeps the cabin visible while life, data and scale cues enter the room.
04	**PA + HMD audio**	PA carries shared narration; headsets add spatial, role-specific detail.
05	**Field record**	Evidence turns into a shared entry and one practical next step.

Design rule

The LED wall establishes the world everyone shares; the headsets reveal what each researcher notices within it.

Hybrid architecture from the proposal: physical embodiment, shared macro world, MR near-field life, dual-layer audio and field record.

A story told through the expedition

The conservation message emerges through wonder, evidence, insight, and care — rather than a lecture after the experience.



Prepare
Research roles, calibration, safety briefing

Descend
Geology, darkness, living signals

Find the rock
A barren seafloor becomes a neighbourhood

Build the portrait
Image, scale, behaviour, environment

Change scale
The rock becomes a city; the crew becomes guests

Recognize the trace
Food and synthetic material move through the same pathways

Return with agency
Shared field entry + practical next step

Pivotal scale moment

At human scale, the rock is an object. At organism scale, it becomes a city — and the participants become guests.

Emotional movement

Wonder → discovery → unease → responsibility → agency. The reveal is the pivot, not an ending.

The journey is guided and seated to preserve comfort while keeping the crew active as researchers, not captains piloting a VR sub.

The discovery belongs to the crew.

No one researcher has enough information alone. The field portrait becomes meaningful only when the crew combines evidence.

1 Imaging Researcher

Camera + documentation

Frames, stills, scale reference, visual detail

2 Ecological Observer

Light

Movement, habitat, feeding, response to disturbance

3 Environmental Researcher

Sensor + limited manipulator

Depth, current, pressure, acoustic and particulate readings

4 Field Recorder / Interpreter

Evidence synthesis

Observation vs inference, confidence, uncertainty, final entry

The emotional reward is the collective experience: “we noticed this together.” The evidence system advances through communication.

The headsets provide different responsibilities within the same shared reality, not four separate versions of the story.

One rock. One possible new lifeform.

The prototype is contained, but the encounter feels rich: a solitary rock becomes a living neighbourhood, and one organism invites careful study.



Contained setting

Inspired by the Kermadec solitary-rock observation: finite enough to build, dense enough to explore, and emotionally memorable.

Simulated candidate organism

Only the hero organism is speculative. It is marine-biologist-guided, plausible, and labelled as simulation.

Evidence, not certainty

The assessment shifts from
unidentified → unusual → candidate for further study.

There is not a declaration that “you discovered a new species.”

UNIDENTIFIED → UNUSUAL → CANDIDATE

Scientific transparency: simulated organism; real methods, uncertainty, ethics and conservation context.

The rock becomes a city.

The mixed-reality layer shifts the crew from observers outside the ecosystem to guests moving through its scale, currents and relationships.

Scientists documented a solitary rock supporting sea stars, anemones, small corals, sponges and a sea squirt at 6,124 m.

At organism scale, feeding currents, shelter spaces, synthetic fibres and living relationships become visible without turning harm into spectacle.

Core message: Finding human material in the trench tells us where it has travelled. Understanding possible effects tells us why that journey matters.



Observed

a fibre, current, response, light/proximity record

Documented

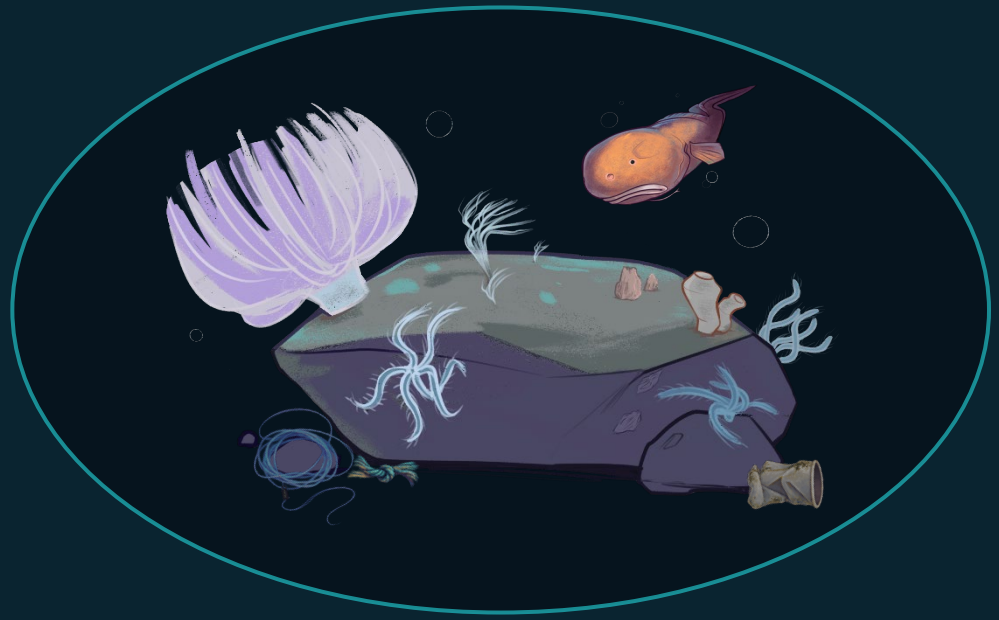
deep-sea particles, debris impacts, lab evidence elsewhere

Uncertain

cause, ingestion, long-term effects, combined stressors

Observation becomes contribution.

The living field record is a structured, crew-built evidence record — not a passive log and not a quiz.



14-meter wide curved LED wall with a super fine 1.9mm pixel pitch with four supporting modular wild walls and an overhead projection scrim for ambient lighting to achieve a 270-degree spatial wrap

LED WALL / SUBMERSIBLE VIEWPORT

1	**Auto-captured evidence**	images, scale references, readings, tool use, light exposure, proximity
2	**Role-specific prompts**	predefined evidence tags, multiple-choice observations, confidence ratings
3	**Collective synthesis**	unidentified, unusual, or candidate for further study
4	**Verified action path**	the crew chooses one practical next step to carry forward

Four interpretation layers

What we observed → what research documents → what remains uncertain → what we can do.

Discovery is not possession, rather it is the beginning of care — and care becomes meaningful through action.

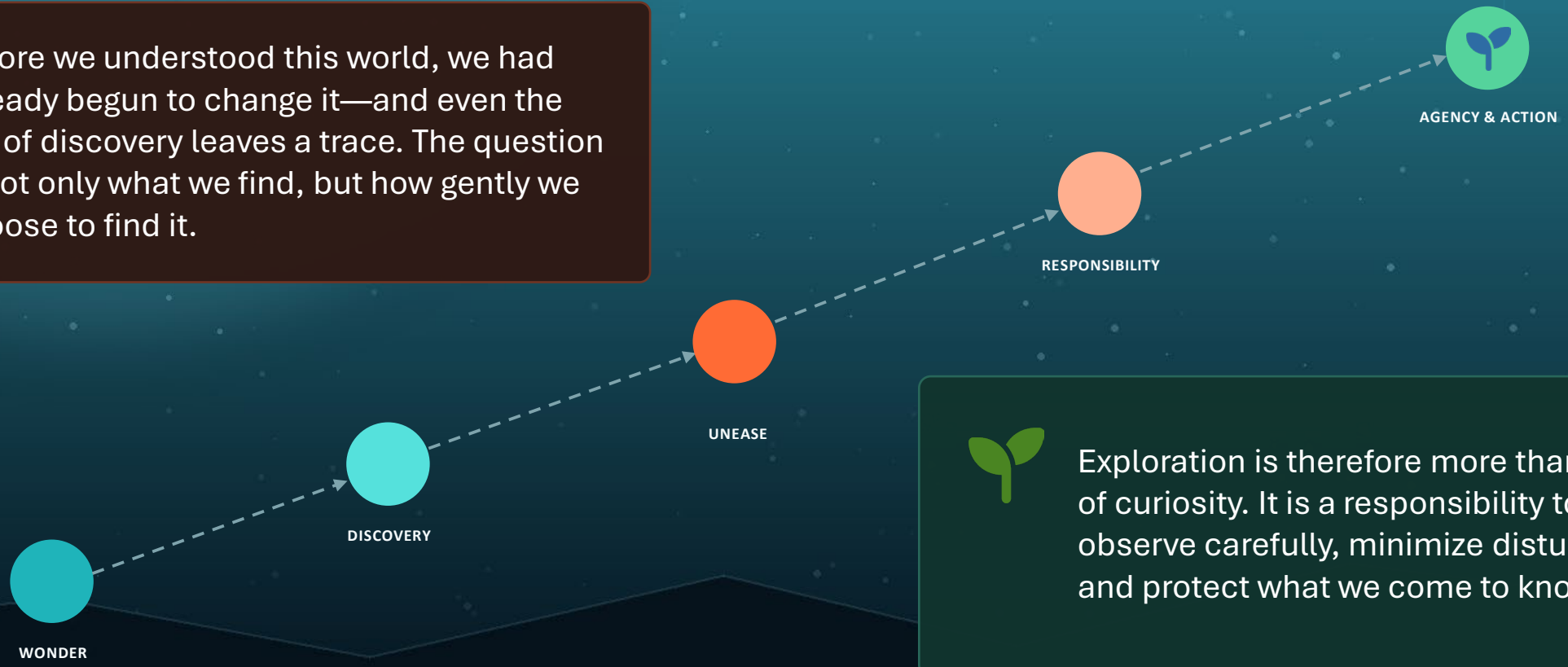
The final entry belongs to the crew, while still recording each researcher's contribution.

The emotional architecture.

The first prototype should include only the essential elements needed to demonstrate the shared expedition, discovery process, emotional journey, and path to action.

The human impact should be the turning point.

Before we understood this world, we had already begun to change it—and even the act of discovery leaves a trace. The question is not only what we find, but how gently we choose to find it.



Exploration is therefore more than an act of curiosity. It is a responsibility to observe carefully, minimize disturbance, and protect what we come to know.

A difficult truth becomes meaningful only when the participant can carry a credible next step back to the surface.

A clean fit across all six criteria

One emotionally legible idea, one achievable prototype boundary, and a credible path to broader educational impact.

SCIENTIFIC INTEGRITY
Documented Kermadec context, real methods, labelled simulation.

AUDIENCE INSIGHT
Participants look, interpret, document, decide and contribute.

ORIGINALITY
Physical sub prototype + VP + co-located MR, not a collection game.

FEASIBILITY
One site, one organism, one scale shift, one record.

EMOTIONAL IMPACT
Wonder becomes connection; unease becomes agency.

POTENTIAL TO SCALE
UC installation → static MR/VR → museum / classroom /OceanX.

One expedition. One rock. One possible new lifeform. One shared record.

We came to the deep ocean looking for what had never been seen. We returned knowing that seeing is only the beginning.



Thank you.

Cultural interpretation would require appropriate partnership and co-design; policy and permitting status should be rechecked before public release.