SB2473

Testimony

Measure Title:	RELATING TO AIR QUALITY.
Report Title:	Vog; Air Quality; Appropriation; SOEST ($)
Description:	Appropriates funds for a dispersion modeling center within the school of ocean and earth science and technology at the University of Hawaii at Manoa in order to improve vog forecasts for the State.
Companion:	
Package: None	
Current Referral:	HEA, WAM
Introducer(s):	GREEN, BAKER, CHUN OAKLAND, Espero, Ruderman, Shimabukuro, L. Thielen

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. Box 3378
Honolulu, HI 96801-3378
doh.testimony@doh.hawaii.gov

Testimony in SUPPORT of S.B. 2473
Relating to Air Quality

SENATOR BRIAN T. TANIGUCHI, CHAIR
SENATE COMMITTEE ON HIGHER EDUCATION AND THE ARTS

Hearing Date: February 9, 2016 Room Number: 224
Time: 1:30 PM

Fiscal Implications: $150,000 from general funds.

Department Testimony: The Department of Health supports this bill to provide funding for the maintenance and continued operation of the University of Hawaii's Vog Measurement and Prediction Project (VMAP) model. The VMAP model is used by government agencies, local news stations, and the community to predict sulfur dioxide and sulfate particulate concentrations in areas of the Big Island and throughout the state. This information helps to alert residents and allow them to adjust their daily activities to minimize the impacts of vog. The Department of Health also uses the VMAP model to predict air quality conditions and make no-burn decisions.

Thank you for the opportunity to testify.

Offered Amendments: None

I support SB2473, a bill to secure steady funding for the Vog Measurement and Prediction, or VMAP, Project run by the University of Hawaii at Manoa. The forecasts of 'vog' produced by this group are the most reliable and detailed information available to the public to help prevent undo exposure to high-levels of pollutants in an otherwise pristine environment. Without such a system in place, there would be less warning for impacted communities, organizations, and enterprises across the state.

I work on VMAP research and receive numerous emails each week from individuals looking for information on or relating to vog. I have learned that this is an issue that impacts many people for a variety of reasons ranging from personal health to economic viability. These groups of people rely on forecasts produced by VMAP on a daily basis to make decisions. Additionally, I have learned that the Hawaii Department of Health considers these forecasts to when issuing burn permits. Other institutions make use of these forecasts for their own purposes.

Website statistics for the VMAP site collected through Google have revealed several trends as well. Website traffic is steady at about 300-500 visits per day, but when there is a threat that volcanic emissions can spread to the northern islands this number jumps into the thousands per day. It has become apparent that visitors to the state also assess the state of air quality when planning their trips as evidenced by website hits from around the world, especially Japan, Canada, and Europe.

A recent meeting with Hawaii county stakeholders has given this project direction in order to reach a wider audience around the state. The aim is to improve the reliability of forecasts for poor air quality to be delivered to the Hawaii Department of Health. Steps are currently underway to achieve this. Once the forecasts are acceptable for Hawaii Department of Health they can confidently begin sending out air quality statements, alerts, watches, and warnings to the public through existing channels to improve public awareness. Without continued funding for VMAP this will be impossible to achieve.

In addition to the current duties performed by VMAP, the group is also capable of producing further products should events make them necessary. During the most recent lava flow that impacted Pahoa, the VMAP group produced a wildfire product to advise the public on the impact of burning vegetation and debris on air quality in the Pun and Hilo districts. The group has plans ready to produce forecasts should Mauna Loa or Hualalai become active.

The Vog Measurement and Prediction Project operated by the University of Hawaii at Manoa within the School of Ocean and Environmental Technology by the Department of Atmospheric Sciences provides a useful product to the state to protect public health and property. Should this project lose funding it will create a void that will quickly become apparent. Ongoing collaborations with stakeholders will serve to improve the products being delivered to minimize the impacts of natural hazards beyond our control.

UNIVERSITY OF HAWAIʻI SYSTEM
Legislative Testimony

Testimony Presented Before the
Senate Committee on Higher Education and the Arts
Tuesday, February 9, 2016 at 1:30 pm
by
Steven Businger, Chair, Atmospheric Sciences Department
and
Brian Taylor, Dean
School of Ocean and Earth, Science and Technology
University of Hawaiʻi at Mānoa

SB 2473 – RELATING TO AIR QUALITY

Chair Taniguchi and members of the Higher Education and the Arts committee:

The University of Hawaiʻi at Mānoa School of Ocean and Earth, Science and Technology (SOEST)) supports the intent of SB 2473 provided that its passage does not replace or adversely impact priorities as indicated in the University's Board of Regents Approved Executive Biennium Budget. This legislation appropriates funds for a dispersion-modeling center within SOEST in order to improve vog forecasts for the State.

Emissions of sulfur dioxide from Kīlauea, which has been degassing for over 30 years, are more than ten times greater than the dirtiest coal-fire power plant currently operating in the USA. The pollution plume represents a significant health hazard to the people of Hawaiʻi and it has been costly for Hawaiian agricultural interests. During vog episodes, hospitals report substantially increased numbers of patients suffering of respiratory ailments, that are consistent with a wide-range of respiratory symptoms linked to volcanic emissions. In addition, GPS and tilt meter data show that Mauna Loa is inflating and past eruption history suggests that Mauna Loa is overdue for an eruption.

Air quality forecasts for the State of Hawaiʻi are unavailable for volcanic emissions. To fill the void, scientists at the University at Hawaiʻi at Mānoa have been collaborating with stakeholders in Hawaiʻi to develop a custom dispersion model for volcanic emission in Hawaiʻi. The resulting Vog Model (short for volcanic smog) has been running operationally since 2010 over Hawaiʻi. Vog Model forecasts are run twice daily out to 60 hours in the future and are successful in simulating the extent of the plume and its downwind trajectory. For people in Hawaiʻi who suffer from allergies, emphysema, or asthma, having a vog model that forecasts the position of the plume, helps them to plan their activities to minimize their exposure. In addition the dispersion modeling center can play an important role in educating the public how best to mitigate the effects of vog.

SB 2473 provides funding support to SOEST to continue our efforts to provide and improve state-of-the-art dispersion modeling to Hawaiʻi stakeholders statewide that increases community resilience to volcanic emission hazards. The University of Hawaiʻi through SOEST is well positioned to carry this out and has demonstrated success through its Volcanic Measurement and Prediction program (see website link below).

Thank you for the opportunity to testify on this measure.

http://weather.hawaii.edu/vmap/index.cgi

FROM: James Foster, Director, Pacific GPS Facility

Hawaii Institute of Geophysics and Planetology

TO: Committee on Higher Education and the Arts

RE: **SB 2473** RELATING TO AIR QUALITY.

DATE: 8 February 2016

Senator Taniguchi and other distinguished committee members, I want to thank you for this opportunity to address SB-2473. I am an Associate Researcher at the University of Hawaii and Director of the Pacific GPS Facility, focusing on developing applications of GPS to understanding and mitigating natural hazards.

I urge you to pass this legislation. The issue of vog, and its impact on health and agriculture within the state, is of great importance. The long-running eruption of Kilauea volcano shows no signs of abating, so the need for timely and accurate forecasts of vog levels will remain for the foreseeable future. The likely eruption of Mauna Loa in the next few years will only add to this need. Sophisticated numerical models, run and interpreted by experienced personnel, are necessary to successfully carry out this type of forecasting. This capability exists within the School of Ocean and Earth Science and Technology at the University of Hawaii, and passing this legislation will ensure that this valuable contribution to the State's well-being and economy is established and can be maintained and further developed.

This effort is a perfect example of the synergies that emerge between research institutes and their host communities: researchers identify specific societal needs and acquire research support to develop solutions to these issues. Once developed, if they are judged to have sufficient benefit, revenue can be assigned to transform the research into operational products serving the community. I consider the proposed Dispersion Modeling Center to be excellent value for the benefits it will bring to the State.

Yours Sincerely,

U N I V E R S I T Y O F H A W A I ' I A T M Ā N O A
School of Ocean and Earth Science and Technology
Department of Atmospheric Sciences

February 8, 2016

To Whom it May Concern:

I am Dr. Jennifer Griswold an Assistant Professor of Atmospheric Sciences at the University of Hawaii at Mānoa. I primarily study clouds, but also study aerosols (pollution) similar and related to the types of emissions from the volcano called vog. I have no direct influence on the vog monitoring program and do not receive funding or support to investigate vog at the current time. Below I provide my testimony in support of the Bill SB 2473.

This testimony is in support of Bill SB 2473 that will allow the Vog Measurement and Prediction Project (VMAP) to continue in earnest and for the products to improve significantly with time. This program is of particular importance to the people of the State of Hawaii. VMAP provides vog forecasts that allow individuals, meteorologists (at the university and those associated with the media), health care providers, and emergency management personnel with information that is crucial to informing the public about vog intensity, timing, and potential effects to health. This is important because vog is primarily a mixture of sulfur dioxide (SO_2) gas and sulfate (SO_4) aerosol. SO_2 (invisible) reacts with oxygen and moisture in the air to produce SO_4 aerosol (visible). Both SO_2 gas and SO_4 aerosol can pose health threats, especially to sensitive populations (the elderly, young and even pets). The first stage of the project, funded by USGS's Hawaiian Volcano Observatory, provided proof that vog forecasting is both feasible and practical and provides significant information to health officials and emergency managers. With the continuous vent release of large volumes of SO_2 from the two vents at Kīlauea it is critical that forecasts continue and improve over time. There are many stakeholders associated with VMAP, all in support of improving air quality and forecasting of air pollution events. These stakeholders include the Hawai‘i State Civil Defense, Hawai‘i Department of Health, Clean Air Branch, the USGS Hawaiian Volcano Observatory, National Oceanic and Atmospheric Administration, and the National Park Service.

Continued funding is necessary to provide emergency management and health care professionals with information regarding the strength and intensity of vog events so they can adequately prepare for events and warn the population of Hawaii. In addition, continued funding will allow for the improvement of current products and for the project to expansion and provide additional desired or customizable products. We will all benefit from improvements in the accuracy of the volcanic gas modeling and forecast capability to predict the concentration and dispersion of sulfur-dioxide gas and aerosol particles emitted by the Kīlauea volcano based on state-of-the-art gas dispersion and numerical weather prediction (wind) models.

On a personal note, I suffer from extreme sensitivity to vog during the events. I am sensitive for sulfur (in food, medicine, and the air). Upon moving to Honolulu from Pasadena I had no idea what vog was and how it could affect my health. During my first winter here (2012-2013) there was a 7-day long intense vog event. I suffered severe pain in my sinuses and jaw and didn't know why. After visiting several doctors and a dentists they determined that my sinuses were severely inflamed and irritated from the vog. The SO_2 gas converts to sulfuric acid when in

2525 Correa Road, Honolulu, Hawai'i 96822-2219
Phone: (808) 956-3636, Fax: (808) 956-2877

U N I V E R S I T Y O F H A W A I ' I A T M Ā N O A
School of Ocean and Earth Science and Technology
Department of Atmospheric Sciences

contact with water, as in your moist nasal canal and sinuses. After chatting with the VMAP folks and using their forecast model provided freely to the public through http://weather.hawaii.edu/vmap/. I know when to wear a face mask and when to limit my time outdoors. Since that first vog episode I have used the VMAP products to prevent another serious vog related health issue. This story is obviously anecdotal, but it serves a purpose in that other individuals with sulfur sensitivities, the elderly and the young, as well as pets benefit from the forecasts and predictions provided by VMAP. I strongly support SB2473 and the continuation of VMAPs funding. The benefits to the population of Hawaii are numerous and should not be ignored.

Sincerely,

Dr. Jennifer Griswold

Assistant Professor
Department of Atmospheric Sciences
University of Hawaii at Mānoa

2525 Correa Road, Honolulu, Hawai'i 96822-2219
Phone: (808) 956-3636, Fax: (808) 956-2877

From: mailinglist@capitol.hawaii.gov
To: HEA Testimony
Cc: claire.horwell@durham.ac.uk
Subject: Submitted testimony for SB2473 on Feb 9, 2016 13:30PM
Date: Monday, February 08, 2016 12:32:50 PM

SB2473
Submitted on: 2/8/2016
Testimony for HEA on Feb 9, 2016 13:30PM in Conference Room 224

Submitted By	Organization	Testifier Position	Present at Hearing
Claire Horwell	International Volcanic Health Hazard Network	Support	No

Comments: My name is Dr Claire Horwell, Senior Lecturer at Durham University, UK. I am Director of the International Volcanic Health Hazard Network (www.ivhhn.org) the global umbrella organization for dissemination of public information on volcanic health issues. I do not know if my testimony is allowed or not but I hope you can consider it. I recently conducted a study on Hawaii on how communities protect themselves from vog. This culminated in a multi-agency workshop (including HDOH, Civil Defense, USGS, NPS, HCVB and UH Manoa VMAP team) held at UH Hilo on January 28 2016 (last week) which worked on how agencies offering advice and alerts relating to vog should provide consistent advice that is relevant to the communities and how to action those plans. This involved discussion on how it is impossible to offer alerts and warnings without accurate forecasting. Currently the VMAP project is the only model to offer this and its future is critical to HDOH's ability to provide timely information to the Hawaii communities. HDOH does not currently provide information through NOAA or any other alerting route and it is critical that VMAP is funded so that it can be developed and maintained with the aim of providing accurate forecasts for HDOH. VMAP has enormous potential to develop; an App has already been mooted and prototypes developed which would provide an easy way to disseminate alerts and forecasts but also a way for data validation through 'citizen science' (individuals reporting vog in their area). I strongly support the mandated funding of VMAP and I hope that this testimony can be used along with more formal ones.

From: mailinglist@capitol.hawaii.gov
To: HEA Testimony
Cc: Kim.Nguyen@lung.org
Subject: *Submitted testimony for SB2473 on Feb 9, 2016 13:30PM*
Date: Tuesday, February 09, 2016 9:01:15 AM

SB2473
Submitted on: 2/9/2016
Testimony for HEA on Feb 9, 2016 13:30PM in Conference Room 224

Submitted By	Organization	Testifier Position	Present at Hearing
Kim Nguyen	American Lung Association in Hawaii	Support	No

Comments:

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From: mailinglist@capitol.hawaii.gov
To: HEA Testimony
Cc: rick@weatherguy.com
Subject: Submitted testimony for SB2473 on Feb 9, 2016 13:30PM
Date: Monday, February 08, 2016 9:52:10 AM

SB2473
Submitted on: 2/8/2016
Testimony for HEA on Feb 9, 2016 13:30PM in Conference Room 224

Submitted By	Organization	Testifier Position	Present at Hearing
Richard Shema	Weatherguy.com	Support	No

Comments: Dear Sir/Madam: This testimony is in strong support of SB 2473, funding for vog model and prediction. I understand that the vog model may be terminated for lack of funding. During any season in Hawaii when southeast winds are present, vog represents a tangible health hazard on Oahu, especially for those of us who are sensitive to vog. During vog episodes, every breath can cause distress. For folks who suffer from allergies, emphysema, or asthma, vog is a serious health risk. I personally know friends having respiratory illness. Having a vog model that forecasts the position of the plume, greatly helps them plan activities to minimize exposure and reduce health risks. Your support of SB 2473 is critical to the health and wellbeing of many Hawaii residents. Thank you and Aloha! Rick Shema

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My name is Barbara Di Ferrante. My husband and I own a home in Kihei and are part-time residents of Maui. I write to urge your support for SB2473 and funding for the continuation and improvement of State's VMAP web pages.

Two years ago, I spent a year struggling with a severe asthmatic crisis brought on by overexposure to vog. Once recovered, I turned to VMAP in order to avoid a recurrence. The University of Hawaii's vog modeling and predicting is an essential tool for asthmatic sufferers, like myself, with doctors' orders to avoid strenuous outdoor activity and prolonged exposure to the vog and its elements. Using the site, I can determine if I may have an active outdoor day or if I should remain indoors in the air conditioning.

The vog is a health issue for both Maui residents and visitors. Clearly, no legislature can "fix" the vog or the effect it has on Hawaii's reputation as a paradise. However, it is within the legislature's power to support a viable and accurate vog prediction model, and I urge you to do so.

From: mailinglist@capitol.hawaii.gov
To: HEA Testimony
Cc: brutledge@sandiegozoo.org
Subject: Submitted testimony for SB2473 on Feb 9, 2016 13:30PM
Date: Monday, February 08, 2016 5:39:00 AM

SB2473
Submitted on: 2/8/2016
Testimony for HEA on Feb 9, 2016 13:30PM in Conference Room 224

Submitted By	Organization	Testifier Position	Present at Hearing
Barry Rutledge	Individual	Support	No

Comments: We have staff located in Volcano HI. I use the Vog monitoring web site to keep track of my employees exposure to help ensure their health and safety. This site allows me the ability to monitor this exposure from my office in San Diego, CA. It is very valuable information that I could not other wise receive.

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From: mailinglist@capitol.hawaii.gov
To: HEA Testimony
Cc: biltoftc@yahoo.com
Subject: Submitted testimony for SB2473 on Feb 9, 2016 13:30PM
Date: Monday, February 08, 2016 11:49:38 AM

SB2473
Submitted on: 2/8/2016
Testimony for HEA on Feb 9, 2016 13:30PM in Conference Room 224

Submitted By	Organization	Testifier Position	Present at Hearing
Christopher Biltoft	Individual	Support	No

Comments: I am commenting in support of SB2473, which would continue funding for VMAP modeling of VOG dispersion. VMAP is an appropriate model for tracking the dispersion of VOG across Hawaii. An effective VOG monitoring program requires both in-situ measurements and modeling. It is crucial to the health and safety of Hawaii residents and guests that the State of Hawaii maintain an effective VOG monitoring program so long and Kilauea continues to erupt. I urge the Legislature to recognize this need and support SB2473.

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SB2473 Testimony

Aloha

I find the VOG model very helpful.... It gives me a heads up on how much allergy med's I need to take.

It would be nice if you could add one more concentration level to the time loop, half way between zero and good (green).

FYI: When that good green air hits Kauai, many people are seriously affected....

-don

Donald Greer

POB 583, Lihue, HI 96766

don@kauaichocolate.us

Division of Health Sciences
University of Nevada, Reno

February 9, 2016

To: Committee on Higher Education and the Arts
Chair - Senator Brian T. Taniguchi

SB 2473 – Relating to Air Quality

Long-term residency in Vog areas may adversely influence health, especially in vulnerable population groups most susceptible to air pollution (i.e. asthmatics, children and those with chronic disease). The effusive eruption of lava and gases continues at Kīlauea Volcano exposing residents to sulfurous air pollution at concentrations above World Health Organization recommendations and the U.S. Environmental Protection Agency's sulfur dioxide National 1-hour Standard.

It is imperative that Hawai`i's residents and health care clinicians across the state have the opportunity to be informed of evidence-based Vog forecasting and warnings. The existing Vog model operated by the School of Ocean and Earth Science and Technology at the University of Hawaii Manoa provides this unique science-based service to the citizens of Hawai`i. Along with information provided to the public from the Clean Air Branch of the DOH, the Vog model can allow individuals with respiratory or heart problems to take the necessary protective actions during high Vog events.

As a nurse scientist studying Vog, and the state's Clean Air Ambassador to Hawai`i from the American Nurses Association, I support S.B. NO 2473. I urge you to take action to provide the tools for the residents of Hawai`i and visitors to the state to make informed decisions about their health and welfare.

Thank you very much for this opportunity to testify.

Dr. Bernadette Mae Longo, Ph.D., RN
Associate Professor
Advanced Public Health Nurse-Board Certified
Clean Air Ambassador – Hawaii & Nevada – *The American Nurses Association*

Orvis School of Nursing
Pennington Health Sciences Building
1664 N Virginia Street
University of Nevada, Reno/0134
Reno, Nevada 89557-0134
(775) 784-6841 office
(775) 784-4262 fax
www.unr.edu/nursing

SB-2939 -RELATING TO AIR QUALITY

Testimony From Ginger Soares, Wailuku, Maui

Please continue funding this program.

I have 10 year old twins with asthma. VMAP is the only resource I know of and I rely upon to keep track of voggy skies. I need to protect my children and family from Voggy condition for health related reasons. Without VMAP, I would lose vital information I need to determine what days and times to keep my children indoors.

Taking time off of from work to care for my ill children has a huge financial burdon on my family. This can be avoided with the help of VMAP technology. Please, please, please keep this program funded.

From: mailinglist@capitol.hawaii.gov
To: HEA Testimony
Cc: khorton@hawaii.rr.com
Subject: Submitted testimony for SB2473 on Feb 9, 2016 13:30PM
Date: Sunday, February 07, 2016 1:33:17 PM

SB2473
Submitted on: 2/7/2016
Testimony for HEA on Feb 9, 2016 13:30PM in Conference Room 224

Submitted By	Organization	Testifier Position	Present at Hearing
Keith Horton	Individual	Support	No

Comments: Having been involved with the science and techniques of measuring sulfur dioxide emissions from volcanoes and anthropogenic sources for over a decade, it is striking how much many of the public depend on the information available from the Vog Measurement and Prediction project. VMAP has been a great first step in addressing this chronic and occasionally acute environmental problem. I applaud SOEST in maintaining the modeling efforts and the Hawaiian Volcano Observatory for maintaining the measurement component, the FLYSPEC array. For the benefit of all of Hawaii, these efforts should be supported into the future.

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From: mailinglist@capitol.hawaii.gov
To: HEA Testimony
Cc: punalikeke3@msn.com
Subject: Submitted testimony for SB2473 on Feb 9, 2016 13:30PM
Date: Monday, February 08, 2016 12:03:01 PM

SB2473
Submitted on: 2/8/2016
Testimony for HEA on Feb 9, 2016 13:30PM in Conference Room 224

Submitted By	Organization	Testifier Position	Present at Hearing
Laura Lee Wolf	Individual	Support	No

Comments: With the new and growing numbers of asthmatics in the state these VOG/Haze models and forecasts are important to public health. They are a resource assisting individuals in being proactive about their health. Matters not which island you reside on, Vog/haze affects us all and impacts health care costs.

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From: mailinglist@capitol.hawaii.gov
To: HEA Testimony
Cc: Marymalone2@aol.com
Subject: Submitted testimony for SB2473 on Feb 9, 2016 13:30PM
Date: Monday, February 08, 2016 11:39:23 AM

SB2473
Submitted on: 2/8/2016
Testimony for HEA on Feb 9, 2016 13:30PM in Conference Room 224

Submitted By	Organization	Testifier Position	Present at Hearing
Mary Malone	Individual	Support	No

Comments: Dear Legislators: As one of your constituents who suffers from chronic respiratory problems, I beseech you to at least maintain or preferably increase, funding for the UH Vog model. I depend on the information the Vog Model provides everyday! It is, by far, the best source of information regarding our vog/air quality. There are some days when I simply cannot go outside. In order to plan my daily activities and work, I need the vog model. Please maintain their funding and extremely important service that it provides. If I could testify in person I would, but I live on Maui. Thank you for your thoughtful consideration. I will remember your actions on election day, as will my large group of socially conscious friends. Feel free to contact me if I may provide further information. Very truly yours, Mary Malone Attorney at Law

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From: mailinglist@capitol.hawaii.gov
To: HEA Testimony
Cc: mattbinder@earthlink.net
Subject: Submitted testimony for SB2473 on Feb 9, 2016 13:30PM
Date: Monday, February 08, 2016 9:27:12 AM

SB2473
Submitted on: 2/8/2016
Testimony for HEA on Feb 9, 2016 13:30PM in Conference Room 224

Submitted By	Organization	Testifier Position	Present at Hearing
Matt Binder	Individual	Support	No

Comments: Please fully fund the VMAP web pages and fog model forecasts. These are very important health resources that cost very little. Thank you, Matt Binder. Kamuela

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From: mailinglist@capitol.hawaii.gov
To: HEA Testimony
Cc: pfrier@aloha.net
Subject: Submitted testimony for SB2473 on Feb 9, 2016 13:30PM
Date: Monday, February 08, 2016 4:30:12 PM

SB2473
Submitted on: 2/8/2016
Testimony for HEA on Feb 9, 2016 13:30PM in Conference Room 224

Submitted By	Organization	Testifier Position	Present at Hearing
Pamela Frierson	Individual	Support	No

Comments: I have developed high vog sensitivity since I moved to Volcano in 1988. For the last several years I have lived on the Hamakua Coast, but still am nearly incapacitated by the vog when it is bad. If it is likely to last several days, I go to Oahu to escape the worst of it; if it may be voggy only for a few days I try to tough it out with the help of an AC and an IQ Air purifier. The vog prediction has been essential to planning how to make it through voggy periods. I have found it predicts with surprising accuracy.

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From: mailinglist@capitol.hawaii.gov
To: HEA Testimony
Cc: rcjmd2000@yahoo.com
Subject: Submitted testimony for SB2473 on Feb 9, 2016 13:30PM
Date: Monday, February 08, 2016 7:34:33 AM

SB2473
Submitted on: 2/8/2016
Testimony for HEA on Feb 9, 2016 13:30PM in Conference Room 224

Submitted By	Organization	Testifier Position	Present at Hearing
Robert Johnson, MD	Individual	Comments Only	No

Comments: As a family practice physician in Pahoa, HI which is near the Kilauea Volcano, I use the vog prediction model to help me understand how vog may be affecting asthma and respiratory infections and irritations in my patients. As a resident of Pahoa it is also helpful in understanding my own symptoms. I respectfully request that you fund this program. Thanks.

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Dear State Legislature,

My name is Roy Huff, and during the period from December 2009 through December 2011, I worked for RCUH as the lead Vog Modeler on the VMAP project. After the project lost funding, I continued working on research conducting during the life of the project to assist both the National Weather Service and the University of Hawaii in improving an operational model that could predict the location and concentration of air pollutants resulting from emissions from the Kilauea Volcano.

This past October 2015, I co-authored a paper based on the same research that was chosen for the cover of the Bulletin of the American Meteorological Society (BAMS), and I have continued to do public outreach on local news media, as well as national forums in San Francisco other locations.

During the project, I was able to develop a powerful operational model that has since been viewed by hundreds of thousands people. This tool is currently being improved upon and serviced by the University of Hawaii under the supervision of Dr. Steven Businger through volunteers in the department. It has proved extremely valuable to forecasters for people who live in the region. This has impacted decision making by farmers, residents, tourists, and others. It has the potential to mitigate health risks and reduced damage through advanced preparation. It also provides information that can be used for planning on zoning commissions for residential and urban planning.

Unfortunately, significant improvements to the model, such as more accurate concentration amounts and plume position, require more time and computer power then can be provided through volunteer work. Advancements in modeling and computing have provided an opportunity to greatly enhance the accuracy of the model, and in turn, provide even greater foresight on potential hazards associated with VOG.

Numerous state and local participants, such as the Hawaii State Department of Health, USGS, and HVO have made contributions and would benefit from improvements in the model. Additional funding would allow potential improvements to be used by those organizations to supplement and strengthen existing public information and health campaigns for residents of Hawaii. This has the potential to impact upwards of one million people in the islands, and provides an opportunity for a proactive effort in the face of increasing and uncertain changes in the emissions from Kilauea. The financial impact alone of improved forecasting can easily save the state and residents tens of millions of dollars from greater awareness of immediate health hazards and more informed zoning in agricultural and residential areas.

Without the funding providing by the proposal being discussed here, the state and all participants would miss out on an opportunity to provide tremendous health and financial benefits to a large percentage of residents. It would miss out on the opportunity to plan and maintain important agricultural and residential interests in the islands, and it would miss out on an opportunity for the state to assist in a highly impactful health and safety issue at a comparatively miniscule cost.

For the aforementioned reasons, it is my hope that you will give serious consideration to the passage of Bill SB 2473 for the health, safety, financial, and cultural well being of the state and its residents.

Sincerely,

Roy Huff, MS, MAEd

To: Committee on Higher Education and the Arts Feb 8, 2016

This is testimony in support of SB 2473, which will appropriate funds for a dispersion modeling center within the school of ocean and earth science and technology at the University of Hawaii at Manoa in order to improve vog forecasts for the State.

As a citizen of Hawai`i Island for the past 30 years, I have observed and experienced the health and environmental impacts from vog from both the East Rift eruption of Kilauea, which began in 1983, and the summit eruption which began in 2008. These eruptions have created repeated exceedences of National Ambient Air Quality Standards for communities on Hawaii Island due to the gas and particle emissions from the Kilauea eruptions. If this pollution source were man-made, the regulatory agencies would be able to help the citizens reduce their exposure to harmful gases and particles by reducing the emissions from the source. Since this is not possible for this natural source, a reliable and accurate vog forecast model provides a way to alert citizens to potentially hazardous levels of pollution, and helps them adapt to living with this constant source of pollution.

The U.S. Department of Agriculture provided Federal disaster assistance to farmers and ranchers from 2008-2011, and ongoing subsidy programs are helping them deal with vog damage to crops and ranching infrastructure. Ambient air quality standards for SO2 were exceeded in Pahala more than 200 days in 2015 (EPA allows on average ~ 4 days/year before an area is in "violation" of the standard). These examples show that vog is a continuing issue on the island. During wind reversals, the entire state can be impacted by vog.

Providing a vog forecast model takes advantage of the technological capabilities available to us in 2016, that did not exist in the 1980's. Forecasts are an integral method for dealing with natural hazards – high surf advisories, tsunami warnings, hurricane and flood advisories are all necessary to keep island citizens and visitors safe. Since everyone has to breath, and many people find vog impacts their health and sense of well-being, knowing when vog is forecast to be in an area is a fundamental tool for helping people keep themselves safe. VMAP can help build a resilient, informed population, and brings the state into the modern era with respect to living with an active degassing volcano. Other areas living with persistently degassing volcanoes (i.e. Iceland) have quickly put together forecast models to help their citizens protect themselves (http://brunnur.vedur.is/kort/calpuff/2014/11/05/00/calpuff_island_so2.html#).

I hope that the useful VMAP tool can receive the support it needs to continue and grow.

Respectfully,

Tamar Elias

POB 901

Volcano, HI 96785

808-967-8086

From: mailinglist@capitol.hawaii.gov
To: HEA Testimony
Cc: titusblair@gmail.com
Subject: Submitted testimony for SB2473 on Feb 9, 2016 13:30PM
Date: Monday, February 08, 2016 2:41:06 PM

SB2473
Submitted on: 2/8/2016
Testimony for HEA on Feb 9, 2016 13:30PM in Conference Room 224

Submitted By	Organization	Testifier Position	Present at Hearing
Titus Blair	Individual	Comments Only	No

Comments: The VOG modeling service is vital to proper respiratory health for all those living in Hawaii. It has helped my family tremendously to insure we are not being exposed to dangerous volcanic toxins and is an asset to everyone! Please continue funding!

Please note that testimony submitted less than 24 hours prior to the hearing, improperly identified, or directed to the incorrect office, may not be posted online or distributed to the committee prior to the convening of the public hearing.

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Dr. Tiziana Cherubini, Ph.D.
University of Hawaii,
Research Corporation of the University of Hawaii.
Department of Meteorology
2525 Correa Road, Honolulu. Hawaii 96822
(808) 956-4593, FAX (808) 956 2877
email: tiziana@hawaii.edu

8 February 2016

Subject: Testimony in Support of "Vog Modeling and prediction in Hawaii". Bill SB2473.

Your Honor:

My name is Tiziana Cherubini. I work with the Research Corporation of the University of Hawaii as a research meteorologist in support of the astronomy community on Mauna Kea (http://mkwc.ifa.hawaii.edu).

I live and work in Honolulu since the end of 2001 and I am the mother of two kids of 5 and 10 years old. Throughout the years I lived in Honolulu I could appreciate the mostly clean and sweet Hawaiian air. Nevertheless I also came to know VOG and its related issues.

As a private citizen I greatly appreciate the VOG model products available through the http://weather.hawaii.edu web site. I do like the possibility to anticipate a VOG event, particularly in relation to my younger son's health, as he seems to be an allergy-prone subject.

Although working in a different area, as a meteorologist I greatly appreciate this cutting edge tool and I strongly support the research behind it.

In my opinion, the "VOG modeling and prediction in Hawaii" project is very important for the Hawaiian community.

Sincerely,

Tiziana Cherubini