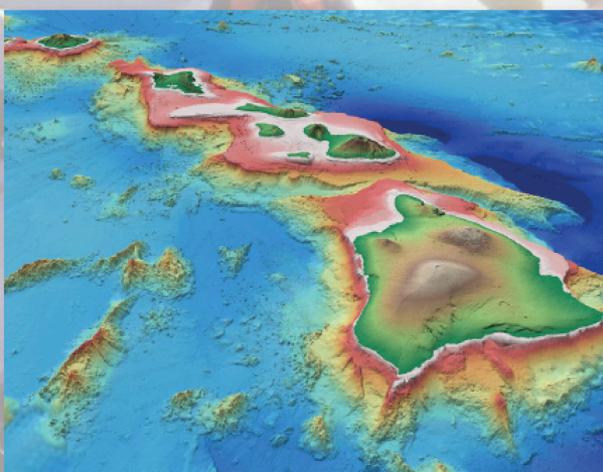
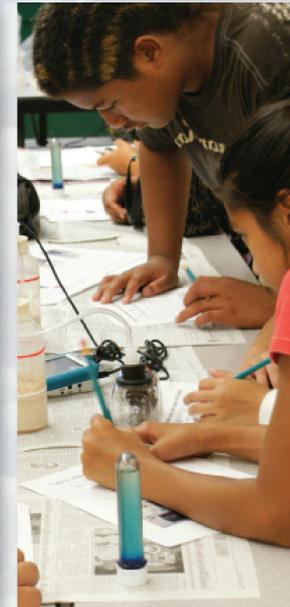


# SOEST

providing science, technology and education to advance understanding of the ocean, Earth and planets ...

Dean's meeting with SOEST faculty 5/9/18



## ... and

- solve energy and resource issues
- forecast our changing climate
- build and launch small satellites
- provide beach safety and vog alerts
- employ and train a high-tech workforce
- track sea level rise and coastal erosion
- preserve fisheries and coral reefs
- determine impacts of ocean acidification



# Hokulea: Malama Honua



**2017 VOYAGING *into* HISTORY**

Hawaiian Airlines celebrates the voyaging spirit of the great Pacific wayfinders who came before us – a spirit shared today by the Polynesian Voyaging Society and the Malama Honua Worldwide Voyage of the Hōkūle‘a.

**Ipu** – Gourd containers for storing food or water during voyages.

**Lei Hulu** – Feather lei flown from the tip of the canoe boom to help identify wind direction.

**Ceremonial Adze** – The adze is a tool traditionally employed for hulling out canoes; this example was intended for ceremonial rather than practical use.

**Hōkūle‘a** is a traditional Polynesian voyaging canoe sailing around the world with a message of environmental sustainability.

**Canoe Design** – The design of voyaging canoes varied from island to island, with differences especially notable in the number and type of sails.

**Canoe Model** – Constructed by crew members, including famed navigator Mau Piailug, during one of the Society's first voyages to Tahiti in the 1970s.

**Tanoa** – Bowl used in the preparation and serving of ava for departure and arrival ceremonies.

**Tongariro** – Carved 50 years ago in New Zealand, this ki'i represents ancestors and is believed to offer spiritual protection over the canoe.

**Star Compass** – A mental construct for navigation that includes the houses of the stars, flight paths of birds and direction of the waves.

**Pohaku** – Following the custom of bringing a piece of home with you, the Society's voyagers chose a stone from the beach where Hōkūle‘a was first launched.



R/V FALKOR 1/5/18

PacIOOS 10 years



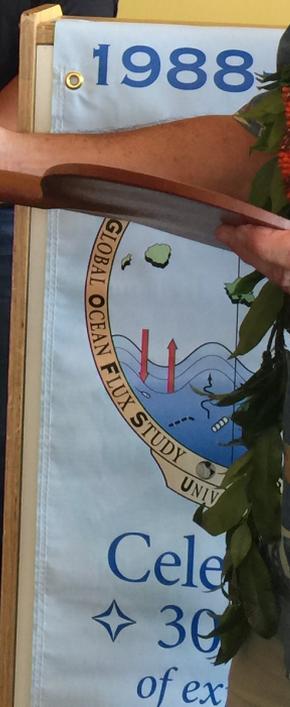
# 2017 SOEST Open House



# FKD Memorial Poker Tournament

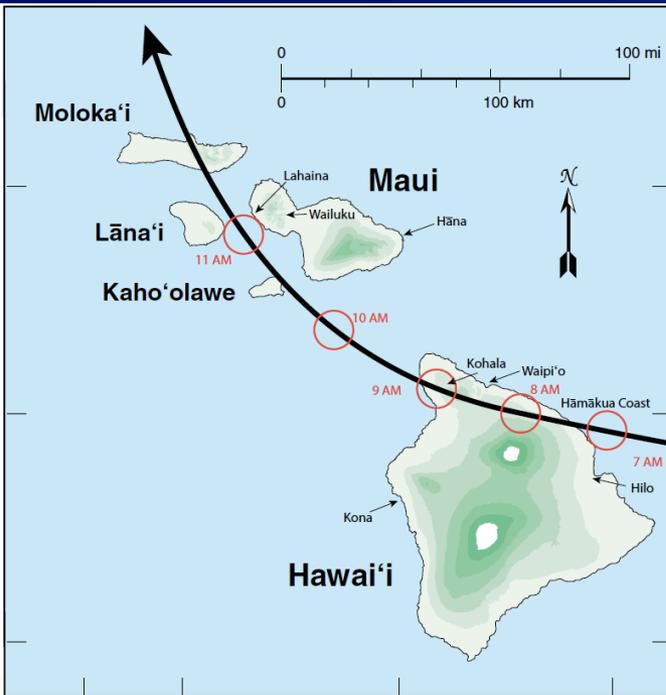


HOT 300



# Institute for Hawaiian Language Research and Translation

led by Puukea Nogelmeier  
(Sea Grant & Hawaiiinuiakea)



## Hawaiian-language newspapers illuminate a 1871 hurricane

Businger, Nogelmeier, Chinn & Shroeder, AMS 2018

### No ka Ino ma Maui.

Ma na lono hope mai nei mai Maui mai, ua ikaika loa ka makani malaila i ka Poakolu a me ka Poaha o kela pule mai nei; a pela me ka ua. Eia malalo ibo nei kekahi mea o hoike ana no ka poino i loa malaila mai kekahi kanaka mai o Maui:—

“Kakahika Poaha—Ua hoomaka mai ka ua lili ana ma kakahika onehine, me ka ukali pu ia e ua kikiro mekau mai ka Akau a me ka Hikina Akau mai; e hiki i ke awa-koa, oia iho la ka wa i ikaika loa ai ka makani, a ulupa ia iho la ua ulu, niu a me na lau e se a pou, a muu iho la i ke alanui. Ia like ka ikaika o ka ki ana o ka makani, me he mau ooo mahu la 5,000 i hookuuia i ka wa hookahi. Ua hoomaka hoi ka ua mai kakahika a po. I ka bora 11, ua holomoku nei mai la ka wai a halana pu ia na aina haeha, e lawe ana i na mea a pau i loa aku ma ko lakou alanui hele. Ua nui loa ke poino o na lau kua, a me na komu waina. Ma keia kakahika Poaha, ua kanahoi mai ka makani, me he mea la e pa puhiti ana mai ka Akau a i ka Hikina Hema, a lai pu iho la

“It started lightly raining from yesterday morning, followed by the gusting winds from the North and Northeast; until the early afternoon, when the wind became really strong, and all of the breadfruits, coconuts, and other plants were destroyed, broken in the roadway. The streaming of the wind was similar to 5000 steam whistles set off at one time. The rain continued from morning till night. At 11 'o clock, the waters rushed swiftly and the lowlands were flooded, sweeping everything that was in their paths. The damages were great concerning the koa trees and the grapevines. On Thursday, the wind lessened, and it seemed to be veering from the North towards the Southeast and it calmed down by 5 o'clock in the evening.”

Ke Au Okoa published on 24 Aug 1871, with English translation.

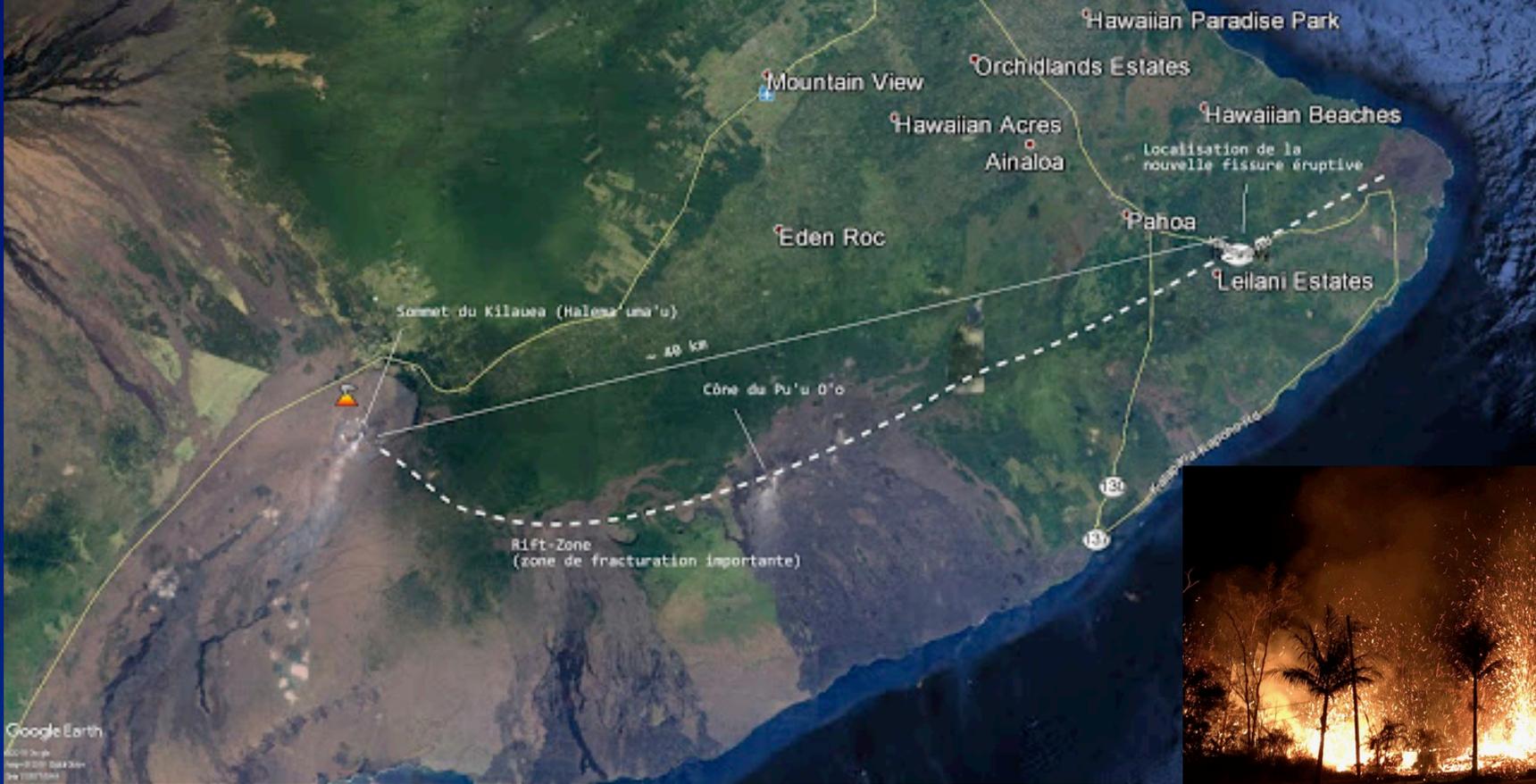
LIVE

7.5k

JEREMIAH OSUNA

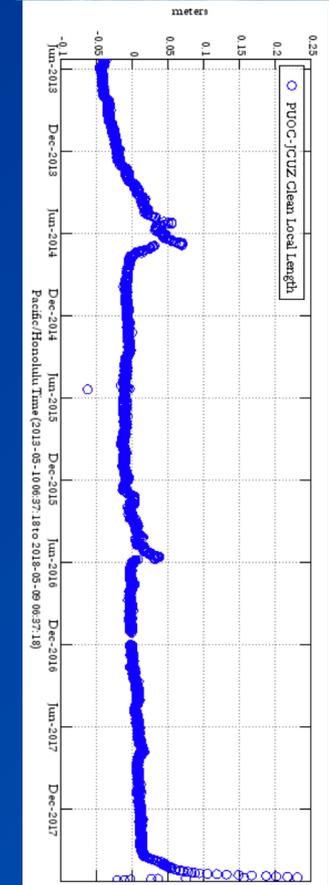
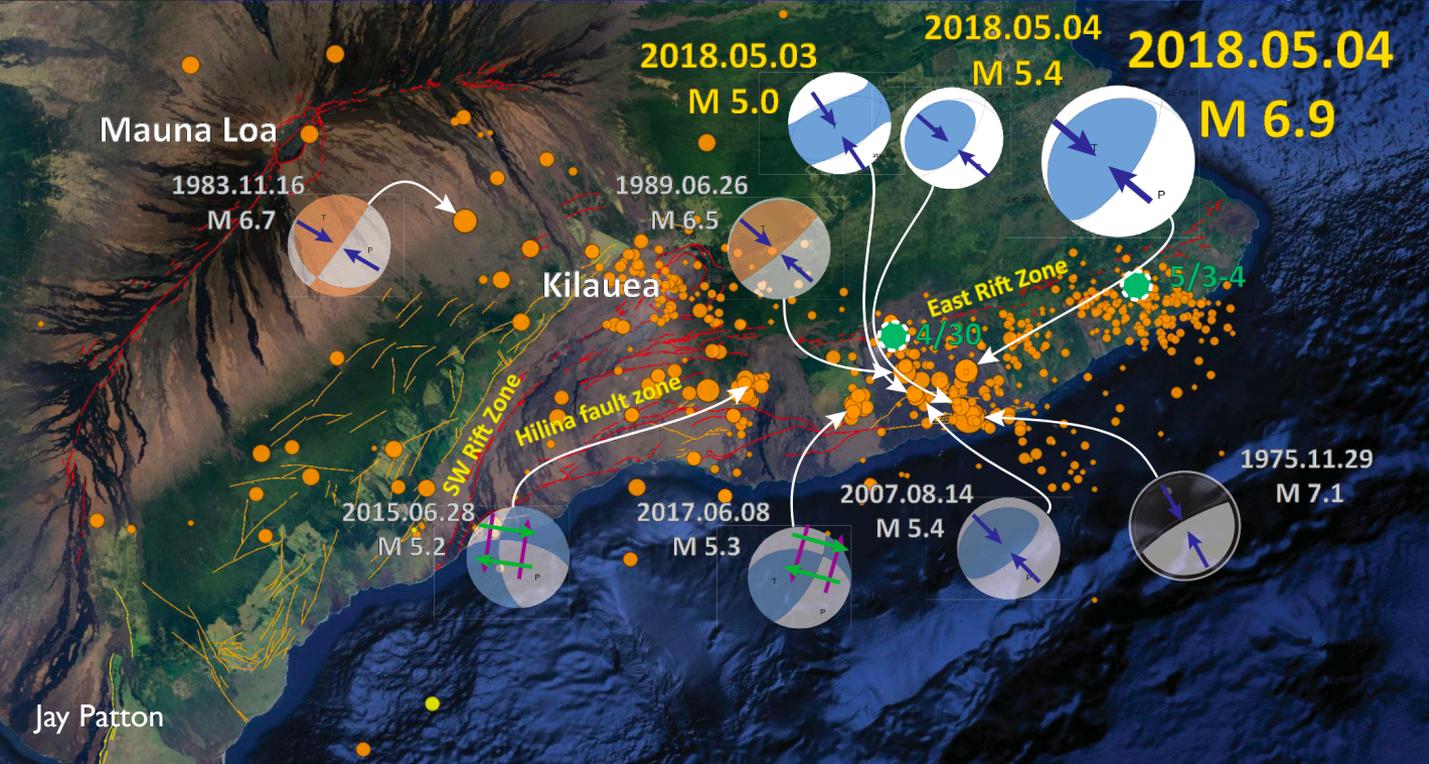
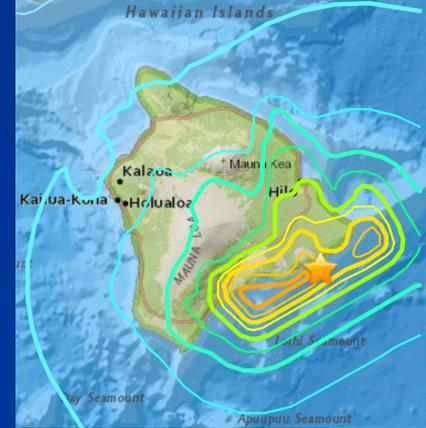
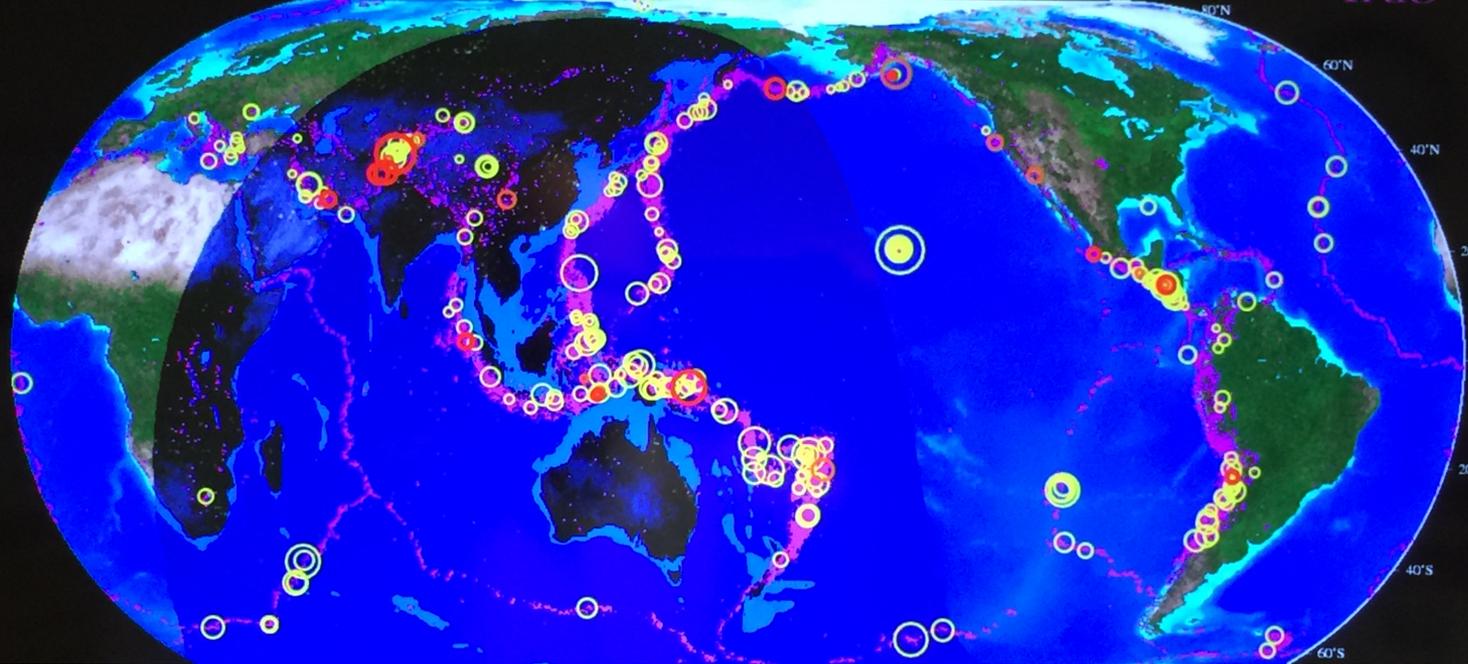


**BREAKING NEWS**  
**RESIDENTS EVACUATING FROM LEILANI ESTATES**  
ABOUT 10,000 RESIDENTS LIVE IN AREA



Google Earth  
©2019 Google  
Imagery ©2019 Earth Star  
Data ©2019 Google





GPS distance across Pu'u O'o past 5 years

# New SOEST TT Faculty



Matthieu Dubarry  
HNEI Aug. 17

Nicolas Gaillard  
HNEI Aug. 17



Kiana Frank  
PBRC Sept. 17

Niels Grobbe  
HIGP/WRRC Nov. 17



Lars Bejder  
HIMB Jan. 18

Chris Sabine  
OCE Jan. 18



Phil Thompson  
OCE Feb. 18

Josh & Liz Madin  
HIMB May 18



Tom Shea  
G&G July 18

Angelique White  
OCE July 18



Justin Stopa  
ORE Aug. 18



Nicole Hynson  
PBRC Aug. 18

Giuseppe Torri  
ATM Aug. 18



Steve Karl, RIP



Flo Thomas

Dixie Blanchard

Eric DeCarlo

Frank Sansone



Jay Griffin => PUC

Jennie Potter => PUC



Janet Becker => Scripps

Mark Merrifield => Scripps

Olivier Rouxel => IFREMER



# SOEST Faculty Recognition



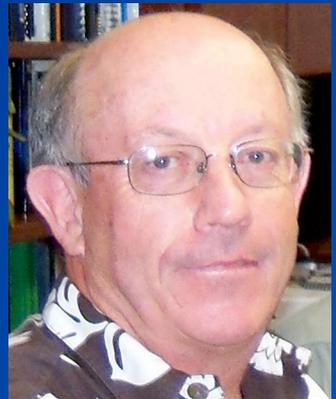
Bo Qiu April 2018  
BOR Excellence in Research Award



Murli Manghnani Dec. 2017  
AGU Fellow



Margaret McFall-Ngai Dec. 2017  
Howard Hughes Medical Inst. Professor



Bruce Houghton Aug. 2017  
IAVCEI Thorarinsson Medal



Sebastien Biass Aug. 2017  
IAVCEI George Walker Medal

# SOEST Faculty Recognition

**Don Thomas** Feb. 2018

Western States Seismic Policy Council  
Lifetime Achievement Award



**Nicole Lautze** Nov. 2017  
Clean Energy Education &  
Empowerment Award



**Sasha Krot** June 2017  
Humboldt Research Award



**Sonya Rowling** Nov. 2016  
Sir David Attenborough Award



# 2018 Promotion & Tenure

all positive recommendations



ATMO: Jennifer Griswold I4

OCE: Anna Neuheimer I4  
Michael Guidry S4  
Brian Powell I5



HIMB: Megan Donahue R5  
Carl Meyer R4  
Judy Lemus S5



SeaGr: Ruby Pap A4



## New EXCOM Members

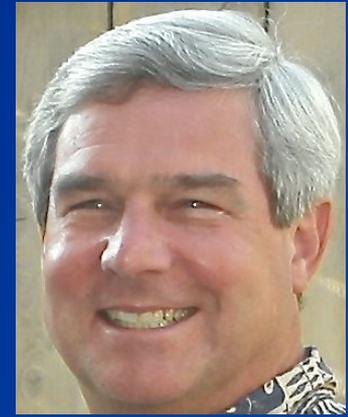
Niklas Schneider OCE July 17

Doug Luther JIMAR Sept. 17

Rob Wright iHIGP Sept. 17

Anita Lopez DRVO Feb 18

Paul Wessel G&G July 18



Recommended Department name  
change: G&G => Earth Sciences

**Bob Richmond (PBRC)** appointed to NAS committee to explore interventions to save coral reefs



Healthy reefs in 2014 (left) had lost their colour in 2015 (right)



**Chip Fletcher,**  
**Rosie Alegado**  
**Makena Coffman**  
appointed to HNL  
Climate Change  
Commission

# Hawai'i Climate Change Mitigation & Adaptation Commission: SLR Report



Sea Grant  
King Tides Project

# Most atolls will be uninhabitable by the mid-21st century because of sea-level rise exacerbating wave-driven flooding

25 April 2018 Sci.Adv.

Curt D. Storlazzi,<sup>1\*</sup> Stephen B. Gingerich,<sup>2</sup> Ap van Dongeren,<sup>3</sup> Olivia M. Cheriton,<sup>1</sup> Peter W. Swarzenski,<sup>4</sup> Ellen Quataert,<sup>3</sup> Clifford I. Voss,<sup>5</sup> Donald W. Field,<sup>6</sup> Hariharasubramanian Annamalai,<sup>7</sup> Greg A. Piniak,<sup>6</sup> Robert McCall<sup>3</sup>



# Characterization and engineering of a plastic-degrading aromatic polyesterase

Austin et al.  
2018 PNAS

A newly discovered bacterium secretes an enzyme that digests plastic (PET). Austin further engineered this enzyme for improved PET biodegradation. (synthetic biology)

150  
GtCO<sub>2</sub>\*  
equivalent

# PLOTTING THE FUTURE

NATURE | VOL 556 | 26 APRIL 2018

Greenhouse-gas emissions could take many paths in the coming years, resulting in differing levels of warming relative to pre-industrial levels. Thanks to policies that have already been implemented by governments around the world, temperatures are not expected to rise as high by 2100 as they otherwise would. But to achieve the 1.5 °C and 2 °C targets set by the 2015 Paris climate accord, more-aggressive emissions reductions will be needed.

100 —

50 —

0

1990      2000      2020      2040      2060      2080

**NO CLIMATE POLICIES**  
4.1 – 4.8 °C

**CURRENT CLIMATE POLICIES**  
3.1 – 3.7 °C

**PLEDGES**  
2.6 – 3.2 °C

Projections

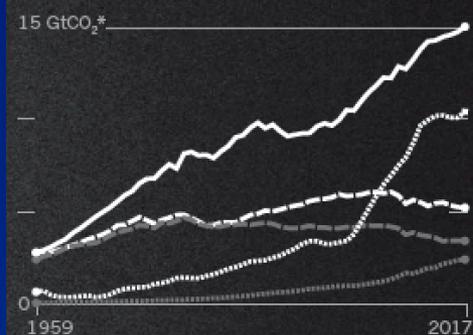
2 °C PATHWAYS

1.5 °C PATHWAYS

## THE BIG CONTRIBUTORS

A fairly small number of countries are responsible for the bulk of CO<sub>2</sub> released annually. But emissions from the rest of the world are on the rise.

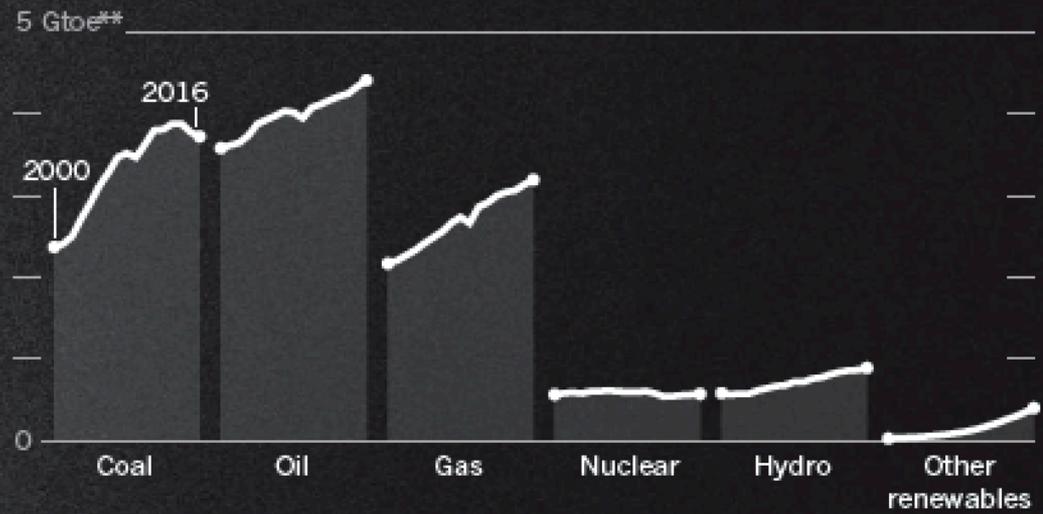
— India    — European Union  
— United States    — China    — All others



## THE SCALE OF THINGS

Global energy consumption is still dominated by fossil fuels. A small fluctuation in coal use from one year to the next can wipe out a seemingly dramatic expansion in renewable energy.

\* Gigatonnes of carbon dioxide  
\*\* Gigatonnes oil equivalent



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GtCO<sub>2</sub>\*  
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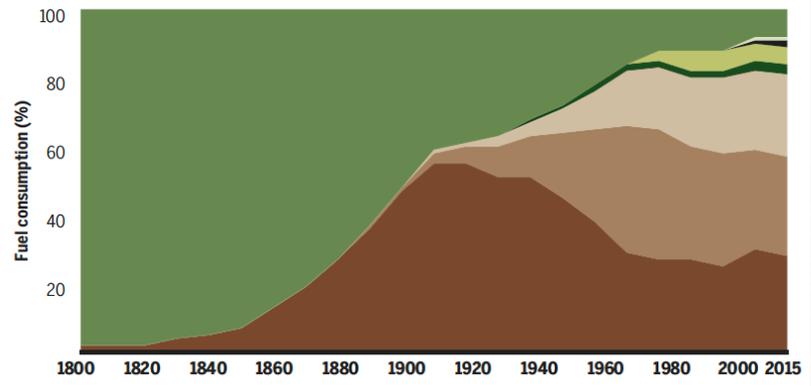
1.5 °C PATHWAYS

2 °C PATHWAYS

NATURE | VOL 556 | 26 APRIL 2018

The pace of past energy transitions suggests that a full-scale shift to renewables will be slow.

● Wind and solar electricity ● Hydroelectricity ● Traditional biofuels ● Nuclear electricity ● Modern biofuels  
● Coal ● Crude oil ● Natural gas



**NO CLIMATE POLICIES**  
4.1 – 4.8 °C

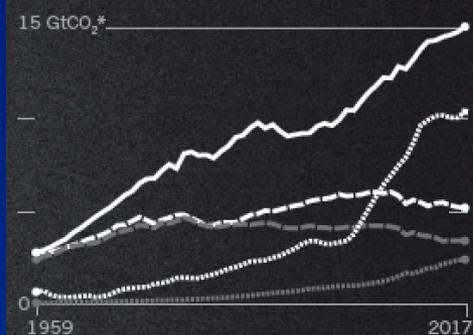
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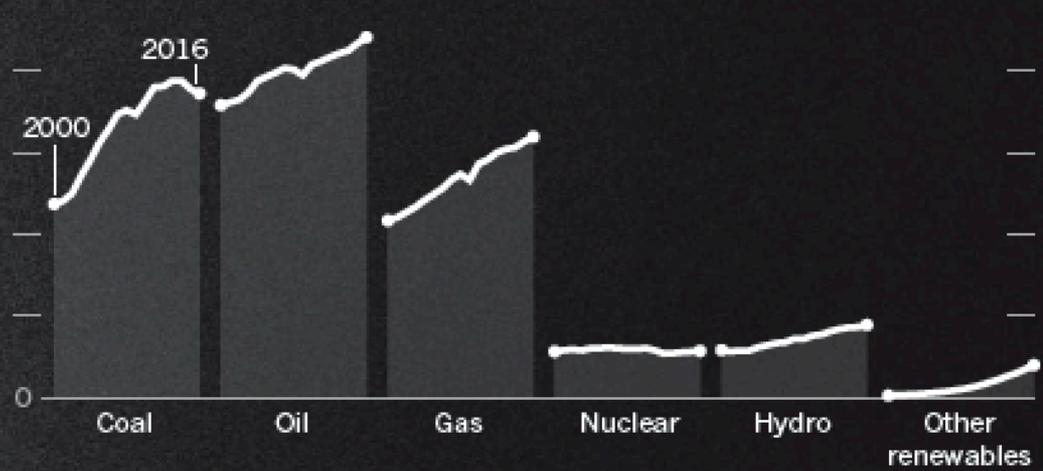


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\*\* Gigatonnes oil equivalent

5 Gtoe\*\*





# Marine Facilities Lu'ukai



# Coconut Island



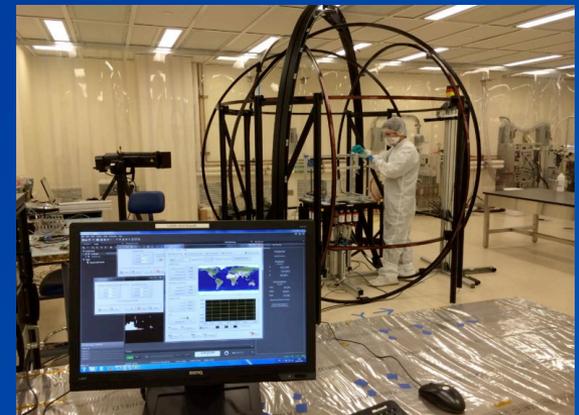
# Marine Center

# KOK Pisces IV & V



## Developing and field testing **new technologies**

- Keck-supported Hadal Profiler
- NASA-supported spectral remote sensing, lidar fluorescence & Raman spectrometry instruments
- NSF-supported Long-Range AUVs for autonomous environmental & microbial monitoring and sampling (with MBARI)
- NASA- and DoD-supported satellite testing, integration and launch facilities of the HSFL.

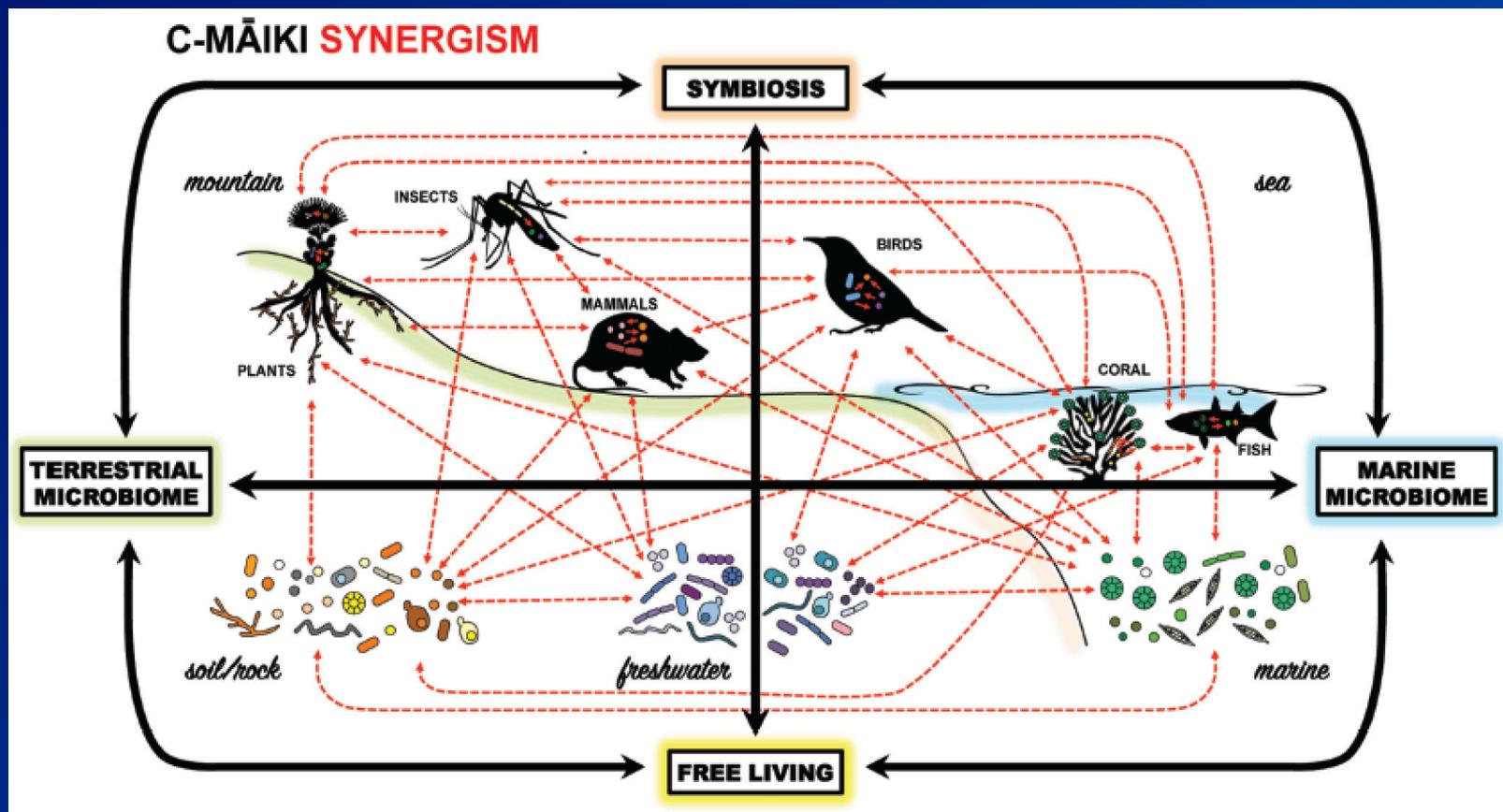


SOEST faculty are leading or co-leading the four largest UH Manoa 2018-2019 strategic initiatives:

- C-MAIKI
  - SMART Ala Wai
  - Material Sciences
- Data & Computational Sciences

# Center for Microbiome Analysis through Island Knowledge and Investigation (C-MAIKI):

Margaret McFall-Ngai, Nicole Hynson, Kiana Frank, Rosie Alegado, Andrea Jani, Matt Medeiros, Craig Nelson, Olivia Nigro, Joanne Yew  
+ CNS (Botany, Math), CTAHR (PEPS, TPSS), M.ENG



# **Strategic Monitoring And Resilience Training in the Ala Wai Watershed: *SMART Ala Wai***

Brian Glazer, B. Chee, R. Alegado, M. Cooney,  
E. DeCarlo, H. Dulai, M. Guidry, M. McManus,  
C. Measures, C. Nelson, J. Potemra, B. Powell,  
F. Sansone, G. Steward  
+ COE, CSS, CTAHR, ENG

Water quality monitoring & sampling network  
and a data dissemination & outreach plan

# Hawaii Institute for Data & Computation

Jason Leigh, Gwen Jacobs, Mahdi Belcaid

Data & Computational Science:

including data analytics, high performance computing, security and data-driven research and decision making.

The proposal was co-developed by a diverse group of faculty including:

**ICS:** Scott Robertson, Guylaine Poisson, Lipyeow Lim, Susanne Still, **CoE:** Marcelo Kobayashi, David Ma, **Math:** Monique Chyba, Ralph Freese, Yui Mileyko, Bjoern Kjos-Hanssen **Business:** Anthony Vance, Pedro Villarreal, Wei (Victor) Huang, **School of Communications:** Jenifer Winter, Gerald Kato, **Physics:** Philip von Doetinchem, Pui Lam, Sven Vahsen, **Institute for Astronomy:** Guenther Hasinger, Eugene Magnier, Curt Dodds, **JABSOM:** Youping Deng, Lana Garmire, **Biology:** Andy Taylor, **SOEST:** Przemyslaw Dera, **CTAHR:** Gernot Presting, **IPRC:** Kelvin Richards, **Digital Arts & Humanities:** Richard Rath, **Urban Planning:** Makena Coffman, **UHERO:** Jon Page, **Manoa Outreach College:** Alice Li.

# UH Materials Science Consortium for Research and Education

Nicolas Gaillard (HNEI), Hope Ishii (HIGP), Matthieu Dubarry (HNEI), Joe Brown (MEng), Sangwoo Shin (MEng), Przemyslaw Dera (HIGP), Klaus Sattler (Physics), Craig Jensen (Chemistry), Mehrdad Ghasemi-Nejhad (MEng) and Murli Manghnani (HIGP).

Synthesis of advanced materials and state-of-the-art analytical capabilities down to atomic resolution, including aberration-corrected transmission electron microscopy, scanning tunneling microscopy, focused ion beam microscopy, time-of-flight mass spectrometry, nuclear magnetic resonance spectroscopy, optical spectroscopies (Raman and Brillouin scattering) and advanced X-ray diffraction, for renewable energy generation and storage technologies, as well as carbon-based nano-materials.

SOEST Strategic Planning – start by unit

Earth Ocean Atmosphere Climate

Planets Ecosystems Energy

Science & Technology

Education, Research & Development

Remote sensing,

in situ observations,

lab-based analyses,

instrumentation development,

visualization, modeling & forecasting

of the Environment