



Ka Wā El Niño ma Pu'uwa'awa'a

*E ho'omalua 'ia nā kumuwaiwai o ka 'āina
i ka ho'omaopopo 'ana i ke aniau i ka wā El Niño*

Ka Wā El Niño a La Niña

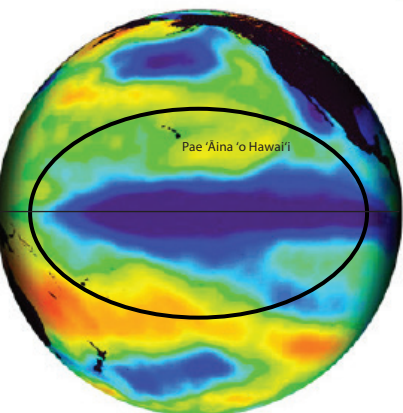
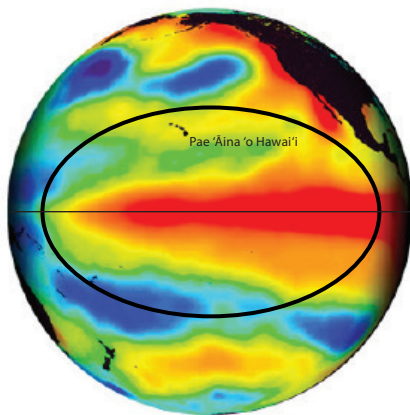
'O ka El Niño-Southern Oscillation (ENSO), 'o ia nō kekahi hanana kūlohelohe o ke aniau o ka honua, pili i ka loli o ka wela o ka 'ilikai ma ka hikina a ma waena o ka Moana Pākīpika kopikala. 'O ke kumu o ia loli 'ana o ka wela, 'o ia nō ka loli 'ana o ka makani e ho'one'e ana i ke kai mai ka hikina a hiki i ke komohana o ka Pākīpika. I ka wā **La Niña** (anu) o ka ENSO, pā ka makani ikaika e ho'one'e 'āwīwī ana i ke kai hu'ihu'i o ka moana mai ka hikina a hiki i ke komohana, a hu'ihu'i ke kai ma kahi o Hawai'i. I ka wā **El Niño** (mehana), pā aheahe ka makani, a no laila, hiki ke omo 'ia ka ikehu wela ma muli o ka ne'e lolohi 'ana o ke kai, a 'o ka 'ilikai mehana ka hopena.

Ke Anilā i Ka Wā El Niño ma Hawai'i

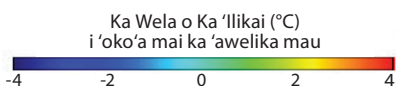
Ma Hawai'i, loli ka nui o ka ua a me ka wela o ke ea i ka wā El Niño a me La Niña pū. I ka wā El Niño, 'u'uku ka ua, a pī'i a'e ka wela o ke ea i ke kau ho'oilo (Nowemapa a hiki i 'Apelila), a i ka wā La Niña, nui ka ua a hu'ihu'i ke ea. I ke kau wela (Mei a hiki i 'Okakopa) loli ke 'ano o ke anilā: 'o ka mea ma'amau, nui ka ua i ke kau wela i ka wā El Niño, a malo'o ke kau wela i ka wā La Niña.

'Oko'a ka ikaika o nā wā pākahi, o El Niño a me La Niña. Inā wela loa a i 'ole hu'ihu'i loa ka 'ilikai, he wā ikaika loa ia. Inā 'ano mehana a i 'ole 'ano hu'ihu'i ka 'ilikai, he wā 'ano ikaika ia. I ka hapanui o ka manawa, 'oi aku ka malo'o o ke kau ho'oilo i ka wā El Niño ikaika loa. I ka wā El Niño 'ano ikaika, 'ike 'ia nā anilā like 'ole (ka malo'o a me ka ua).

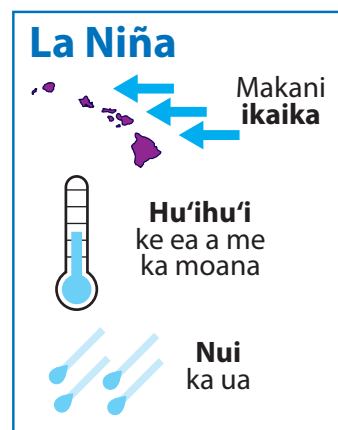
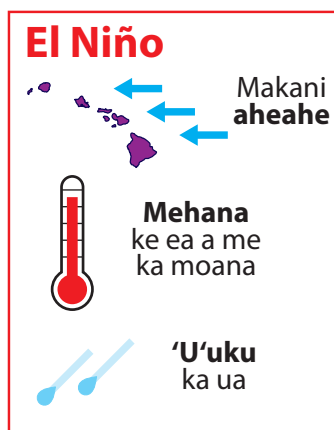
**'O'i aku
ka Mehana**
o ka moana ma kahi
o Kapikoowākea
i ka wā **El Niño**



**'O'i aku
ka Hu'ihu'i**
o ka moana ma kahi
o Kapikoowākea
i ka wā **La Niña**



Ke 'Ano Aniau o ke Kau Ho'oilo i nā Wā o ka ENSO

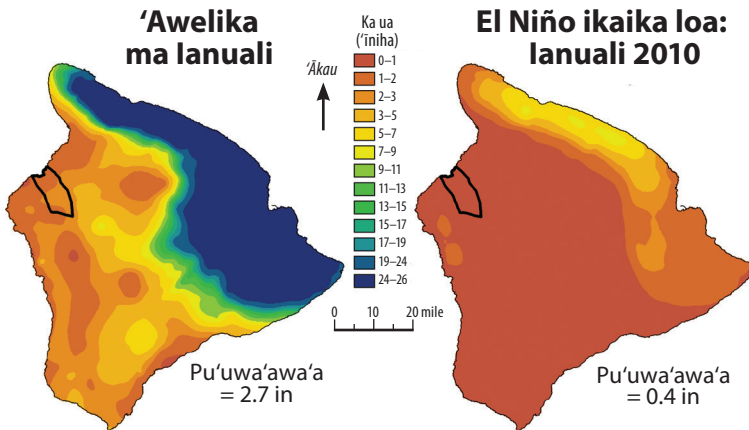


Ki'i 2 (ma luna): Ke aniau o ke kau ho'oilo (Nowemapa-'Apelila) i nā wā El Niño a me La Niña o ka ENSO.

Ki'i 1 (ma ka hema): Ke kūlana wela o ka moana i ka wā El Niño a La Niña o ka ENSO. Na Steve Albers, NOAA

Ka Hopena o ka Wā El Niño ma Pu'uwa'awa'a

He 3 'iniha ka 'awelika o ka ua i loko o ho'okahi mahina o ke kau ho'oilo ma Pu'uwa'awa'a, akā, i ka wā El Niño ikaika loa, 'uuku loa ka ua, ma lalo o ho'okahi 'iniha. I ka wā El Niño ikaika loa o lanuali i ka makahiki 2010, he 0.4 'iniha ka nui o ka ua i 'oi aku ka malo'o he 86% ma luna o ka 'awelika mau ma lanuali, a ua 'oi aku ka wela he 1.3°F ma luna o ka mau.



Ki'i 3: Ka 'awelika o ka ua i ka mahina 'o lanuali (ma ka hema) a me ka ua i ka mahina 'o lanuali i ka makahiki 2010 (ma ka 'ākau).

He Mea Nui Kēia i ke Aha?

Nā Hopena Like 'Ole ma ka 'Āina

Ua pili kekahi o nā wā malo'o 'ino loa i 'ike 'ia ma Pu'uwa'awa'a i nā hanana El Niño i ke kau ho'oilo. I ka loli nui 'ana o ka ua, pilikia nā kumuwaiwai kūlohelohe i nā hopena 'ino, e like me ka make 'ana o nā lā'au 'oiwi (nā kawowo lā'au a me nā lā'au kahiko), ka ho'olaha 'ia 'ana o nā meaola malihini, a me ka ho'opō'ino 'ana i nā meaola 'ane make loa. Inā 'uuku ka ua a me ka pā kawaūea, hiki ke 'ā koke ke ahi lalapa wale. I ka hopena o Malaki i ka makahiki 2016, i ka wā El Niño ikaika loa, ua pau i ke ahi he 1,800 'eka ma Pu'uwa'awa'a. Ua hō'ā 'ia kēia ahi e ka uila, a ua hōlapu akula ma muli o ka malo'o o ka 'āina (ka pā kawaūea ha'aha'a loa), ka ikaika o ka makani, a me ka nele i ka ua. I loko o nā mahina 'ekolu ma mua o kēia ahi, ua emi iho ka nui o ka ua he 40% ma lalo o ka ua mau, ua 'oi aku ka nui o ka wela he 1.4°F ma luna o ka wela mau, a ua emi iho ka pā kawaūea he 6% ma lalo o ka mau. Ua 'ā kēia ahi no 'ehā lā, a ua ho'olilo 'ia he \$135,000² a 'oi aku no ke

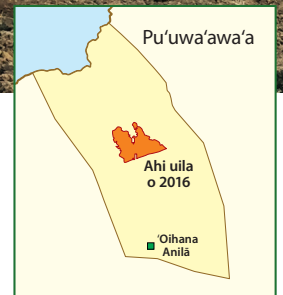
kinai 'ana i kēia ahi. 'O ka meakanu i pau nui i ka 'ā 'ia, 'o ia nō ka mau'u fountain. He mau'u malihini kēia i laha aku ma nā wahi like 'ole, i uluāhewa i ka malo'o, a pa'akiki ka ho'emi 'ana iho³.

He mea ko'iko'i ka ho'omaopopo 'ana i ka manawa, ka nui, a me ka lō'ihi o ka hanana El Niño no ka ho'olālā 'ana i nā hana ho'omaluku pono, e like me ka ho'olako 'ana i nā kumuwaiwai (nā lako a me ka po'e kōkua), ka ho'oulu hou 'ana i ke kawowo, ka ho'emi 'ana i nā meaola malihini, a me ka mālama 'ana i nā 'ano'ano kākā'ikahi⁴. Hō'ike 'ia ka manawa a me ka nui o ka ENSO i kekahi mau mahina ma mua o ia hanana, no laila, hiki i nā luna mālama 'āina ke ho'mākāukau a no'ono'o mua e pale i ka pō'ino i ke ahi.



Ki'i 4: Hō'ike 'ia kahi o ke ahi uila i ka makahiki 2016 ma Pu'uwa'awa'a.

Na Don Yokoyama, DLNR-DOFAW



¹ Giambelluca et al. (2013) <https://doi.org/10.1175/BAMS-D-11-00228.1>

² DLNR (2016) Fire Report, Puu Waawaa Lightning Fire, HA-16-0003

³ Wada et al. (2017) <https://doi.org/10.2984/71.4.2>

⁴ Management Plan for the Ahupua'a of Pu'uwa'awa'a and the Makai Lands of Pu'u Anahulu, <https://dlnr.hawaii.gov/forestry/files/2014/06/PuuWaaWaaplanv6.pdf>

Na ka Pacific Islands Climate Adaptation Science Center i kākō'o i kēia papahana