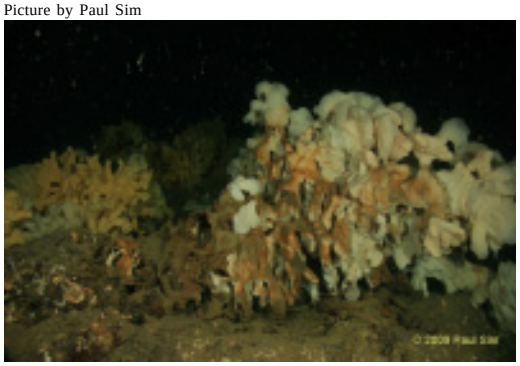
The Deep Bioherms of Howe Sound

By Glen Dennison

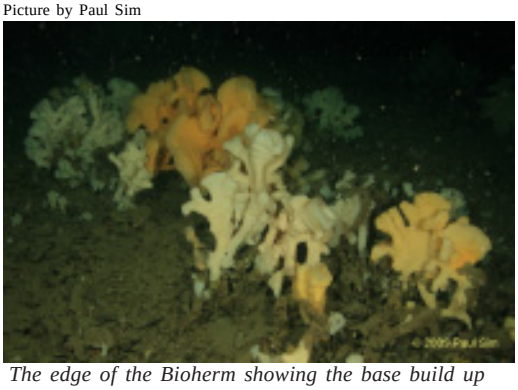
Falling… dropping, ever deeper through utter inky blackness, faster and faster, nothing to see or touch, even gravity seems missing. Drifting through the aqueous void you are truly in an aquatic alien world never meant for humans. Pressure and the sound of compressed air blowing into your drysuit are the main feelings you have as you plummet into the depths… in search of the giant bioherms of Howe Sound. The intense cold is held at bay by the barrier of a Quadflex nylon suit and a layer of snuggy warm liners. This is the far technical end of air diving; the deepest you can safely go with out trimix gases and in the most exposed location of the Sound. Beyond these depths it is the realm of exotic mixed gas diving or mini subs for humans. Carefully watching the luminescent faces of our dive computers we see 100 feet go by and still no bottom. There is no references anywhere you look; the darkness is ubiquitous and absolute, and only the power of the high intensity dive lights guide our every downwards path. You feel like Alice, falling towards Wonderland. High descent speed is needed as the currents can push you off the narrow underwater peaks into the deadly abyss, and it's straight down off the back of dive vessel into wide open water. Plunging deeper past 100 feet vague images start to appear in the form of light snow white patches, focusing now my vision stops shimmering, and as far as the eye can see the valleys and rises are outlined in grayish green white. The reef is near and just below us at 125 feet down. 12 stories beneath the ocean surface we stop above a kaleidoscope of glowing multi coloured giant sponge with total coverage on the ocean floor. Glass sponge everywhere with not one square foot of bottom area that can be touched with out contacting sponge — buoyancy control is an absolute necessity on the dive. Some of the sponge maybe decades old and extremely fragile; they can not be touched or handled. These are the cold water reef builders, our closest analogue to the tropical water corals. Due to air conservation all our movements are slow at this depth as each breath we take is the equivalent volume to about four lung fills on the surface. Hovering we gently swim over the sponge some standing 2 meters high. Light colours of yellow, orange and clean white flash back to us when our dive light beams caress the sponge. Stems growing from stems, lobes stick out here and there, random forms that look more like clouds or something from a Dr. Seuss's book; this is the sponge of the Howe Sound deep bioherms. As we swim deeper into the bioherm the density and size increase, white mitten pads of sponge are everywhere, a forest maze of crazy shapes; one wonders if the slight disorientation caused by the nitrogen in the air supply is producing hallucinations. Then we spot a huge long funnel shape with bumps on the sides, a different type of sponge, a vase sponge, natures own ancient sculptured artwork. Out of one of the funnels a bright orange lobster shrimp peeks looking back in curiosity at us, for we are the first divers it's ever seen as this bioherm has lain undiscovered for thousands of years. The rock of the deep reef structure never full sounded by the government survey vessels and missing from the Canadian Hydrographics Howe Sound 3526 chart; a lost land of deadly enchantment, deep below the surface and in view of all Lions Bay but for an emerald blanket of ocean concealing it.

Picture by Paul Sim



Entering the Bioherm

Picture by Paul Sim



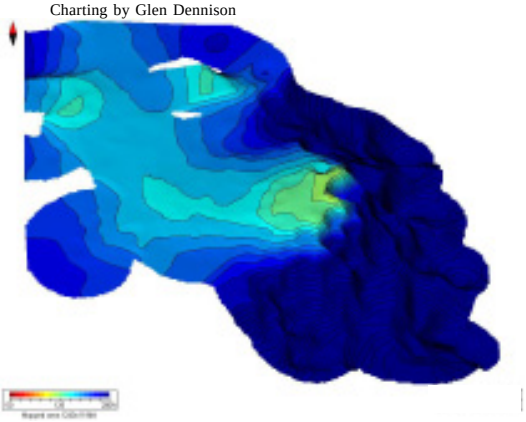
The edge of the Bioherm showing the base build up

Picture by Paul Sim

Deep into the Bioherm

The sponges are beautiful beyond words, fragile as fine crystal, yet as large as a small car. They are the Howe Sound glass sponges reefs, living in colonies known as sponge bioherms. Existing in an almost sunless world of intense pressure and cold, the sponge, live, die, and build upon themselves forming reefs that rise up off the bottom to depth that are just reachable with scuba gear. As the sponge dies new sponge replaces it attaching to the dead skeletons of the old sponge. Looking at the base of the bioherm you can see the compressed dead sponges ramping up forming the pedestal of the reef. This dark grey foundation rubble is silica and is similar to greasy mud, soft and oozy; a diver can insert an arm deep into the bioherm bottom substrate with out much effort. Dissolved silica is the building material of the sponge; they filter the silica out of the water to fabricate their sculpted shapes. Water is pulled in on the sides and expelled out through the funnels or paddle openings. The colonies live in near darkness and thrive in total blackness. Only in certain areas of the world can these sponges exist. In Howe Sound the most abundant type of sponge is the cloud sponge with the mitten shapes known as *Aprhocallistes vastus*, this sponge lives in both sponge gardens and in bioherms. The sponge gardens are found on deep rocky peaks, where as the bioherm are in flatter gravel beds and tend to be at greater depths.

Charting by Glen Dennison



Bathymetric chart of the lost reef

Several weeks previous I had been meeting with Dr. Jeff Marliave, senior marine researcher from the Vancouver Public Aquarium, when he handed me his latest publication paper about sponges. Studying it I informed him that we had located, and been diving several sponge beds for years. He was very interested and excited. Immediately I offered to take him out and we had the beginnings of a fully out expedition to the bioherms.

Weeks later, Jeff, loaded the aquarium dive boat with survey divers and our two boats rendezvoused on the site. Months earlier I had mapped the area with a specialized 3-D computerized charting system we use for diving and we positioned ourselves over the peaks and dropped our pathfinder divers, next our film crew with high definition video cameras, followed then by the VPA survey divers. Jeff, grounded by a head cold stayed top side with the boats and deck crew.

Picture by Paul Sim

Sponge on top of sponge

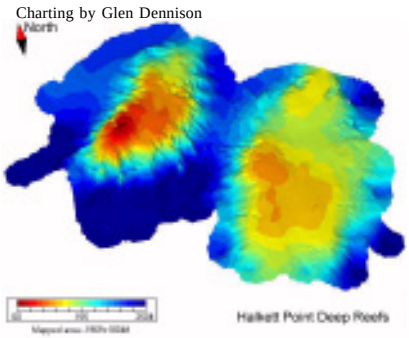
After the dive and at lunch, Dr. Marliave studying the information announced we had found a sponge previously unseen in the Sound… all to the amazement of the dive team. What we had stumbled on with out realizing it at first was the first discovery of the vase sponge, (aka, finger goblet or yellow goiter sponge), *Heterochone calyx*, in Howe Sound.

Jeff, smiling and happy, announced he now had to do a re-write on his paper to include the newly discovered sponge and bio-herm.

It was just another good day of diving in the Sound.

Sponge Facts

Built from Silica extracted from the sea water.
Growth rate 2 to 10 cm per year.
Colours white, orange yellow and in hues between.
Number of known sites in the Howe Sound; 4, with several locations currently under exploration.
Depth 85 to over 300 feet. (Scuba exploration ends at 150 feet in most cases.)
The first discovery of living sponge bioherms was in BC waters (mid 80's) and previously only known from fossil records.
Several bioherm in BC waters have been studied that are 18 meters in height and over 700 square kilometers in size.



Bathymetric chart of the Halkett Pt. Reefs