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IMPACT REPORT  
Q1

FIRST QUARTER



People,  
Place,  
Promise



**College of Tropical Agriculture  
and Human Resources**  
University of Hawai'i at Mānoa

*The founding college of the  
University of Hawai'i, established 1907*

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1907

## FIRST QUARTER

# Q1

### College of Tropical Agriculture and Human Resources **People, Place, Promise**



*“On an average day in Hawai‘i, 280 people receive direct help from the College of Tropical Agriculture and Human Resources.”*

On May 8, 1914, President Woodrow Wilson signed the Smith-Lever Act establishing the Cooperative Extension Service (CES), the world’s largest non-traditional education system. In 1928, U.S. Department of Agriculture Extension agents in Hawai‘i were transferred to the University of Hawai‘i, which had been providing agricultural and home economics outreach since it was founded as the College of Agriculture and Mechanic Arts in 1907, and UH President David Crawford was named director of Extension.

The CES serves nearly all 3,150 counties in the 50 states as well as all of the U.S. Territories. A partnership between land-grant universities, such as UH Mānoa, and federal, state, and local governments, CES has responsibility for providing science-based information and educational programs in both urban and rural environments and communities.

Research-based Extension education for farmers and ranchers has helped establish the United States as a leading agricultural-producing nation and continues to support Hawai‘i’s move toward greater food and fuel self-sufficiency. Nationwide, the 4-H youth development program has helped to prepare millions of young people for responsible adulthood. Cooperative Extension programs also strengthen families, promote healthful living, build community leadership, and nurture food and fiber business development.

On an average day in Hawai‘i, 280 people receive direct help from the College of Tropical Agriculture and Human Resources’ 65 FTE Extension agents and specialists as well as other CTAHR faculty and support staff on the UH Mānoa campus and at 28 Extension and research stations across O‘ahu, Hawai‘i Island, Maui, Moloka‘i, and Kaua‘i.

Aloha,

Maria Gallo  
Dean and Director of CTAHR

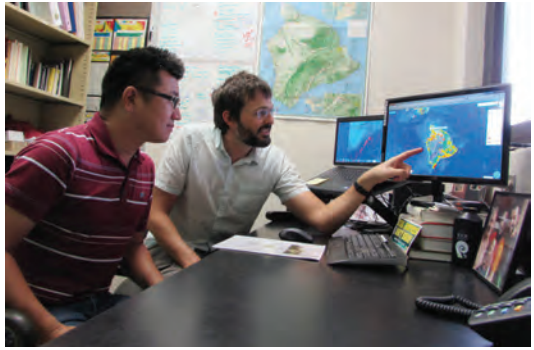
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# Fired Up About Data Mapping

Listen to Clay Trauernicht discuss his passion, and you'll realize you haven't been paying enough attention to wildfires in Hawai'i. Fortunately, with the help of Tomoaki Miura's GIS data-mapping project, he's created a website and interactive map to help address this issue.

Many may not realize wildland fires are a serious and growing problem in the Islands. But data compiled by the nonprofit Hawaii Wildfire Management Organization, which Dr. Trauernicht used to create the map, show a trend long suspected by fire responders and land managers: though the land area affected is much smaller than in states more associated with forest fires, the *percentage* of land area is approximately equal—some years even higher. On average, over 1,000 ignitions involve more than 17,000 acres a year. “We’re running off a cliff in terms of wildfires in this state,” he warns.

Historically wildfires haven't gotten much publicity in Hawai'i, though, and resources have been correspondingly lacking. There are no specially dedicated wildfire fighters, except on military bases and at Hawai'i Volcanoes National Park; all other crews combine this duty with their full-time day jobs.



*Tomoaki Miura and Clay Trauernicht trace wildfire ignitions on the Big Island.*

Applying for funding—for prevention, management, and recovery—is an important use for the Hawaii State Wildfire History website (<http://gis.ctahr.hawaii.edu/WildfireHistory>), which shows ignitions on all islands by location, land area, and date. State and county agencies can use the information to petition for support, while individual towns or communities need it to develop Community Wildfire Protection Plans. These justify federal funding for risk mitigation (e.g., fire breaks) and infrastructure like access routes and helicopter dip tanks for dumping water on the flames.

Dr. Miura is excited at the potential uses of the map, the first to go public of several projects using the powerful data-mapping infrastructure he and his team have developed. “We wanted to provide a service to researchers and extension specialists in the college,” he explains, because the maps created can then be utilized by the larger community.

As Dr. Trauernicht points out, the emerging pattern of ignitions confirms that, unlike on the Mainland, almost all are caused by humans. And that just may be the greatest benefit of the map—because knowing the effects of our behavior is the first step to changing it.

*Photo courtesy of Dr. Trauernicht for the Pacific Fire Exchange ([www.pacificfireexchange.org](http://www.pacificfireexchange.org)), a consortium of federal, state, and local partners he helps to coordinate.*





## Social (Media) Butterflies

**F**orget putting up paper flyers for lost valuables—entomologists William Haines and Daniel Rubinoff are using Facebook and smartphone apps to search for and recover an even more prized quarry. Their Pulelehua Project, funded by the Hawaii Department of Land and Natural Resources, is a citizen science initiative that encourages the public—especially hikers with smartphones—to report and hopefully photograph the elusive Kamehameha butterfly, Hawai‘i’s state insect, so researchers can map its population throughout the state.

The Kamehameha butterfly (*Vanessa tameamea*) is endemic to Hawai‘i, meaning it lives nowhere else in the world. Although it has been historically found on all the main Hawaiian islands, it’s disappearing from areas where it used to be common. “It’s one of only two native butterflies that we have in Hawai‘i,” Dr. Haines said. “It’s a component of the biodiversity that would really be a shame to lose.”

The project offers a website ([www.KamehamehaButterfly.com](http://www.KamehamehaButterfly.com)) and Facebook page ([www.facebook.com/PulelehuaProject](http://www.facebook.com/PulelehuaProject)) where the public can learn how to identify the Kamehameha butterfly, or pulelehua, in all its developmental life stages, as well its favorite plants and habitats. The caterpillars feast on the leaves of the māmakī plant, or Hawaiian nettle, which is found in remote areas like high-elevation forests or the very back of deep valleys. This is why the scientists need help from those who venture into these places. The butterflies and caterpillars should not be collected, since they are protected as native wildlife; a photo is all that’s needed to document them.

Anyone who spots one can submit their information to the project. Interested butterfly chasers can also check on the most up-to-date number of confirmed sightings on each island. “Every single person that gives us data makes that picture clearer and clearer,” said Dr. Rubinoff. “Once we have a really clear picture of how it’s doing, we’ll be able to identify the threats that it’s facing and help it face those threats more effectively.”

And getting the public actively involved has already paid off. The project has received over 100 submissions, leading to confirmations on five islands. These include residential areas of Windward O‘ahu and low elevations on Moloka‘i, where Dr. Haines and Dr. Rubinoff did not expect the butterfly to be found. It turns out the butterfly may have more friends on Facebook than anyone knew, and they may be a key to its survival.



*Dan Rubinoff displays pulelehua look-alikes on the project website.*

*William Haines communes with a Kamehameha butterfly perched on a māmakī plant.*



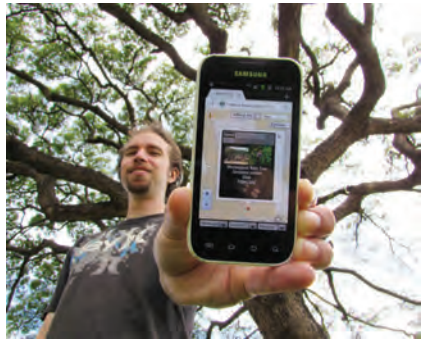
# Urban Re-Leaf

**S**ometimes it's the next generation of thinkers and learners that is best equipped to deploy the next generation of technology. Everyone has seen youths navigating the often bewildering technological landscape with ease, so it's only fitting that a pair of students has created a fun, useful, and user-friendly app to bridge the increasing divide between the natural and the digital world.

CTAHR undergraduate Nate Ortiz, who works as a landscape assistant when he's not taking classes, partnered with Zoology student Austin Stankus to develop the UHM Plant Map (<http://manoa.hawaii.edu/landscaping/plantmap.html>), which allows users to search, sort, and navigate through every single tree on campus from desktop or mobile devices. Each clickable tree yields an image, general information, and links to more detail, and searches can be delimited to yield all poisonous trees, agricultural crops, canoe plants, medicinals, and more.

The target audience is two-fold: landscape crew and supervisors use the system for grounds management, while the general public can more knowledgeably navigate the landscape. This project supports sustainable management decisions while simultaneously increasing the educational potential of the landscape, in keeping with the campus's recognition by the Arbor Day Foundation as a USA Tree Campus for its unique botanical treasures and its commitment to planting, preserving, and educating the university and the larger community about them.

Ortiz is also involved, along with fellow CTAHR students Andrew Dedrick and Mitchell Loo, in another type of collaboration between the green and the urban landscape. The three are co-founders of Urban Farm Hawai'i, a nonprofit hui aimed at proving that just about any area can support food production. Witness their latest project: planting taro along a Kaka'ako thoroughfare, in a patch of land fronting the former CompUSA store. The students expect to harvest huli, lu'au leaves, and at least one crop of taro before the area is redeveloped. Likewise, they've planted a row of banana trees in a nearby parking lot that are already developing harvestable keiki. If proliferating technology and urban spread are the hallmarks of the future, we're lucky that these students will be there to help integrate them with agriculture.



*Nate Ortiz shows his app's information on the monkeypod tree he's standing under.*

*The baobab tree on the UH Mānoa campus may be the largest in the United States.*





## Click-a-Pest

**W**hat's great about Extension work is it extends both ways. One recent example of this synergy was the discovery and mapping of a new coffee pest, an emaravirus that potentially makes coffee cherries unmarketable. The coffee disease, not known to exist elsewhere, was first reported in January 2014 by a coffee farmer in Kona, using the Plant Doctor app developed by plant pathologist Scot Nelson. Originally created in 2009, the app was re-launched in 2012 to provide completely free diagnoses, and a Spanish-language option was added in 2014. Last year, diagnoses were provided for users in 42 states and 35 countries.

Extension agent Andrea Kawabata, who's been helping coffee farmers deal with another pest, the coffee berry borer, and researcher Mike Melzer followed up with the farmer who first reported the disease. Dr. Melzer identified the virus associated with the symptoms, but much remains to be discovered. Members of the community can help them learn more, particularly about the pest's geographic range. After visiting the website Dr. Nelson created to depict the disease symptoms, growers can contact him via his Plant Doctor app or at [snelson@hawaii.edu](mailto:snelson@hawaii.edu), or Ms. Kawabata at [andreak@hawaii.edu](mailto:andreak@hawaii.edu).

This digital image submission process is similar to that of another app created by Drs. Nelson and Richard Manshardt, dubbed "Pic-a-Papaya." It asks the general populace to photograph papaya plants for diagnosis of symptoms caused by the devastating ringspot virus. When they use the app to send photos of the affected plants to the scientists, they'll help them map the extent of the disease—and combat it, because in return the users can request free papaya seeds to replace the diseased plants. Participants can also submit leaf tissue samples to test for GMO status and receive free non-genetically engineered seeds to replace them.

While the Hawaii Department of Agriculture (HDOA) plans to survey the farms in the Kona area to determine the spread of the new coffee virus, this will take time, time that may better be spent actively working towards control. "We can't just use a top-down approach anymore," explained Dr. Nelson. "The HDOA is our boots on the ground, but how long will it take for their agents to drive to every farm and walk around it to spot the virus? The farmers need to get involved." And these technological tools are allowing them to do just that.

*Scot Nelson shows his Plant Doctor app, which was used to alert him to the coffee virus displayed on his screen.*



*The Pic-a-Papaya app guides users through taking and sending pictures of ringspot-infected plants.*

