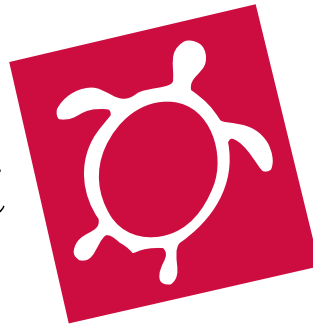


Environment



Hawai'i

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Walking on Water

Climate change portends huge disruptions to coastal states such as Hawai'i. That beach walk? In 40 years, you'll need your Wellies to stroll the same ground. By the end of the century, your great-grandkids will be donning hip waders.

That may well be the best-case scenario. Under some forecasts, which predict massive melting of the Antarctic and Greenland ice sheets, anyone wanting to trace those same paths will need scuba gear.

And yet — state and county agencies responsible for defending vital infrastructure have not yet undertaken the work that will be needed to prepare against the day when coastal flooding overwhelms roads, harbors, sewage treatment facilities, and power plants. Legislators have not started budgeting for the massive capital outlays that will be required.

Hawai'i is fortunate to have moved past debate over *whether* climate change is real and to have begun laying the legal groundwork for moving forward. But it is not too early to start the hard work of preparing for its inevitable consequences. The sooner the better.

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Mahalo!



PHOTO: NATIONAL PARK SERVICE

A fish pond in Kaloko-Honokohau National Park.

National Park Service Seeks State Control Over Aquifer System at Kaloko-Honokohau

A petition by the National Park Service (NPS) seeking state control over withdrawals from the Keauhou aquifer system could slow the pace of development in North Kona at the same time Hawai'i County is trying to encourage growth there.

The NPS has long worried that increased pumping of the aquifer will diminish the flow of cool, fresh sub-surface water to the ancient Hawaiian fishponds and anchialine pools

along the coast of Kaloko-Honokohau National Historic Park. And after years of submitting testimonies on development plans, making presentations to commissions and boards, and participating in roundtable discussions with little effect, the NPS, on September 13, formally asked the Commission on Water Resource Management to designate the Keauhou aquifer system, which

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Moving Beyond Climate Change Plans To Action Challenges State, Counties

In Anahola, Kaua'i, the county has been struggling to keep 'Aliomanu Road passable for the better part of two decades. It has spent millions defending the road, now reduced to one lane, from scouring waves. In years to come, it will face spending millions more to keep open the only vehicular route to a small neighborhood of large homes and

vacation rentals. Might it be cheaper to open up an alternative route to the enclave?

At the other end of the island chain, in the Puna district of the Big Island, the homeowners' association of Kapoho Vacationland is facing the daunting challenge of what to do about Wai'opae Road.

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Environment



Hawai'i

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NEW AND NOTEWORTHY

Kaua'i Springs to Get High Court Hearing:

The Hawai'i Supreme Court will hear the appeal of a Kaua'i water bottler from an Intermediate Court of Appeals decision last spring.

The lower court had ruled on April 30 that the Kaua'i County Planning Commission was within its rights when the commission found in 2006 that the operations of Kaua'i Springs in the state Agriculture District violated zoning laws.

The 5th Circuit Court found in favor of the bottling operation, owned by James Satterfield and family members. The ICA reversed that ruling and remanded the matter to the Planning Commission.

In late July, Kaua'i Springs appealed to the state Supreme Court, which on September 4, agreed to hear the case. Arguments before the

high court are scheduled for November 21 at 11:15 a.m.

For more background to this case, see the cover article in the June 2013 edition of *Environment Hawai'i*.



A Setback on Setback Dispute: Hawai'i island developer Scott Watson, whose several projects along the Hamakua Coast have been the subject of articles in *Environment Hawai'i* over the last year, sued the county planning director and Planning Commission in May, challenging the setback that was imposed on a lot in Pepe'ekeo where he is building a large house.

The Special Management Area permit governing the subdivision that includes his lot established a building setback of 40 feet from the top of the sea cliff, or pali, that runs along the seaward edge of the subdivision. Steve Strauss, the lawyer for Watson and his co-owner, Hilo Project LLC, argued that state law forbade the counties from establish-

ing setbacks greater than the 40-foot distance called out in the state's Coastal Zone Management Act (Chapter 205A of Hawai'i Revised Statutes).

In August, Judge Glenn S. Hara of the 3rd Circuit Court rejected Strauss' argument. "At the hearing on July 19, 2013," Hara found, "both parties acknowledged that the SMA permit conditions became restrictive covenants burdening the subject property" at the time the permit was issued, in 2004.

"The approval letter [covering the permit] clearly states that if the conditions contained in the permit are not complied with, the permit may be revoked, and that successors and assigns of the subject property, including Plaintiffs, are bound by those conditions." Hara wrote.

As to the argument that the setback of 40 feet from the top of the cliff imposed by the county violates the CZM Act, Hara wasn't buying any of it: "It is apparent from a reading of the applicable statutes that a setback of greater than 40 feet from the 'shoreline' could be set during the subdivision application approval process. For example, HRS §205A-45(a) expressly grants counties the authority to alter the setback distance, stating that, '[t]he several counties through rules adopted pursuant to Chapter 91 or ordinance may require that shoreline setback lines be established at distances greater than that established in this part' (emphasis added)."

Additional background to this case appears in an article published in the June 2013 issue of *Environment Hawai'i*.

In a separate but related development, Strauss executed an agreement with the Planning Department to resolve other problems that the department had noted in relation to work at the Pepe'ekeo site. Those included the construction of a swimming pool where plans had called for a tennis court, failure to install a silt fence at the construction site, and not having a final approved historic sites plan. Without admitting culpability, Watson paid a \$500 fine to resolve all the disputes.

For more on problems at the site, see the articles in the December 2012 *Environment Hawai'i*.

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Quote of the Month

"Every single state department and county department needs to figure out how sea level rise and other factors impact our mission."

— **Chip Fletcher, associate dean,
UH School of Ocean Science
and Earth Technology**

In Hawai'i, a Long History of Plans For a Changing Climate, Few Actions

If planning were all it took to solve the problems of global warming, the state would be sitting pretty. The call for plans to address climate change goes back more than 40 years. In 1972, the federal Coastal Zone Management Act included the statement that "global warming may result in substantial sea level rise with serious adverse effects in the coastal zone" and called on coastal states "to anticipate and plan for such an occurrence." States participating in the CZM program — including Hawai'i — are to protect natural resources and manage coastal development "to minimize the loss of life and property caused by improper development in hazardous areas as well as those areas likely to be affected by sea level rise and other impacts of climate change."

Over the last decade, the focus of climate change planning in Hawai'i has shifted. A study prepared by the Department of Business, Economic Development and Tourism in 1998, titled "Hawai'i Climate Change Action Plan," dealt mostly with ways Hawai'i could and should reduce its greenhouse gas emissions. Nearly a decade later, Act 234 of the 2007 Legislature called for reductions in greenhouse-gas emissions and established a task force to report back on how specific goals to do so could be met.

Two years later, the Legislature overrode Gov. Linda Lingle's veto of a bill to establish a climate change task force. "The problem was it was never funded by the administration at the time," says Jesse Souki, director of the state Office of Planning. "It just ceased to

exist." Still, growing out of that impetus was a partnership between the state's working group on revising the Ocean Resources Management Plan and the University of Hawai'i's Center for Island Climate Adaptation and Policy. That led to the preparation and publication of a November 2009 report, "A Framework for Climate Adaptation in Hawai'i," which underpins much of the updated Ocean Resources Management Plan.

In 2010, the Legislature again paid its respects to the threat of climate change in passing Act 73, relating to food security. "Now is the time for bold action to squarely address Hawai'i's energy and food requirements and plan for and address the inevitable effects of climate change," the law states in its "Findings" section.

Last year, the Legislature amended the law setting out planning guidelines for the state, Chapter 225. The amendment makes adapting to climate change one of the top priorities that is to guide state and county governments as they develop plans and allocate resources. "The priority guidelines will serve as a guiding policy for adapting to the expected impacts of climate change through the existing implementation provisions of the Hawai'i State Planning Act, which include guiding all major state and county activities, programs, budgetary, land use, and other decision making processes, and county general plans and development plans," the act states.

Meanwhile, in the SMA

The state Coastal Zone Management Act as well as Article VIII of the state Constitution give to the counties the right to regulate development in the Special Management Area, a narrow belt that runs inland from the shoreline to, generally, the nearest major road.

Both Maui and Kaua'i counties have in recent years built into their SMA regulatory systems an approach that considers coastal erosion. In Kaua'i,

setbacks for building in the SMA are determined using an annual average shoreline erosion rate multiplied by 70 years, plus a 40-foot buffer on top of that. For buildings greater than 5,000 square feet, the multiplier is 100 years, since larger buildings will generally have a longer useful life, the county reasoned.

In Maui, setbacks are calculated by multiplying the average annual erosion rate by 50 and adding a buffer of 25 feet.

Neither O'ahu nor Hawai'i county has adopted a similar approach. Hawai'i County has a standard minimum setback of 40 feet. O'ahu setbacks are generally 40 feet, although for smaller lots they can be as little as 25 feet. New subdivisions on O'ahu are required to impose setbacks of 60 feet, however.

Although erosion-based setbacks are an improvement over fixed ones, they, too, have their limits. As Souki says, "they don't take into account sea level rise" and are based instead only on historical records. Michael Dahilig, director of the Kaua'i County Planning Department, acknowledges that limitation. "A lot of information is coming in now about melting glaciers and ice fields," he said — information that is not apparent in historical data.

Seven Steps

Souki told *Environment Hawai'i* that the Abercrombie administration is not planning to introduce legislation next year to address climate change. "There's no need," he said. "We haven't done all we can do with what we already have."

But the Hawai'i Coastal Geology Group, a part of the School of Ocean and Earth Science and Technology at the University of Hawai'i, has laid out a seven-step plan for action that will require a regulatory framework much more ambitious than what is now on the books.

Step 1 involves acknowledging sea level rise (SLR). "This can be achieved by writing SLR into our laws, public awareness efforts, and planning activities," the group says on its web page describing the impacts of sea level rise in Hawai'i. Notwithstanding the changes to the state planning act approved last year, "currently, you are not required to consider the future threat of SLR in where or how you build (or redevelop existing structures)."

The second step is to require potentially vulnerable structures to incorporate elements to mitigate the negative impacts of SLR. "By shifting the planning process to a risk-based footing, guidelines could be implemented to improve the safety of your house and reduce negative impacts on the environment," the recommendations state. "Planning is already



An eroding beach in Kihei, Maui

on a risk-based footing with regard to tsunami and storm surge inundation, and there is a growing effort to plan for the risk of coastal erosion. But there are no planning requirements in Hawai'i with regard to SLR." The 2012 amendments to the State Planning Act fall short of requiring action. Rather, they merely "encourage planning and management of the natural and built environments that effectively integrate climate change policy" and call on agencies to "promote sector resilience in areas such as water, roads, airports, and public health, by encouraging the identification of climate change threats, assessment of potential consequences, and evaluation of adaptation options."

Chip Fletcher, head of the Coastal Geology Group and associate dean of the School of Ocean and Earth Science and Technology, said in a phone interview that to date, incorporation of climate change in planning documents has not occurred on any meaningful scale. "So far, we haven't really seen any actual engineering or construction projects," he said. "As far as I know, no activities that are going for permits have been required to go back and address adaptation issues."

Step 3 is a requirement that all development plans include an assessment of risks associated with sea level rise—something, the recommendations say, that "will not be particularly challenging," given all the tools that already exist to accomplish this.

The next step involves redefining the special management area in light of SLR impacts. "Given the rising water table and drainage

problems related to sea level rise," the group says, "a simple distance from the shoreline is no longer adequate" to define the zone.

Step 5 is to designate "no-build" and "no-rebuild" zones, which "would move the coastal community toward improved resiliency (the ability to quickly recover from catastrophic events)." The group acknowledges that step involves formidable challenges—including the likely charge of unconstitutional taking by affected landowners. "The most straightforward approach is to purchase the land, or purchase restrictions on how the land is developed," the recommendations state. "That is, pay the landowner to not develop." In this connection, the group notes that the university's Sea Grant program has already published a study, "Climate Change and Regulatory Takings in Coastal Hawai'i," that looks at this very problem. (The study, written by Douglas Codiga, Dennis Hwang, and Chris Delaunay, is available online.)

Fletcher, who was the author of the recommendations, said that in considering areas for purchase, "you have to apply a triage approach. Places that are already locked up in seawalls or which are extremely expensive—don't bother with them. I would look at healthy beaches with a healthy sediment budget that are not otherwise impacted. Maybe where there are homeowners who have no heirs. You could help them by buying a conservation easement and then they leave their property to the state. Also, a number of coastal homes are not owner-occupied or

may be used as illegal vacation rentals. We could contact these owners and work out a deal—let them continue to operate on the condition they sell it to us at less than market value, for instance."

In that same vein, the group proposes new permitting tools in Step 6. One of the most innovative allows development to occur so long as the owner exercises a deed covenant restricting or forbidding the construction of seawalls to protect it in the event of sea level rise and also preventing redevelopment or rebuilding of damaged structures.

The last step—Step 7—involves "climate-proofing" communities. "Allowing the continued development of accreted lands, such as still occurs on some of the last healthy beaches in Hawai'i, makes no sense. In an era of accelerated sea level rise, this has got to end," the recommendations state.

Climate proofing involves some simple actions—such as raising the elevation of roadbeds when they are due for routine maintenance; adding one-way valves to culverts (such as those installed at Mapunapuna) to protect developed lands and valuable coastal wetlands; re-engineering ports, and anticipating and addressing impacts on infrastructure. A planning standard should be adopted to set targets for construction. As an example, the recommendations refer to a table of best- and worse-case scenarios for sea level rise that anticipates a worst-case rise of three feet by as early 2070 (with 2090 being the latest year in which a rise of that level would be seen). —P.T.

Climate Change continued from page 1

Ever since 1986, when Hurricane Estelle generated 22-foot-high surf along the shoreline, the pavement has resembled a minefield more than a subdivision street. Water washes over it at low tide from the ubiquitous natural ponds on lots mauka of the road. At high tide, the potholes fill up from the makai flows, making the worst hazards invisible to unsuspecting motorists drawn to the area to snorkel in the tidepools. Four years ago, the homeowners' association approved spending up to a quarter of a million dollars to repair the road but no work has begun yet.

On O'ahu, the industrial area of Mapunapuna, a former marsh that lies below sea level, floods whenever tides are high or rainfall is heavy. Two years ago, the City and County of Honolulu tried to fix the problem, spending nearly \$1 million to install one-way valves in drainage systems. By December

2011, however, the floods were back (a faulty valve was blamed). Although the valves may stop seawater from entering the area today, they can do nothing to address inundation by brackish water from a rising water table in years to come.

The beaches of Ka'anapali draw hundreds of thousands of visitors a year to West Maui, but in the fall of 2003, management at the Maui Marriott hotel and the Ka'anapali Ali'i condos saw erosion on a scale that toppled trees and threatened walkways and a pool. The eroding face of the shoreline cliff was buttressed with 40,000 or more sandbags, and when those failed to halt the encroaching sea, the hotel brought in steel plates and Triton barriers. This year, the Ka'anapali Operations Association, made up of hotel and condo owners, sought to have the state match its own payment of up to \$400,000 to pay for an environmental impact study in anticipation of a beach restoration project. Despite strong support

from the Maui delegation, the Legislature did not approve the bill.

It is possible that climate change has nothing to do with any of these events. Even so, the challenges they pose are the very sort that will become more frequent and daunting in the not-too-distant future. Whether, how well, and how efficiently the state and county governments cope with these changes down the road will be determined, in large measure, by how they prepare for them today.

And if the measures taken at Anahola, Mapunapuna, Ka'anapali and Kapoho are any guide, the outlook is not great.

Plans and More Plans

One thing Hawai'i does have going for it, says Jesse Souki, director of the state Office of Planning, is the fact that no one in any meaningful position of responsibility is disputing that climate change is real. "One positive thing in Hawai'i that's not often recognized," he said in a phone interview,

“is that we’re one of the few states where the conversation isn’t about whether it’s happening, it’s all about what we will do about it.”

In Virginia, for example, the 2012 legislature refused to include the phrases “climate change” and “sea level rise” in a bill for a \$50,000 study of climate change impacts on the state’s shorelines. As one legislator put it, those were “liberal code words.” Instead, legislators chose to describe the study as one investigating “recurrent flooding” and “coastal resiliency.”

With the blessing of Gov. Neil Abercrombie, Souki said, shortly after he was appointed to head the Office of Planning, “we began working on a climate change adaptation policy. I saw we had a policy dealing with greenhouse gases, but to be frank, if we produce zero greenhouse gases today, we’d still suffer for decades given what science is telling us – with sea level rise, a warming climate, the impact on agriculture and coastal structures,” and the like.

With the Office of Planning taking the lead, Souki convened about a group of around 60 people, representing federal and state agencies, some community groups, non-profits, and businesses (including insurers). With the help of Jim Dator, a futurist from the University of Hawai'i, “we were looking out 50 years or more, looking at future scenarios,” Souki said. Participants were asked to select a future and figure out how it could be achieved. “This served as a basis for climate change adaptation guidelines,” he said, which the Legislature passed in 2012 as Act 286.

“It’s a policy,” Souki said. “We’re the only state I know that has a policy passed by a legislative body and adopted by the governor. It’s integrated into the statewide planning act, so all land use decisions – decisions by the Land Use Commission, the Board of Land and Natural Resources, county zoning, all of that – need to take into consideration climate change adaptation.”

“The actual things you need to do aren’t defined, and that’s where our office comes in. We’re not the only agency working on this, but we have made it a priority of the Office of Planning to assist sister agencies in the state and counties to deal with the impacts — how to integrate policy into action.”

The update of the Ocean Resources Management Plan is an important step forward, Souki said. “It’s an interagency document – the governor signed off on it, federal agency partners agreed to allow us to use their logos, which shows their support.”



Hundreds of sandbags placed along the beach fronting the Ka'anapali Ali'i and Maui Marriott were swept away by ocean swells in summer and fall of 2003.

PHOTO BY: JONATHAN STARR

“There’s a lot of science out there” that supports the policy, he said. “The issue is: how do we connect that to on-the-ground decision-making that is ongoing? How does science inform that?”

The Bathtub Model

One of those who is wrestling with those questions on a near daily basis is Sam Lemmo, administrator for the Office of Conservation and Coastal Lands within the state Department of Land and Natural Resources. The OCCL is the agency that regulates development and construction on state-owned submerged and coastal lands, up to the shoreline, and on all Conservation District land.

In a phone interview with *Environment Hawai'i*, Lemmo said that climate change impacts were now being considered whenever his agency processes Conservation District Use Applications for work in coastal areas.

But figuring out exactly how climate change should be modeled is complicated, he acknowledged. The National Oceanic and Atmospheric Administration has published sea-level rise maps for Hawai'i, he noted, but “it’s a bathtub-model approach. It’s two-dimensional. There are certain things you don’t see in that data.”

What Lemmo calls the “bathtub model” predicts coastal flooding based only on the sea level rising at a certain rate over a certain period of time and does not consider other factors that come into play, such as storm surges that reach far inland or low-lying lands flooded by higher water tables. “There are other potential models,” he said, “and we’re interested in looking

for a higher resolution model for what sea-level rise will do to the Hawai'i shoreline.”

He acknowledged the plethora of studies already published that show the impacts of rising sea levels on the state’s shores. “It’s a lot of regurgitation of the same old thing, kind of like a broken record... They don’t really tell me anything. You need to show people what the actual change is going to be to your shoreline and show what facilities are being exposed to these threats,” he said.

What Lemmo wants, he said, “is a higher resolution model for what sea level rise will do to the Hawai'i shoreline,” including a beach vulnerability study. He has submitted funding requests, he said, and is hoping to work with the University of Hawai'i’s Coastal Geology Group to get the research under way.

Hoping for the Best...

Chip Fletcher is head of the Coastal Geology Group and associate dean of the School of Ocean and Earth Science and Technology. He is well known, both in and outside Hawai'i, for his research on shoreline processes and climate change. And while he harbors no illusions about the inevitable impacts of sea level rise, his outlook is not as bleak as one might expect.

“I see some rays of hope in Hawai'i,” he said, pointing to Lemmo’s request for help with a study of the effects of sea level rise on the coast. “He wants to know how sea level rise will affect beaches, and he wants it in a quantitative manner so he can use it in developing policy.”

Act 286, which amended the State Planning Act in 2012, “is a beacon of extreme hope,” he said. In addition, he was pleased to receive a phone call from a high-ranking administration official following up on a statement Fletcher had made to the effect that the only way to preserve beaches is to purchase coastal land. The official, he said “wants to discuss how to fund a study of this particular issue.”

Still, “we’re just at the beginning of planning,” he said. “Every single state department and county department needs to figure out how sea level rise and other factors impact our mission. There has to be a long, complicated discussion involving some sort of committee that will look at all the details – decreased rainfall, rising sea level, rising temperatures, greater exposure to tsunamis, storm surges, and hurricanes, heavier and localized flooding. There’s a plethora of potential impacts intersecting with a plethora of government activities. I don’t know anywhere this discussion has begun to take place.”

Pulling buildings and infrastructure away from the shore — an approach known as retreat — is just one of several ways to deal with sea level rise, Fletcher noted. Engineering is another, whether it takes the form of armoring the coast or building structures to withstand rising sea level and everything that entails.

“Forty years from now,” he said, “Hawai‘i will see just the tip of the spear of accelerated sea level rise. The National Academy of Sciences has predicted that, globally, we’ll see between seven and 19 inches of sea level rise by 2050. That averages out around a foot.

“But Hawai‘i for various reasons is going

to see above-average sea level rise. By the end of the century, the National Academy is predicting between 20 and 55 inches, or upwards of five feet.”

“The first thing we need to ask ourselves is: What will the impact on us be of a one-foot rise in sea level? Probably the most immediate one will be a broadening and acceleration of coastal erosion,” he said.

Fletcher noted that his group had recently done a study of beach erosion on the islands of Kaua‘i, Maui, and O‘ahu, finding that 70 percent of them are experiencing loss. Nine percent were completely gone, usually as a result of seawalls built to protect private property.

On Maui’s north shore, almost 90 percent of the beaches were eroding, his group found.

As the erosion increases, Fletcher said, the state and counties will be forced to wrestle even more with coastal property owners who want to protect their land with seawalls.

“The DLNR has wrestled with this for some time,” he said. Today, “it does not very often award permits for walls, whereas 15 years ago they used to; it was standard practice.”

A one-foot rise in sea level “will come up in the storm drains,” he said. “On the sides of every road, you have these pukas. That’s where rainfall runs to the ocean, but the ocean is already coming up in some of these places – Waikiki and Kaka‘ako on O‘ahu, Kahului on Maui. We’ll see salt water ponding in the streets.”

Roads will be heavily affected as well. “A one-foot rise will make worse the seasonal high waves impinging on roadways that are already seasonally inundated,” he said, giving as examples Kamehameha Highway on the windward side and north shore of O‘ahu.

“The areas that already have problems where the land and sea meet – those are already the first theaters of interacting with sea level rise,” he continued. “And this will only broaden and spread.”

Sea level rise will be most pronounced at high tide: “The highest tide of the day is where we’ll see the most flooding, the most wave overwash,” Fletcher said. “We’ll see waves running up on eroded beaches, crashing into houses – that sort of thing. Beach nourishment is going to become more common in Waikiki and Ka‘anapali. Millions of dollars will be spent on sand replenishment where the economics justify it. We’ve had a few cases of neighbors hui-ing together to pay a coastal engineer to design a beach nourishment project, but that’s not always successful. Everyone thinks we can go out and find sand to put on the beach, but high quality sand is a rare commodity.”

Buried infrastructure will also be affected, he said. “Where we have not replaced the sewer lines, where they are still heavily perforated, we’ll see more and more infiltration and inflow as the water table rises.” Infiltration and inflow can hasten corrosion of pipes and overwhelm sewage treatment plants, resulting in sewage spills.

A rise in sea level of around a foot by 2050 is a near-certainty, given the thermal expansion of the ocean and melting of the world’s ice. “But Greenland is doing some alarming things,” Fletcher said. “Some glaciologists believe that as the ice melts back to where it is finally on bedrock, the rate of retreat will slow tremendously, but that neglects the melting that is occurring on the surface.

“A paper came out in May that predicts that by 2025, there is a 50 percent probability that the entire surface of the Greenland ice sheet will go into a state of decay... So has Greenland crossed, or is it approaching, a tipping point?” If that happens, the widely accepted models of the Intergovernmental Panel on Climate Change would have to be revised substantially.

But, Fletcher concluded, “these are off-the-cuff observations. In the end, we go along with the consensus of scientists. I hope sea level rise will be a slower process than many people fear. I don’t think the sky is falling, but I do think the longer we wait, the more expensive it will be to deal with.

“We can still plan for sea level rise adaptation in a very considerate, thoughtful manner. But government agencies have to take a leadership role and exemplify good adaptation practices. The private sector will see that happening and follow suit.

“We should hope for the best but plan for the worst.”

— *Patricia Tummons*



Shoreline erosion, Kamehameha Highway, O‘ahu

National Park Service continued from page 1

stretches from Ka'upulehu south to Keauhou, as a ground water management area (WMA).

The Keauhou aquifer already supports most of West Hawai'i's wells and underlies lands targeted for urbanization by the Kona Community Development Plan.

With its petition, the NPS is forcing the Water Commission – for the first time – to assess the groundwater needs of public trust resources that are also necessary for traditional and customary practices.

Should the Water Commission find that designation is warranted, all current and future users of the aquifer system will need to acquire a water use permit from the commission. That includes not only the dozen or so operators of the 51 existing wells, but also new developments, such as the 1,143-acre master planned community known as Kaloko Makai, which proposes thousands of new homes, a school, a hospital, hundreds of resort units and commercial and industrial space upslope of the park.

A decision on the petition is likely months away. As of mid-September, Water Commission director William Tam had not read it.

"They've talked to us for the last couple of years. I didn't realize they were going to do this," Tam said.

Hawai'i County Department of Water Supply manager Quirino Antonio did not respond to questions by press time.

When asked how designation might affect development in the area, Peter Young, a consultant for Kaloko Makai, said simply, "We're looking into it."

Long Time Coming

It's been, in fact, several years that the NPS has been talking to the commission, and to anyone else who would listen, about its concerns that increasing groundwater withdrawals will eventually harm the culturally and ecologically important native species that rely that flow to survive and thrive. Those species include 'ama'ama (striped mullet), limu manaua (*Gracilaria coronopifolia*), limu kohu (*Asparagopsis taxiformis*), the orange-black damselfly (*Megalagrion xanthomelas*), 'opae'ula (*Halocaridina rubra*), the ae'o (endangered Hawaiian stilt, *Himantopus himantopus*) and the 'alae ke'oke'o (endangered Hawaiian coot, *Fulica alai*).

In 1999, the U.S. Geological Survey's Delwyn Oki determined that 6.48 million gallons a day of fresh water discharged into the ocean from the park before the onslaught of development in the area. But if all of the 30 or so wells permitted before 1998 were pumped at their maximum rate, Oki found that

groundwater flow from the park would drop to 47 percent of what it had been in 1978.

Since Oki's report, the Water Commission has approved permits for about 20 more wells for the Keauhou aquifer. Currently, the total permitted pumping capacity is 38 mgd, which is equivalent to the aquifer's sustainable yield.

What's more, the county has approved land use plans and zoning that may one day leave the park boxed in by development requiring six times the sustainable yield of the Keauhou aquifer system, according to the county's Water Use and Development Plan.

Current reported water use is only about 13 mgd, 34 percent of the sustainable yield. However, the petition notes, "Actual water use is not known because pumpage is not being reported for over two-thirds of the permitted production wells in the aquifer system."

As early as 2008, the NPS convened stakeholder meetings to investigate ways to conserve water and protect the park's resources. But with the county's competing group, the Kona Water Roundtable, sometimes holding meetings on the same day, the park service eventually stopped its efforts. In December 2012, the roundtable finally included a presentation by the NPS on its agenda.

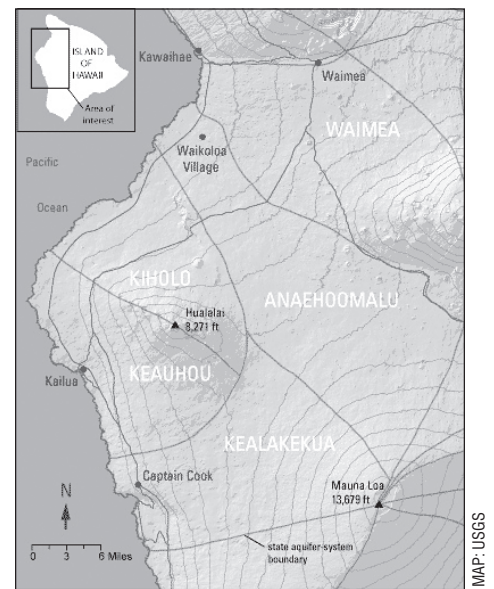
"Despite six years of efforts by the Water Commission, the Park, and other stakeholders to address the potential impacts of proposed development at the Kona Water Roundtable and other venues, no plan has been produced to protect water-dependent cultural and natural resources from the cumulative effects of groundwater withdrawals," states an NPS press release announcing the petition.

'Sustainable' Yield

Some people just aren't convinced that the park's resources are in danger of losing their freshwater supply.

At a September 19, 2012, Water Commission meeting where the NPS presented evidence that groundwater pumping was already causing increased salinity in parts of the park, Peter Young, who was also former Water Commission chair, testified that recent studies suggest there is far more fresh water available from the Keauhou aquifer than previously thought.

Young referred to a 2011 USGS study by John Engott that recalculated the likely recharge to aquifers across the island. For Keauhou, Engott found, the recharge rate was about 77 percent higher than the rate used in 2008 by the Water Commission to calculate the sustainable yield of 38 mgd. Even under various climate change scenarios,



A U.S. Geological Survey map of hydrologic units in West Hawai'i.

Engott found the recharge rate to be significantly higher than 87 mgd, the rate used by the Water Commission.

Young has also pointed out that recent well drilling by hydrologist Tom Nance discovered a cache of freshwater beneath saltwater in the area.

"A sustainable yield of 38 mgd is most likely low," Young told the commission.

The NPS petition, however, argues that "[t]he feasibility of developing one or more artesian freshwater zones below salt water for drinking water ... is highly speculative, as is the assertion that wells tapping this zone will not reduce groundwater discharge to coastal ecosystems."

It also points out that the method used to calculate the sustainable yield – the Robust Analytical Model – assumes that pumping is uniformly distributed. It is not, the petition states, adding that the Water Commission itself has recommended that because of the lack of site-specific data, the sustainable yields "should be used as a guide in planning rather than an inflexible constraint."

The petition continues that the RAM also assumed that all groundwater pumping comes from basal aquifers when, in fact, the Keauhou aquifer includes higher elevation groundwater.

The relationship between the two areas, however, is still being investigated. In March of 2012, the Water Commission and the NPS funded a USGS study that proposed to track isotopes in rainfall to follow how water moves from the high-level groundwater system to the basal aquifer. The USGS has completed its data collection, but had not released any results as of press time.

In any case, the sustainable yield may

State Leaders Underscore Priority Of Dealing with Water, Climate

In Hawai'i, we consume the most water per capita in the United States," U.S. Sen. Brian Schatz said at a forum on water and climate change held in the state Capitol auditorium on August 19. More specifically, local residents use 18 percent more water than average Americans, he said.

With projected population growth — 350,000 more people by 2040 — and increased demand (not to mention reduced precipitation as a result of climate change), the state must work now toward ensuring an adequate supply of water, he continued.

"We can do it. We must do it. Hawai'i has set an example for the nation with our energy policies," he said. "We should also replicate it [and] become an example for the stewardship for our water resources."

Schatz, as chair of the Senate's water and power subcommittee, said he convened the forum to hear a variety of local perspectives on water supply issues and to learn more about the impacts climate change will have in Hawai'i. Together with a similar panel discussion at the Hawai'i Conservation Conference, also held in August, it seems that resource managers at the state level and

on O'ahu, at least, are well aware of the potential impacts climate change will have on supply and are working to mitigate them.

"We keep thinking that future end game, that black swan ... is not going to happen to us," said state Commission on Water Resource Management director William Tam, who spoke at both events. "We have to rethink how we live here."

Mauka to Makai

Data indicating that climate change has caused drops in rainfall and stream flow throughout Hawai'i have been available for some time. For state Department of Land and Natural Resources director William Aila, the impacts of climate change became personal only recently.

"This past Thursday, coming back from

protect the water quality of an inland well, but "it does not prevent saltwater intrusion at the coastline," the petition states, noting also that the Water Commission only has two monitoring wells in the area and they are more than seven miles away from the park.

"The RAM methodology ... does not explicitly consider the impacts of reducing groundwater discharge by 44 percent on traditional and customary Native Hawaiian rights and practices and other public trust resources along the Kona Coast," the petition states, adding that the Water Commission recognized this in its 2008 Water Resources Protection Plan.

Climate Change

The Water Commission is currently updating its Water Resources Protection Plan, which will likely include revised sustainable yields. These will incorporate new precipitation models from the USGS that, for the first time, include recharge from fog drip.

As Engott's study found, in most cases, the recharge for the Keauhou region is likely vastly higher when fog drip contribution is considered. However, in drought conditions, Engott found, the sustainable yield in Keauhou is a mere 28 mgd.

With the drier conditions and rise in sea level expected as a result of climate change, the University of Hawai'i's Center for Island Climate Adaptation and Policy (ICAP) has suggested that the Water Commission start now to identify and designate the state's most vulnerable areas.

In ICAP's 2012, "Water Resources and Climate Change Adaptation in Hawai'i: Adaptive Tools in the Current Law and Policy Framework," authors Richard

Wallsgrrove and David Penn argued that WMAs provide for more adaptive management by the Water Commission compared to non-designated areas.

"In addition to the powers of the [Water Commission's] permitting process, designation can also promote adaptation [to climate change] through improved monitoring and inventorying of water resources," they wrote.

They also argued that a statewide permit system was always the intended goal when the Water Code was adopted decades ago.

"A review commission was established and tasked with reporting to the Legislature on various matters, including the adoption of a statewide permit system. The commission recommended such a system in 1994, but it has not been adopted. Presently, only Moloka'i, most of O'ahu, and the 'Iao aquifer on Maui have been designated as ground WMAs. In 2008, Na Wai 'Eha, Maui was designated as the first surface WMA since the Code's inception," they wrote.

The criteria for designating groundwater WMAs include whether:

- use or authorized planned use may cause the maximum rate of withdrawal to reach 90 percent of the sustainable yield;
- the Department of Health determines that water quality degradation is occurring or is threatened;
- groundwater levels decline;
- existing withdrawals endanger the groundwater due to the encroachment of salt water;
- excessive preventable waste of groundwater is occurring; or
- serious disputes respecting the use of groundwater are occurring.

Penn and Wallsgrrove point out that,

whether or not any of those criteria are met, the Water Code directs the commission to designate a WMA "when it can be reasonably determined ... that the water resources in an area may be threatened by existing or proposed withdrawals or diversions of water."

"Climate-related phenomena, such as the declining trends in rainfall and base flow, unquestionably pose a threat to water resources. WMA designation is a long process. The earlier that a threatened hydrologic system is designated, the more effective the process can be in protecting the threatened resource," they wrote.

The NPS petition also points out that in 2012, the state Legislature passed a bill amending the Hawai'i State Planning Act to "encourage state and county agencies to integrate climate adaptation policy into their long-term planning, and to consider traditional Native Hawaiian knowledge and practices in planning for the impacts of climate change. ... A designated [WMA] is one forward-looking adaptive tool that the commission can use to make a critical difference in Hawai'i's water future and adaptation to declining rainfall and rising sea level." — **Teresa Dawson**

For Further Reading

The following articles are available on the Archives page of our website, www.environment-hawaii.org.

"Honokohau Act Confuses DLNR, Angers West Hawai'i Boaters," October 2012;

"Kaloko-Honokohau Park Voices Concern Over Update to Hawai'i County Water Plan," November 2011.

a cabinet meeting in Kona, I arrived home to about seven fire trucks in my yard," battling a fire in what used to be a sugar plantation reservoir. Aila blamed the changing weather patterns.

"We used to have regular summer rains. There have not been any summer rains for the last 10, 15 years," said Aila, a lifelong resident of Wai'anae on O'ahu's leeward coast. "The brown time seems to be expanding. We used to get rains all the way through May. Now, it's to February or March. Rains used to rain out Halloween. We don't get rains 'till Thanksgiving now," he said. "This entire reservoir was reduced to grass, brown grass, that burned hotly and intensely for eight hours."

For more than a year now, with its Rain Follows the Forest campaign aiming to double the amount of protected forest areas over the next decade, Aila's department has been a forerunner in the state's effort to combat the impacts climate change is expected to have on the state's water supplies and ecosystems.

Aila said that when he started his job as head of the DLNR, he quickly began to receive briefings from scientists about the future being drier and bringing more intense storms to the islands.

"Now that you know about it, you can't ignore it. ... A good forest acts as a sponge" that benefits not only the state's aquifers, but its marine organisms as well, he said.

"We have a very strong mauka to makai relationship," he continued, noting that pelagic fish rely on a certain amount of larval fish from coral reef ecosystems for food. And those larval fish rely on freshwater discharges into the ocean.

This past legislative session, the Rain Follows the Forest program received appropriations totaling \$11 million over two years.

When discussing ways to ensure the state has adequate water for agriculture, Aila hinted at a rift in his department over implementation of dam safety rules adopted by the Land Board years ago in response to the Kaloko reservoir breach on Kaua'i that killed seven people. The rules potentially require dam and reservoir owners to make expensive improvements.

"Carty pulls his hair out whenever I talk about dams," Aila said, referring to Carty Chang, head of the DLNR's engineering division, charged with overseeing dam safety and implementing the rules.

"If we are to become more self-sufficient, we need to store more water," Aila said, adding that he is looking at ways to manage dams and reservoirs "in a more flexible way than our engineers had envisioned."

Draining dams may be good from a safety standpoint, but it's not good for agriculture, he said.

'Reduce, Reuse, Recycle'

Climate change is definitely putting the Honolulu Board of Water Supply in a pinch. If the steady decrease in rainfall over the past few decades is factored into the sustainable yield for the island, pumpage is already at capacity, said the BWS' Barry Usagawa at the Hawai'i Conservation Conference. Currently, the permitted capacity is 294 mgd. On an average day, only about 180 mgd is used.

The BWS currently serves nearly 1 million people, a number that is expected to grow to 1.1 million by 2030. Under the current sustainable yield of 407 mgd, there is still ample capacity to grow, Usagawa said.

"By 2030, we should be okay. What happens if the sustainable starts to decrease because of lower rainfall, when the wells are too concentrated [and] pull up brackish water? We're always constantly looking at that," he said.

The agency hopes to control development so it doesn't damage the ability of the island's aquifers to recharge, said BWS engineer Ernie Lau at Schatz's forum. In addition, Usagawa said, the BWS has developed a policy to minimize production of new water sources on the island's windward side because tapping the high-level dikes there would impact streams.

To protect traditional and customary practices, the BWS has adopted a policy not to develop any new sources that affect surface water, Usagawa said.

To help preserve the island's overall water supply, the BWS has recently entered into agreements with the DLNR to fund the protection of forested recharge areas and control invasive species, among other things.

Usagawa said he was embarrassed when he found out Maui County donates \$2 million annually to watershed partnerships. Until recently, O'ahu had only donated about \$20,000 a year to partnerships with the DLNR.

The BWS has also been investigating ways to improve conservation and develop alternative water supplies, including recycled/brackish water and desalinization.

Tam has frequently touted the idea of recycling the wastewater that feeds the city's treatment plants at Sand Island and Honouliuli.

"At Sand Island, 60 million gallons of wastewater goes into the ocean. At Honouliuli, it's 20 to 30 million gallons. [That's an] asset we're throwing away," Tam said at the HCC.

The BWS currently recycles eight to ten

mgd of wastewater at the Honouliuli plant and is "very interested in expanding as the plant goes to secondary treatment," said Lau at the state Capitol forum.

The City and County of Honolulu has not yet needed to develop a desalination plant because of the success of its conservation programs, Usagawa said. (One was built in the early 1990s, in a three-way partnership involving the BWS, the DLNR, and the Campbell Estate. The \$8 million plant never worked well and was later abandoned.)

When asked about ways to expand the use of recycled water on O'ahu, Usagawa said the technology exists to do small-scale, on-site recycling, but "we lack the leadership."

The need for recycled water is also there, he continued, pointing to the municipal Ala Wai golf course as an example.

"A sewer transmission main goes through [the property]. The caprock wells are salty, [so] they're using potable water. They can use recycled water," he said. But it takes three county departments to come together to make it happen: the Department of Enterprise Services, the Department of Environmental Services, and the BWS, he said, adding that if they ever find a way to make it happen, it would save 250,000 gallons of potable water a day.

"The University of Hawai'i College of Engineering came up with conceptual designs. I can't get it moving forward," he complained.

Effluent-cleaning facilities could produce irrigation water for golf courses in Makaha, and for landscaping in Mililani if the Koa Ridge development ever gets built, he said.

The city's Wahiawa wastewater treatment plant is expected to soon produce high-quality recycled water, which farmers will use, he added.

Stream Gages

At Schatz's forum, one glaring weakness in the state's effort to deal with climate change stood out: the loss of U.S. Geological Survey long-term stream gages.

In the 1970s, the agency operated 200 stream gages across the state. But due to a lack of funding, today, there are only 58, reported Stephen Anthony, director for the USGS Pacific Island Water Science Center.

"We need good data. We are losing gaging and rainfall stations. ... That's the early warning system. That's the canary in the mine," Tam lamented.

University of Hawai'i coastal geologist Chip Fletcher added that monitoring streams at a time when rainfall is decreasing, "that's a period where we need to know much more."

— T.D.

BOARD TALK

DLNR to Create Trust Fund For Coral Reef Restoration

We need it yesterday," Department of Land and Natural Resources director William Aila said of the proposed new scheme to help his department restore damaged reefs and bill those responsible.

During a September 12 briefing, Aila's deputy director, William Tam, explained to the Board of Land and Natural Resources that the program, initiated by the DLNR's Division of Aquatic Resources (DAR), would mirror one employed by the U.S. Army Corps of Engineers to restore wetlands destroyed by construction projects. Under that program, when a Corps-permitted project is expected to harm or destroy a wetland, the permittee must fund and implement a restoration project that provides ecosystem services equivalent to the expected loss.

Regarding damages to Hawai'i reefs and potentially other natural resources managed by the DLNR, the department plans to establish a "mitigation bank" into which responsible parties can pay fines – if the damages are inadvertent – or contribute money to restoration activities to offset impacts from a permitted project.

How badly does the DLNR need this program?

"We [need] look not much further than today's headlines and probably tomorrow's headlines," Aila said, referring to the spill by Matson days earlier of 233,000 gallons of molasses into Honolulu Harbor. The spill suffocated tens of thousands of fish and turned live corals ghostly white almost overnight.

Matson has committed to paying for all damages resulting from the spill. Tam said that besides having to pay fines under the Clean Water Act, the company will also have to address damages to the marine ecosystem.

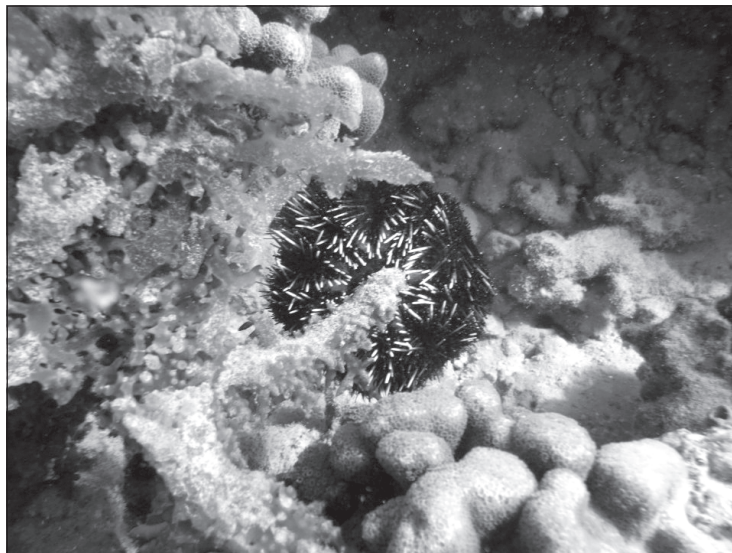
"That's a natural resource case that is going to happen," Tam said.

For now, the DAR is starting the process of getting the mitigation bank approved by the Army Corps. According to DAR invasive species specialist Kate Cullison, the division planned to submit a draft prospectus to the Corps by the end of last month.

"It's the very fist of a series of more complex documents to be submitted," she told *Environment Hawai'i*, adding that it will take several months for the Corps to complete its reviews.

If and when the Corps approves the establishment of a bank, DAR will then submit a natural resource management plan to the Land Board for approval, she said.

While the primary focus of the program will be on corals, it has larger implications for the department, Tam told the board.



The DLNR's proposed mitigation bank could fund ongoing restoration projects, such as the raising and release of sea urchins to help control invasive algae in Kane'ohe Bay.

PHOTO: HAWAII SUPER SUCKER FACEBOOK PAGE

The Land Board is obliged to protect the state's public trust resources, including submerged lands. Although rules and statutes give the board the power to issue fines and assess administrative costs, as well as costs associated with restoration of damaged areas, "we've done this on catch-as-catch-can basis in the past," Tam said.

The board has sometimes struggled to determine the value of natural resources that have been damaged. In a decade-old Land Board case involving reef damages at Pila'a Bay, Kaua'i, the Hawai'i Intermediate Court of Appeals expressly stated that the board can choose how to assess damages, Tam said. However, that case has been appealed to the Supreme Court, which heard oral arguments earlier this year. Whether the court will share the ICA's opinion remains to be seen.

In any case, Tam said he anticipated the

Land Board will be contending with valuing natural resource damages more and more.

Already, the state's coral reefs are getting banged up on a regular basis, and without any restitution paid to the state. Sinking boats, vessel groundings, and anchor damage can really add up, Cullison told the board. On average, she continued, there are 168 reported coral reef damage incidents per year.

"We can assume there are many more. Most are on O'ahu and Maui," she said.

DAR focuses most of its response on securing vessels and salvaging them. But there is no process set up after that to assess damages, she said.

"The larger groundings, we have less of a process that's spelled out. There have been three large ones in the past several years. All have been treated differently," she said, referring to the *Cape Flattery*, *Voge Trader*, and *USS Port Royal* groundings. (See the February 2013 cover story for more on this.)

Without a process in place, Cullison said, the DLNR is missing opportunities to recover damages.

Planned Impacts

One of the biggest bottlenecks for projects that require an Army Corps permit is the mitigation plan. "The Army Corps of Engineers' goal is no net loss" of habitat, Cullison said.

A mitigation bank could save permittees from developing and implementing a mitigation plan, she continued. The state Department of Transportation, for example, is planning to expand Kapalama harbor and is

expected to destroy some 7,000 corals in the process. Under the proposed program, the DOT would pay into the bank an amount agreed to by the DLNR and the Army Corps covering the cost of a restoration project that offsets the coral damage. The DLNR would then be responsible for conducting the restoration and the harbor expansion would be allowed to proceed unfettered.

The restoration projects would not necessarily be tailor-made in response to a particular construction project. They would more likely be projects already ongoing, i.e., invasive algae removal at Kane'ohe Bay. Projects would, however, be located within the same county of the proposed permitted activity.

Cullison said the DLNR would choose restoration sites that are already somewhat degraded but which could be improved with management. The sites would also have to

host a diverse range of species.

This approach is "usually much more effective than piecemeal projects," Cullison said. "We are hoping this will provide some level of cost recovery [so we] can do enhancement, restoration, creation, and preservation."

All restoration projects would have to be approved by an independent review team composed of representatives from the National Oceanic and Atmospheric Administration, the Fish and Wildlife Service, the Environmental Protection Agency, and, of course, the Army Corps, which would chair the team.

In addition to reviewing all project proposals, the team would re-evaluate projects every year. The DLNR would also have its own internal scientific review team, and the Land Board would also approve any modifications to its mitigation and restoration plan. That plan could include projects such as a sea urchin hatchery, the use of super suckers to remove invasive algae, and a coral nursery, Cullison said.

"It's a fast way to solve some of these problems," Tam said. "We're going to start taking these ideas to other areas."

Board Questions

At-large board member San Gon said he appreciated the fact that the DLNR has an opportunity to standardize its response to repeated patterns of damage and focus on restoration. However, he added, "I know the devil is going to be in the details of this thing."

With runoff, for example, which causes significant damage to reefs, "on the one hand, it's a consequence of rains; on the other hand, it's the result of decades of loss from ungulates. ... How do you tease out long-term landscape change and perhaps a particularly wet winter, and those ascribable to a particular thing?" he asked.

Maui member Jimmy Gomes asked whether the DLNR had adequate staff to manage the program and to implement restoration projects.

Tam admitted that his division would have to build that capacity.

Aila said the Army Corps and other federal partners are very supportive and interested in the DLNR's proposal.

"It hasn't been done anywhere in the country in applying it to coral reefs," he said.

Should the bank be established, it would eliminate the confusion that's occurred in the past over whether settlement funds from reef damages go to the state general fund or to the DLNR.

Whatever money is paid into the bank will be "kapu money," Tam said, adding, "We're

going to try to [have] our documents to say this is a trust fund, not a special fund" that can be raided by the Legislature.



Rail Can Use State Land, But May Have to Pay Rent

The Land Board on September 13 unanimously granted two non-exclusive easements, a right of entry, and a lease to the Honolulu Authority for Rapid Transportation (HART) for rail-associated facilities Aloha Stadium and on agricultural land in Kapolei across from the University of Hawai'i West O'ahu campus.

"You're saying you want to use that area without paying the state?"

— Jimmy Gomes, Land Board

Despite objections from HART deputy executive director Brennon Morioka over DLNR provisions allowing the state to seek compensation for the city's use of state land, the Land Board approved the encumbrances as recommended by the DLNR's Land Division.

"You're saying you want to use that area without paying the state," Maui Land Board member Jimmy Gomes asked Morioka before voting on the easement at the stadium.

"That's been our relationship with other state agencies," Morioka said. He argued that the value of having a rail stop at the stadium

is compensation enough.

Allowing the state to negotiate fair compensation for the easement "doesn't provide us with some level of assurance with our ability to plan. We do not have a budget for any future lease rent payments," Morioka continued.

Stadium Authority manager Scott Chan countered, "All we're asking for is we make sure we do not close the door on asking for fair compensation. We need to consider monetary values because of utilities and costs we incur."

With regard to the Kapolei properties, Honolulu Department of Planning and Permitting director George Atta sent a letter to the DLNR offering to try to get the lands upzoned, in lieu of monetary compensation,

Land Division administrator Russell Tsuji told the board.

"What they're proposing is quite valuable. It's a tough area to get zoned," he said.

Tsuji noted that rezoning would require approval from the city council, and should it fail, the DLNR would have the opportunity to seek monetary compensation.

Again, Morioka objected. Paying for use of public lands is not in HART's budget, current or future, he said.

"It would require us to re-look at our budget and would lead to increasing fares," he said.

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Finally, several donations have been made to honor the memory of Susie Yong:

Anonymous
Doug Lamerson
Chris Loos
Patricia Tummons.



Board Denies Contested Case, Urges Farmer to Cure Violations

On September 13, the Land Board denied native Hawaiian farmer Ku'i Palama a contested case hearing on violations regarding his unauthorized occupancy and use of state land in Hanapepe, Kaua'i.

Even so, because Palama had documents suggesting he may have a legal right to use adjacent private land, Land Board chair William Aila offered to help Palama secure a stream channel alteration permit for his auwai from the state Commission on Water Resource Management. Kaua'i board member

Shawn Smith also volunteered to be a liaison between the Palama family and DLNR land agent Milo Spindt, who clearly have problems with each other (threats have allegedly been made by both sides). Ku'i Palama also still had some belongings on the state property and had reoccupied it as well, according to DLNR staff.

The board denied Palama a contested case hearing because he did not request one orally when the Land Board voted earlier this year to fine him \$5,000 for growing taro on the state's land, and also did not properly file a written petition, a staff report states.

Despite Palama's initial arguments that the state of Hawai'i has no authority over land and the continuing violations, Aila seemed supportive of Palama's efforts to rehabilitate

the land. The board has said it is good for people to be self sufficient, Aila said.

"We would work with you to grow taro, but you have to clear the violations first," he told Palama. "Let's work together to reach compliance."

At times, Palama tried to argue that diverting the stream was part of his kuleana right and that the state was wrong in blocking access to his property.

"I'm not trying to play hard ball. I'm just trying to grow food to feed my family," he said.

In the end, though, he seemed willing to leave the state property and work toward getting a permit to divert water to private lands. At his request, Aila gave Palama ten more days to clear out. — T.D.