

LIFE ON THE EDGE - IN CAYUCOS AND ROCKY SHORES ALONG THE WEST COAST, SCIENTISTS ARE SAMPLING THE EVER-CHANGING TIDEPOL POPULATIONS

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'THERE ARE GOOD THINGS TO SEE in the tide pools and there are exciting and interesting thoughts to be generated from the seeing. Every new eye ... may fish in some new beauty and some new pattern and the world of the human mind must be enriched by such fishing.' -- JOHN STEINBECK

Anyone who has ever gazed into a tide pool at Montana de Oro State Park has marveled at the variety and abundance of life clinging to a pinnacle in the surf.

A group of university and government biologists has taken this love of tide pools and the coastline one step further.

They have combined it with the discipline of science to build a detailed picture of rocky intertidal areas from Washington to San Diego.

Called the Shoreline Inventory Project, the study literally puts under a microscope that narrow band of the coastline which is alternately wet and dry according to the ebb and flow of the tides.

Sandy beaches are not included in the study. Instead, it concentrates on 75 sites where the sea washes over rocky benches and outcroppings to form tide pools.

Intertidal areas at Piedras Blancas, Cambria, Cayucos, Montana de Oro, and Shell Beach are included.

The study has revealed both expected and unexpected finds. Here are several highlights:

- * The health of intertidal areas varies widely from place to place according to how much pollution and human use to which each is exposed.

"In the San Luis Obispo area, the intertidal is very healthy," according to Peter Raimondi, a UC Santa Cruz biology professor, who is one of the study's principal investigators. "Trampling and collecting are big problems in Southern California."

- * Scientists were surprised to learn how much tide pools change over time according to seasons, El Nino weather cycles and other natural forces.

Some sites have experienced wholesale shifts in the species of algae and animals that inhabit them during the decade-long life of the study.

"They are not as stable as they might seem," Wilson said "That's one of the cool things to come out of this study."

Teeming world along coast

On a recent afternoon, a group of researchers participating in the study examined a rocky ledge just offshore of the State Parks department's Estero Bluffs property north of Cayucos. Low tide had exposed the normally submerged ledge.

The receded waters had uncovered a teeming world of scuttling hermit crabs, giant green anemones, orange and purple sea stars, waving surf grass, abalone hidden in crevices, and boulders festooned with limpets and barnacles.

"The intent of the study is to get baseline information in an effort to assess the health of the intertidal zone," said Raimondi. "We also want the data to be collected in a uniform, scientific way."

The study has been an effective tool for tracking the progression of withering syndrome, a disease that has nearly wiped out abalone populations in Southern California.

Withering syndrome impairs an abalone's ability to digest food and its soft tissue within the shell gradually withers away.

The disease started in the Channel Islands and has progressed as far north as Cayucos.

This progression was dramatically confirmed during the most recent sampling session.

Only two black abalone were found at the Cayucos site. Melissa Wilson, also a UC Santa Cruz research technician, pried one of the mollusks off the rocks and held it up.

Normally, an abalone's body spills over the edge of its shell, she explained. This abalone's body, however, was already beginning to shrink within its shell.

Later in the day, the sampling team surveyed for abalone on an isolated stretch of coastline in Cambria, outside the range of the disease. They found 14 healthy abalone in one large crevice.

Quest for knowledge

The program started in 1991 and is primarily funded by the Minerals Management Service, the federal agency that regulates offshore oil development. The first study sites were areas where oil rigs are located.

Biologists with the agency wanted to have an accurate picture of what a healthy intertidal area looks like in case an accident at one of the state's oil platforms polluted a section of the coastline, said Maurice Hill, a Minerals Management Service biologist out of

Camarillo.

That kind of information would be priceless to post-spill cleanup efforts.

"It's kind of a good-neighbor policy," Hill said of the study. "There's just so much we don't know about the intertidal zone."

Hill was one of the scientists sampling the Estero Bluffs site. He and the others set to work photographing the area, measuring surf grass beds, taking inventory of barnacles and other crustaceans in plots called quadrats, and counting sea stars, abalone and owl limpets.

Each site is sampled twice a year, once in the fall and again in the spring.

During each sampling session, the scientists take a big-picture look -- noting what sea birds and marine mammals are present -- as well as closer looks that get so detailed they use microscopes to examine barnacle growth rates and calipers to measure the size of black turban snails.

"I like the idea of studying a whole system," said Tish Conway-Cranos, a UC Santa Cruz technician who samples the Central Coast sites. "It's just the most interesting place to learn."

This ability to examine a single ecosystem in depth over an extended period of time makes the Shoreline Inventory Project unique, said Christy Roe, another Santa Cruz technician.

Since its inception, the study has expanded up the coast through Oregon.

The researchers hope to keep the study going indefinitely, as long as their funding holds out. The most recent Minerals Management Service contribution to the study was \$500,000 over three years.

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