

SR 32

UNIVERSITY OF HAWAII AT MANOA

School of Ocean and Earth Science and Technology
Department of Meteorology

Testimony from Dr. Yi-Leng Chen, Professor of Meteorology, University of Hawaii at Manoa

March 22, 2012

Climate change is a reality and it is a global phenomenon without political boundaries affecting every location on the planet.

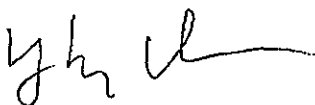
Surface air temperatures in Hawai'i have increased by 0.38°C during the 1919-2006 period, equivalent to 0.043°C per decade. The warming rate in Hawai'i since 1975 has been much higher, 0.164°C per decade. Climate models used in the Intergovernmental Panel on Climate Change (IPCC) simulate similar warming rates by including both anthropogenic and natural forcing, but point to much greater warming for the next century. Hawai'i is expected to experience a continued warming trend, along with alterations in rainfall patterns, surface winds, and solar radiation at small scales due to the presence of steep mountains, intricate land-sea contrasts and heterogeneous land surfaces. These alterations will likely cause changes in soil and coastal erosion, coastal inundation and hazards, incidence and severity of wildfires, land cover and land use, terrestrial biodiversity, marine and terrestrial ecosystem structure and function, watersheds and water resources, renewable energy (wind, solar, and wave) resources, and air quality, to name a few.

Over the last century, Hawai'i has experienced a pronounced downward trend in rainfall affecting the water resources of our state. Stream flow records also show a long-term decline. Reductions in water availability and precipitation would affect plant growth and survival with subsequent alterations in the frequency and intensity of wildfires. Furthermore, climate change may augment invasions by nonnative plants, animals, pests, and pathogens. The frequency and intensity of extreme hydrological events (heavy rainfall and drought) in Hawai'i have also changed. Increased variability in rainfall patterns and increased heavy rainfall events would result in greater frequency of flooding and slope and coastal erosion, which would in turn affect the quality of surface and ground water and coastal marine ecosystems.

The trade-wind strength over the mid-Pacific may also change in a warming climate with an increasing trend. Changes in the trade-wind strength would affect not only the airflow and weather over the islands, but also coastal wind systems with strong impacts on ocean circulations, natural resources, and marine ecosystems over the coastal waters.

The practical implications of these changes must be urgently addressed by resource managers and decision makers toward the designing and developing of adaptation strategies. On the other hand, to combat this warming trend and the long-term alarming threat, we will need the cooperation and efforts of all countries from the international community. The United Nations

Framework Convention on Climate Change Conference of Parties (UNFCCC-COP) is a key instrument to combat global warming which acknowledges that the "global nature of climate change calls for the widest possible cooperation". Taiwan (ROC) is a developed and highly industrialized country. Taiwan (ROC) is eager and prepared to join the international community to play a more active role in global efforts towards reducing global carbon emissions and enhancing energy efficiency. I would like to urge your support for granting Taiwan participation as an Observer in the United Nations Framework Convention on Climate Change Conference of Parties.



Yi-Leng Chen

Professor of Meteorology

University of Hawaii at Manoa

Honolulu, HI 96822

Phone: (808)-956-2570

Fax: (808)-956-2877

Email: yileng@hawaii.edu

Testimony for Taiwan's UNFCCC Observership

Pao-Shin Chu

Department of Meteorology and Hawaii State Climate Office

University of Hawaii-Manoa

Honolulu, HI 96822

Tel: 808-956-2567

Email: chu@hawaii.edu

March 22, 2012

As Hawaii State Climatologist officially recognized by NOAA and Professor of Meteorology at the University of Hawaii in Manoa, I would like to comment on the following three points, all of which I think are important for the Republic of China (Taiwan) to be granted as an Observer in the United Nations Framework Convention on Climate Change (UNFCCC).

First, climate change sees no boundaries as the atmosphere is free to move around. It is only through the global effort that we can meaningfully reduce greenhouse gas emissions. It is worthy to point out that the level of Taiwan's carbon dioxide emissions increased sharply in recent years and the UNFCCC needs Taiwan's cooperation to make its global campaign complete and effective.

Second, because of its unique geographic location in East Asia and the wealth of numerous meteorological data over the past 100 years, Taiwan plays an indispensable role in contributing to global climate data collection and analysis. The data collected by Taiwan include the conventional surface and upper air soundings for temperature, precipitation, wind, humidity, and others. In addition, Taiwan has data from an advanced meteorological Doppler radar network, satellite GPS systems, and the state-of-the-art dropwindsonde observations for typhoons. These data are important for understanding how climate in east Asia and western Pacific has changed.

Third, with ample experience in numerical modeling and prediction systems, Taiwan is one of the few countries in the Asia Pacific capable of issuing forecasts for both severe weather events and short-term climate.

Such information can help countries in Southeast Asia and Pacific islands for making policy or taking action related to disaster prevention and resource management.