



Climate Services

SHOULD WE FOLLOW THE WMO?

The Washington Post

Congress nixes National Climate Service

By **Brian Vastag**

November 20, 2011

The [National Oceanic and Atmospheric Administration](#) wanted to reshuffle its offices to establish a [National Climate Service](#) akin to the agency's [National Weather Service](#). It asked for no new funding to do so.

National Weather Service



vs. National Climate Service

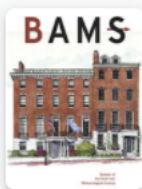
台灣終於也開始ㄌㄚ

Asia Pacific Climate Service Workshop

Taipei:
28–29 October 2019



< Previous Article Next Article >



**Bulletin of the
American
Meteorological
Society**

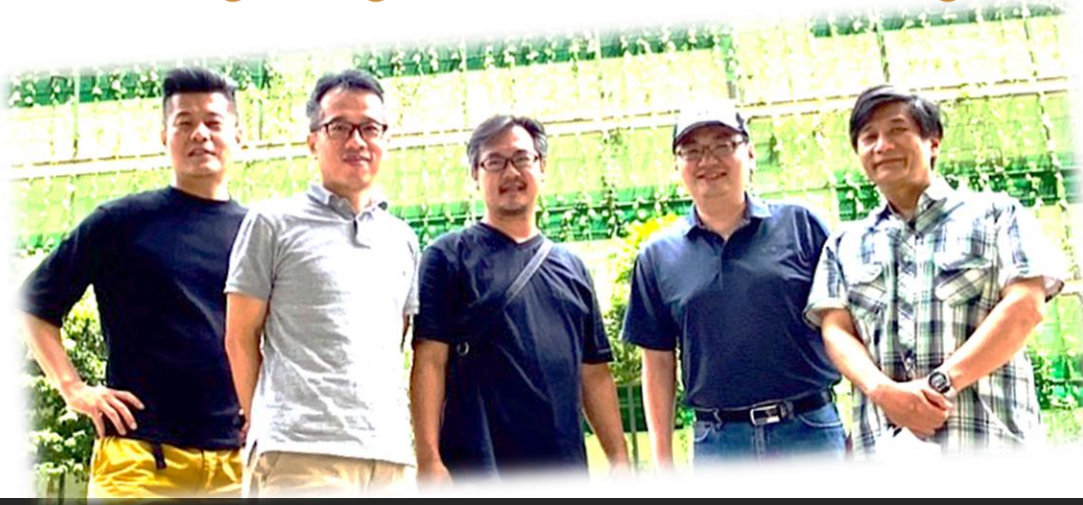
≡ Volume 101: Issue 9 ▼

▼ Sections

Climate Services in Asia Pacific: Emerging Trends and Prospects

Chia-Ping Cheng¹, Hen-I Lin², Simon Wang³, Po-Tin...

[View More +](#)

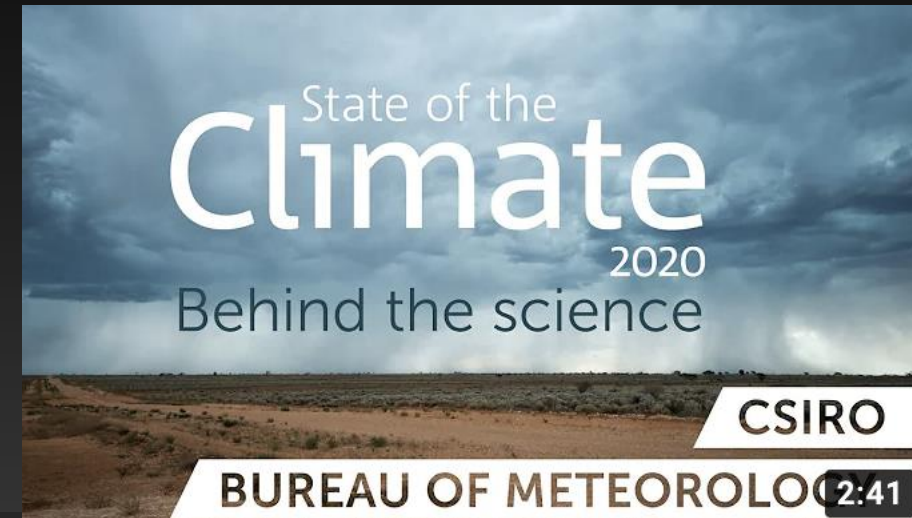




What is a climate service?



WHO DEFINES IT?




What is a climate service?

Australian Government
Bureau of Meteorology

Some key challenges...

Understanding probabilities

2015/16 engagement: **User comprehension** is linked with **user satisfaction** i.e. those that answered comprehension questions incorrectly were 3 times as likely to be dissatisfied with the service



Conveying accuracy/skill

Courtesy of Beth Ebert

「越不懂的用戶越不滿意」
「教育用戶預報的重要性」

Australian Government
Bureau of Meteorology

Rural RnD4Profit Project: Forewarned is forearmed

Australian Government
Department of Agriculture and Water Resources

Forewarned is forearmed: managing the impacts of extreme climate events

Research partners

- BoM
- Univ. Melbourne
- Monash Univ.
- Univ. S. Queensland
- SARDI
- DEDJTR
- DAFQ
- Birchip Cropping Group

USERS

Rural RDC & other partners

- Meat and Livestock Australia
- Grains RDC
- Sugar Research Australia
- Cotton RDC
- Rural Industries RDC
- Dairy Australia
- Wine Australia
- Australian Pork
- Suncorp

Managed by Meat and Livestock Australia; 17 collaborating partner organisations; 2017-2022

「S2S極端天氣/極端氣候預報
日趨重要，尤其是農業」

Australian Government
Bureau of Meteorology

Summary

A Climate Service

- is a step up from a climate map or climate data
- is driven by **user needs** and user decision making
- turns data into information and **intelligence**
- is **adaptable** and **transferrable**; it should be made to survive into the future without your personal assistance
- is **HOW** you extract **value** from climate research and products

Interpreting Climate Outlook Example

以資料賦予用戶權力

Australian Government
Bureau of Meteorology

3. Linking forecasts and user decisions

Work package 3: Interfacing to Industry decisions

Research partners

- BoM
- Univ. Melbourne
- Monash Univ.
- Univ. S. Queensland
- SARDI
- DEDJTR
- DAFQ
- Birchip Cropping Group

Rural RDC & other partners

- Meat and Livestock Australia LTD
- Grains RDC
- Sugar Research Australia LTD
- Cotton RDC
- Rural Industries RDC
- Dairy Australia LTD
- Wine Australia
- Australian Pork LTD
- Suncorp

「協助用戶建立預報-決策SOP」

What is a climate service?



IRI – a role model?

Ángel Muñoz presently serves as co-chair of the Climate Information for Decision Making (I4D) project in the World Climate Research Programme (WCRP) Working Group on Subseasonal-to-Interdecadal Project; in the R2O group of the WCRP S2S Prediction Project

Lamont-Doherty Earth Observatory
COLUMBIA UNIVERSITY | EARTH INSTITUTE

state of the science



INTERNATIONAL
COUNCIL
FOR SCIENCE



Sharpening our view on climate research

Nature Climate Change (2017) | doi:10.1038/nclimate3206

Published online 16 January 2017

“Human activity is changing Earth's climate. Now that this has been acknowledged and accepted in international negotiations, climate research needs to define its next frontiers.”

state of the science



three scientifically rich fundamental questions to guide current and future climate research:

- 1. Where does the carbon go?**
- 2. How does the weather change with climate?**
- 3. How does climate influence the habitability of the Earth and its regions?**

Our Climate vs. Their Climate

-- as a cause

-- as a goal

“CLIMATE” IS A DIFFERENT WORD
NOWADAYS

氣象本位已非主流

若再以氣象角度思考「氣候」，將會侷限在既有氣象資源上





ILLUSTRATION BY JOÃO FAZENDA

WMO,
Dame it!



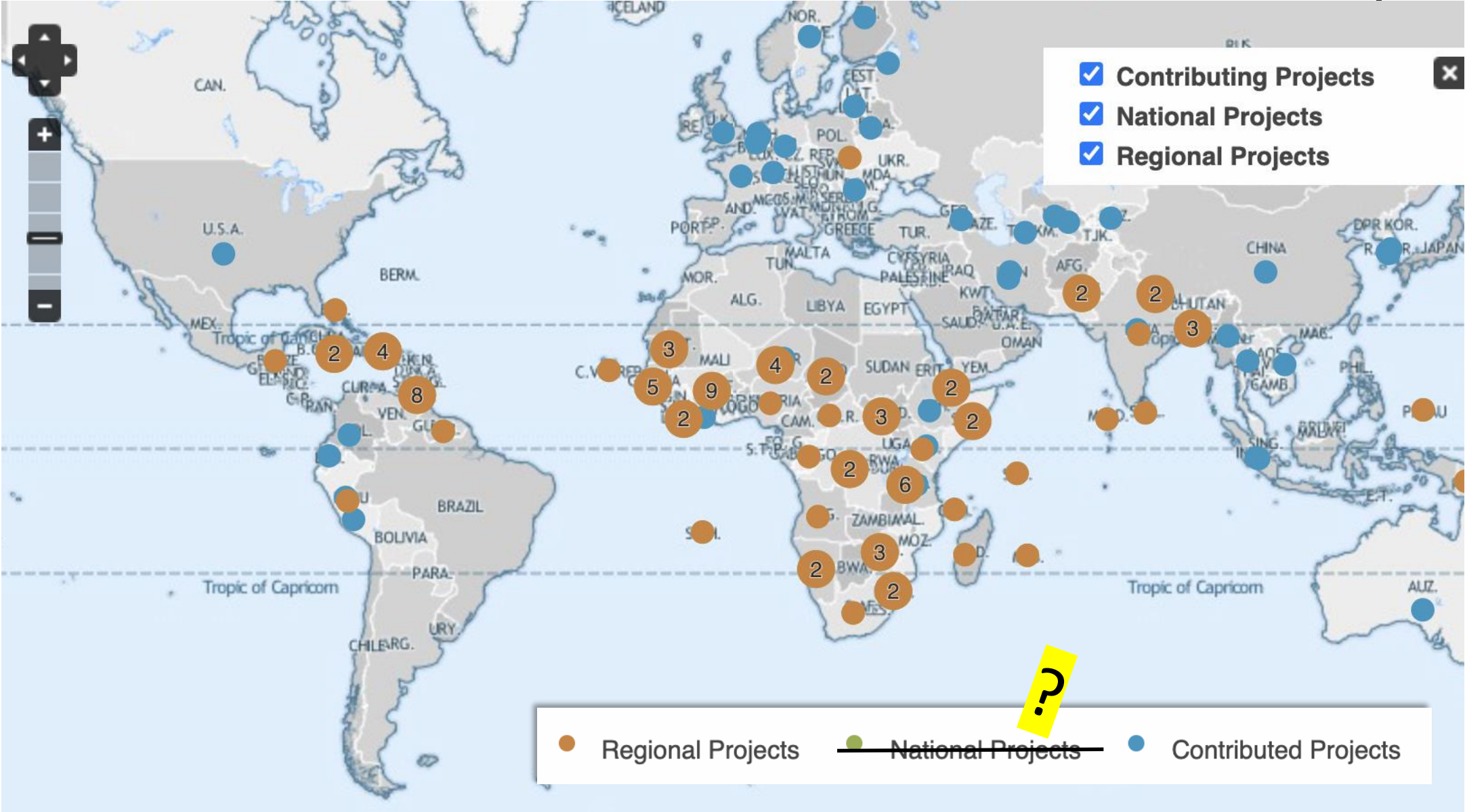


Global Framework for Climate Services ©WMO | Gfcs

Established in 2009 to enable better management of the risks of climate variability and change, and adaptation to climate change,

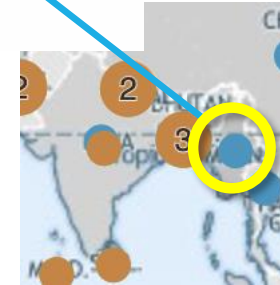
through science-based climate information and prediction into planning, policy and practice on the global, regional and national scale.

Global Framework for Climate Services ©WMO | Gfcs



Cooperation between MET Norway and the NMHSs in Bangladesh, Myanmar and Vietnam on Capacity Building

These projects between the NMHSs in Bangladesh, Myanmar, Vietnam and Met Norway, are supported and funded by the Norwegian Ministry of Foreign Affairs (MFA) and are in collaboration with Asian Disaster Preparedness Center (ADPC).



...established through...Bill & Melinda Gates Foundation
for improving the preparedness and emergency response
to disasters in Asia

Assessing Sustainability and Effectiveness of Climate Information Services in Africa (Sustainable CIS)

Official website of the Global Framework for Climate Services ©WMO | Gfcs

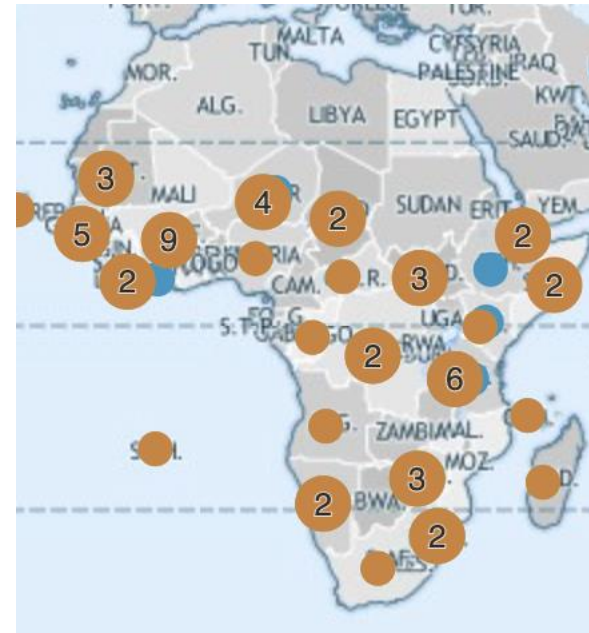
“A GFCS funded (regional) project”?

Another example...

The USAID-funded Learning Agenda on Climate Services in Sub-Saharan Africa is made up of two related efforts that seek to generate and analyze new information...



NGOs...



Climate Services for Increased Resilience in the Sahel

Official website of the Global Framework for Climate Services ©WMO | Gfcs

“A GFCS funded (regional) project”?

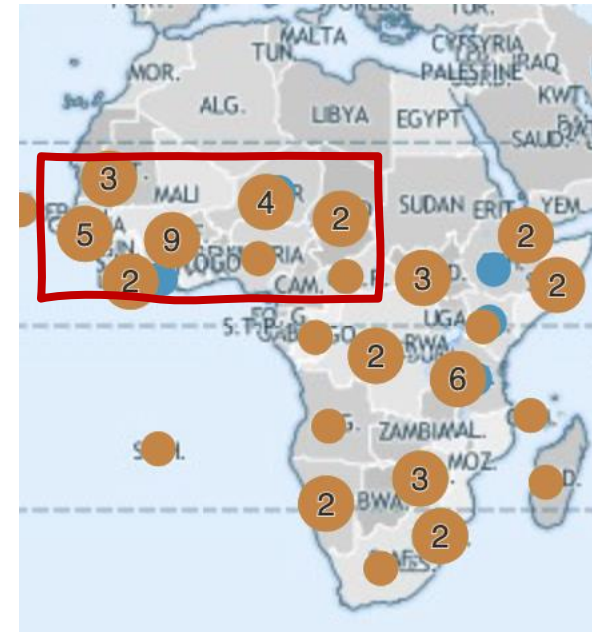
Yet another example...

Donor:

United States Agency for International Development (USAID)

Funds received by:

African Centre of
Meteorological
Applications for
Development
1985-2019



2011

Past and Future Climate Assessments of Livestock Vulnerability in Nepal



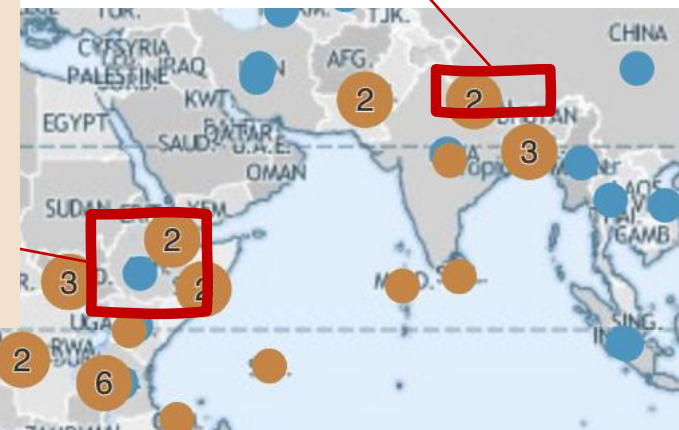
2013

Improving the Resilience of Mixed Farm Systems to Pending Climate Change in Far Western Nepal

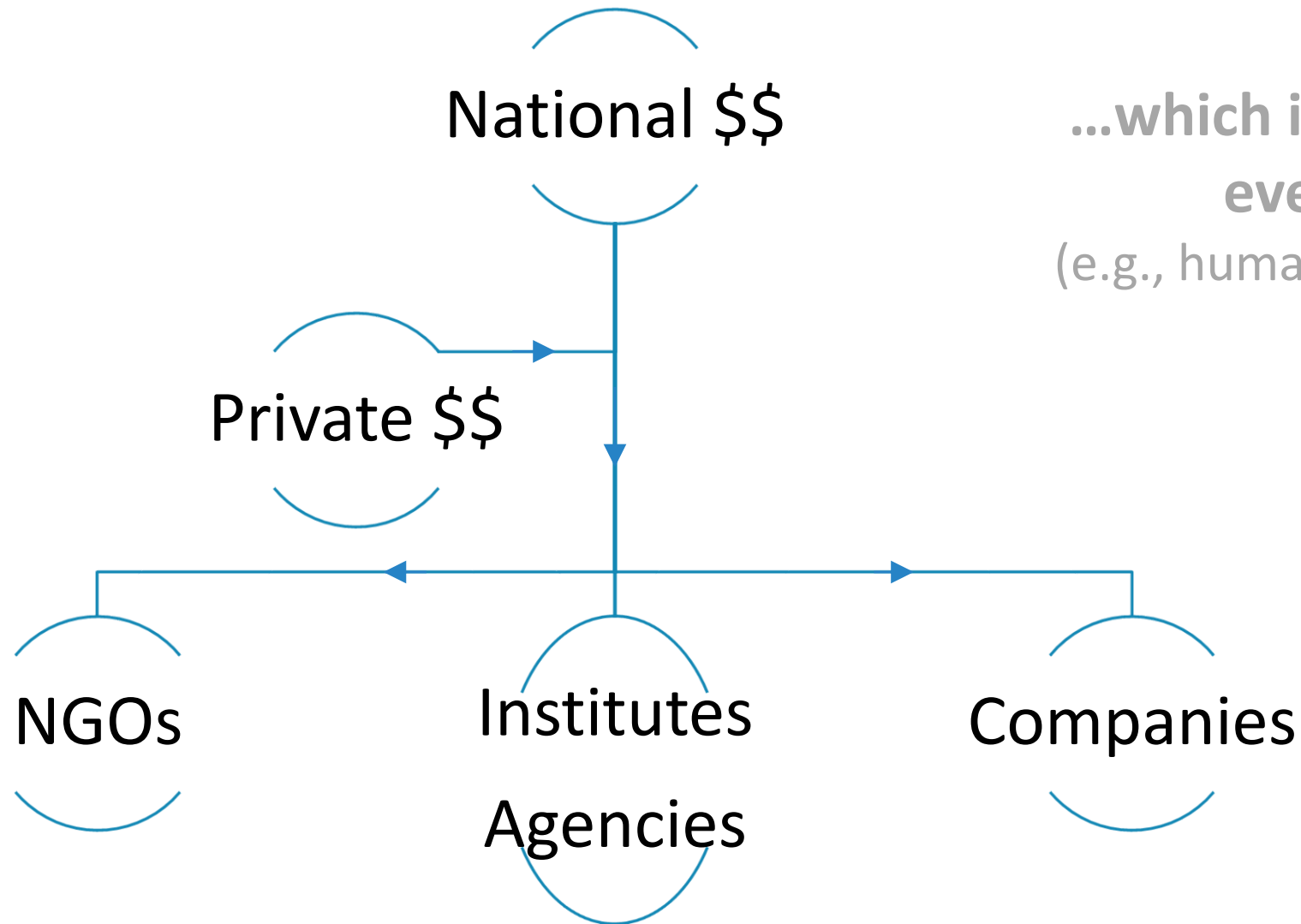


Building decadal climate predictions for East Africa to aid in the fostering of agricultural resilience in the semi-arid ecosystems of Ethiopia

2014



So, UN's GFCS is basically an NGO enterprise!



...which is the same as
everything else~
(e.g., humanitarian, health,
food, finance...)

One cross-cutting issue in the five steps is to keep focus

What Do We Mean by Climate Services?

Why should we care?

(why should Taiwan care what WMO means by climate services?)

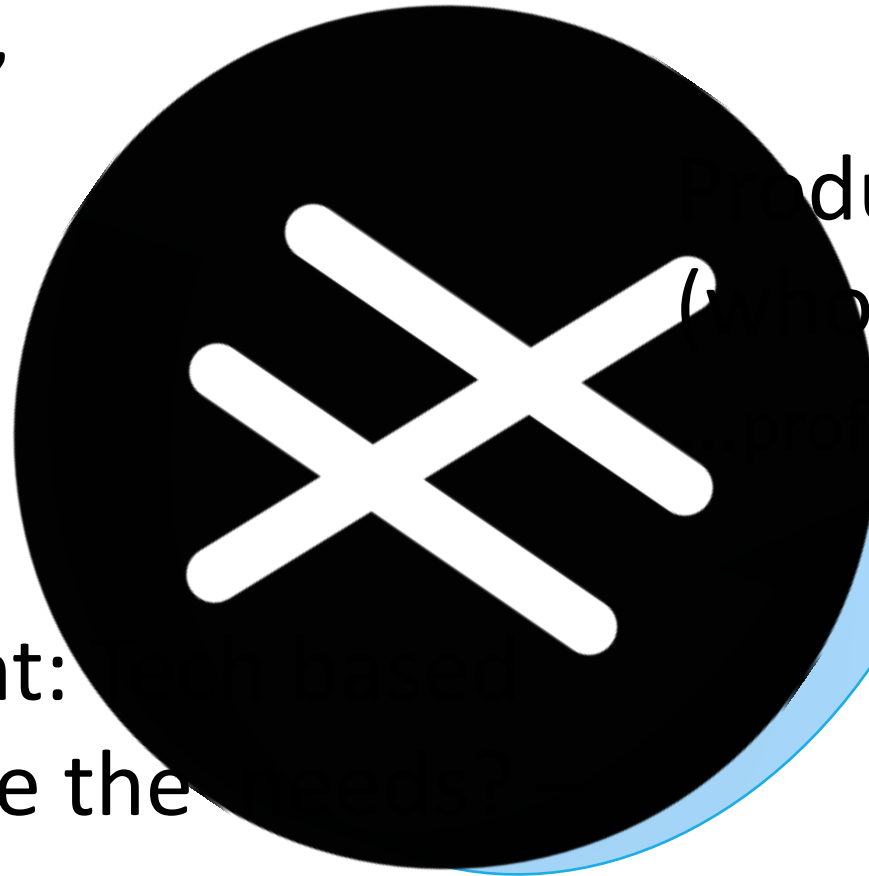


Services

Research: Science based

(big-picture science,
where the need is)

Development:
(how to solve the
informatics)



Product: Client based
(what needs that?
stability)

Research: Market

Isn't it what 科技中心 is?

Global Framework for Climate Services ©WMO | Gfcs

Established in 2009 to enable better management of the risks of climate variability and change, and adaptation to climate change,

through science-based climate information and prediction into planning, policy and practice on the global, regional and national scale.

A potential partner:



TCCIP

-?-

-?-

-?-

Research

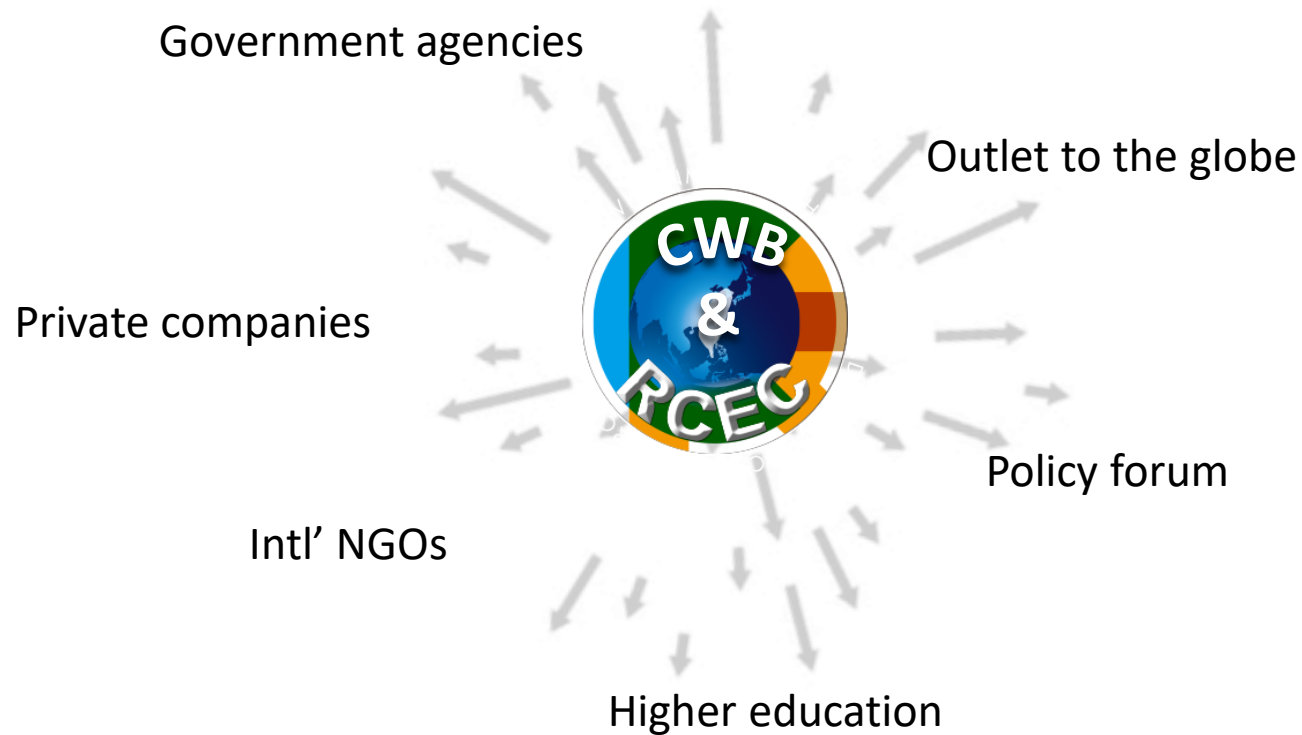
- Anthropogenic Climate Change Center ▼
- Air Quality Research Center ▼
- Ocean Pollution Research Center (in preparation) ▼
- Environmental Resilience & Sustainability Center (in preparation) ▼

through science-based climate information and prediction into planning, policy and practice on the global, regional and national scale.

Being a platform



It connects to all services



it's still in talks with the German automaker on a parts supply agreement.

□ Copy Look Up Speak Share...

survival, which is trying to make it as a truly asset-light automaker. The startup plans to outsource nearly everything with its cars and will instead focus on design and customer relations.

In the interview, Fisker spoke about his

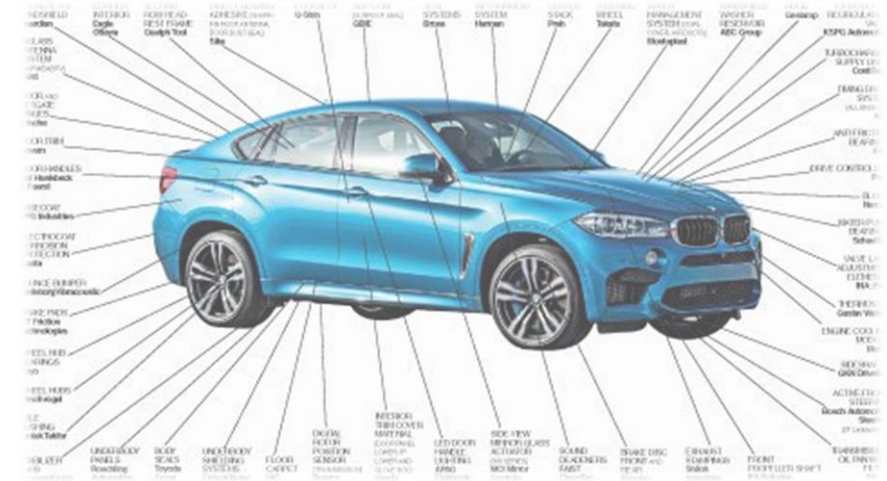
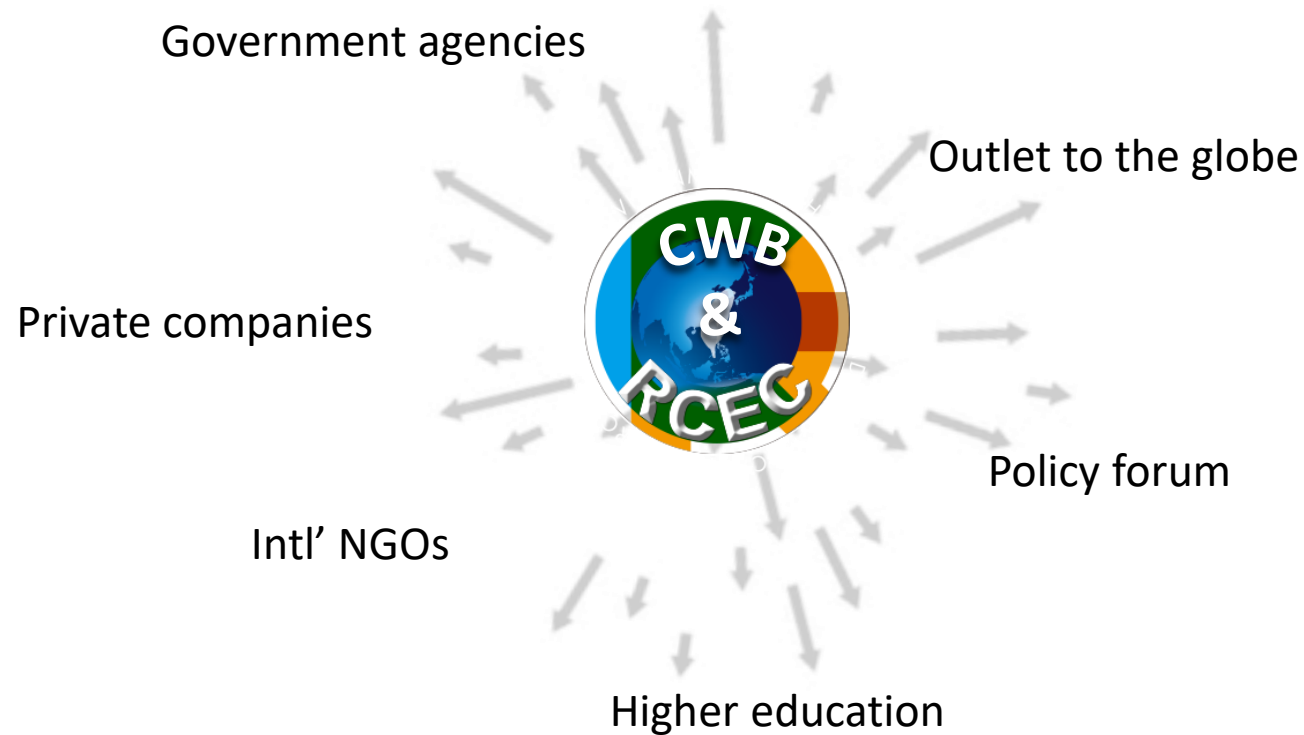


Working with 12,000 suppliers in 70 countries, BMW has a worldwide supplier network that contributes to it





It connects to all entities



It needs a “service” team

(with communication expertise!)



a service team has...

Parallel, not
top-down!



Or an information communication dept.

Program options:

Plants, soils and climate (9+ credits)

- PSC 4820: Challenges in climate change and energy
- PSC 6123: Climate Data Analysis
- PSC 6810: Climate and Climate Change
- PSC 6900: Special topics in climate science

Journalism and communication (9+ credits)

- JCOM 3310: Writing for Public Relations
- JCOM 4110: Computer-Assisted Reporting
- JCOM 5420: The Mass Media and Politics
- JCOM 6300: Case Studies in Public Relations

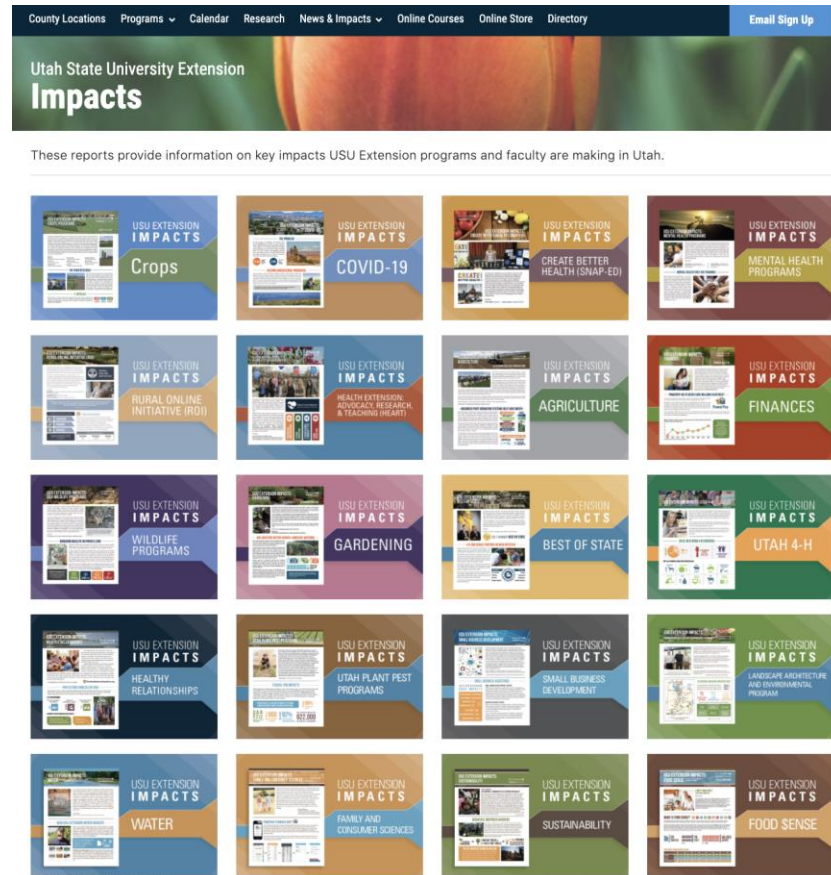
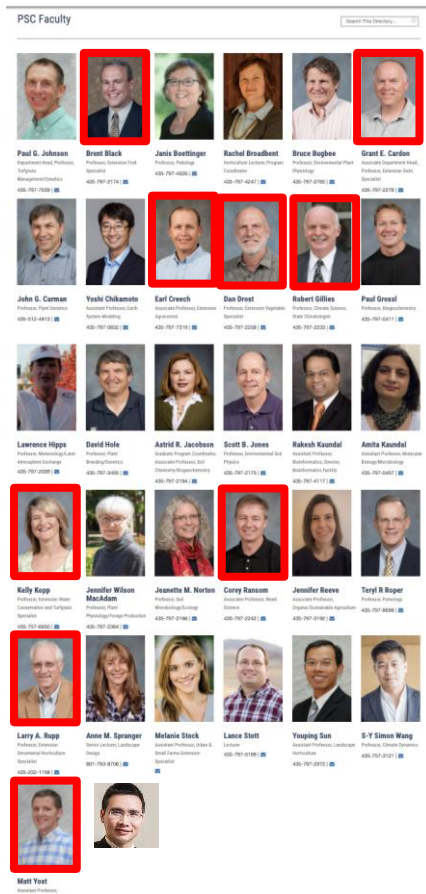
Electives: (9+ credits)

- ADVS 5650: Science Communication
- CMST 3400: Persuasion
- CMST 5250: Communication, Social Justice and the Environment
- ENVS 6410: Translational Ecology
- GEO 3100: Natural Disasters
- GEOG 6400: Natural Hazards and Society
- HST 3950: Environmental History
- JCOM 4010: Mass Communication Ethics
- JCOM 4030: Mass Media Law
- JCOM 5110: Literary Journalism
- PSC 5680: Paleoclimatology
- WATS 3000: Oceanography

Assistant Professor Matthew D. LaPlante

Associate Professor Shih-Yu Wang

Or, with extension personnel



Has its own funding
...and
a marketing director!

What if CWB has a climate service?



跳脫以氣象為主的團隊貴族

資料：開放

保護國內產業 不是 局的義務

後制：收費

獨立or 外包單位 自給自足

知識：平台

收集、分流、明示出處

What if CWB has a climate service?

排除本位思考

不去競爭「客製服務」～做不完的

What if CWB has a climate service?

避免(不斷)增加工作量

採用「直銷」邏輯：下線去拓展，CWB做源頭

Should a meteorologist

bother with “services”?

my story...

My involvement with climate services

State
climate
center

11th CPASW
(with NOAA's
Climate Service
Division)

USAID
works

1st APCSW
(with CWB)

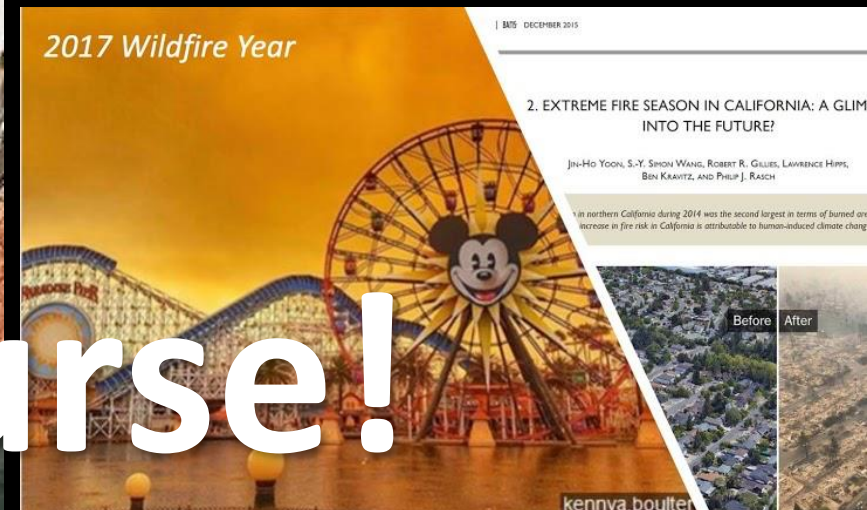
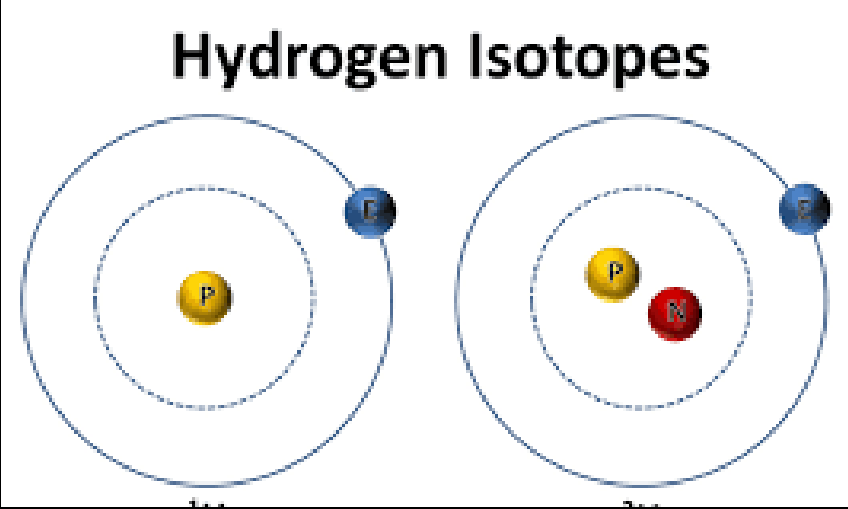
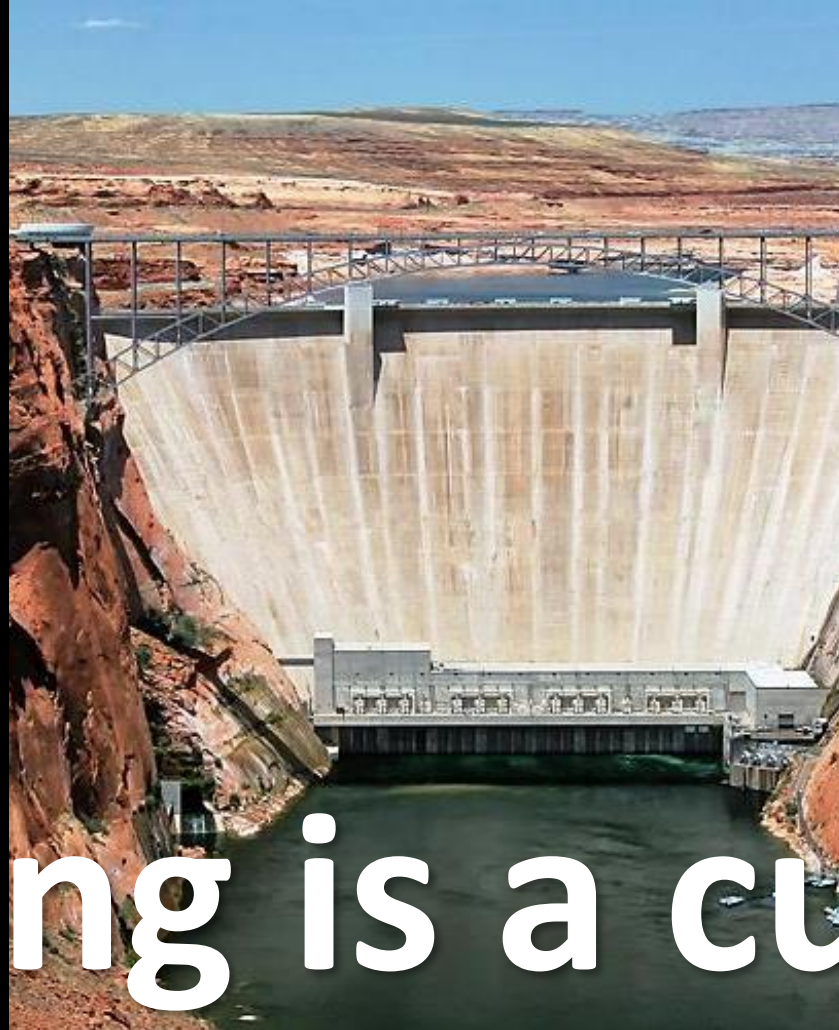
2nd APCSW
(with CWB)

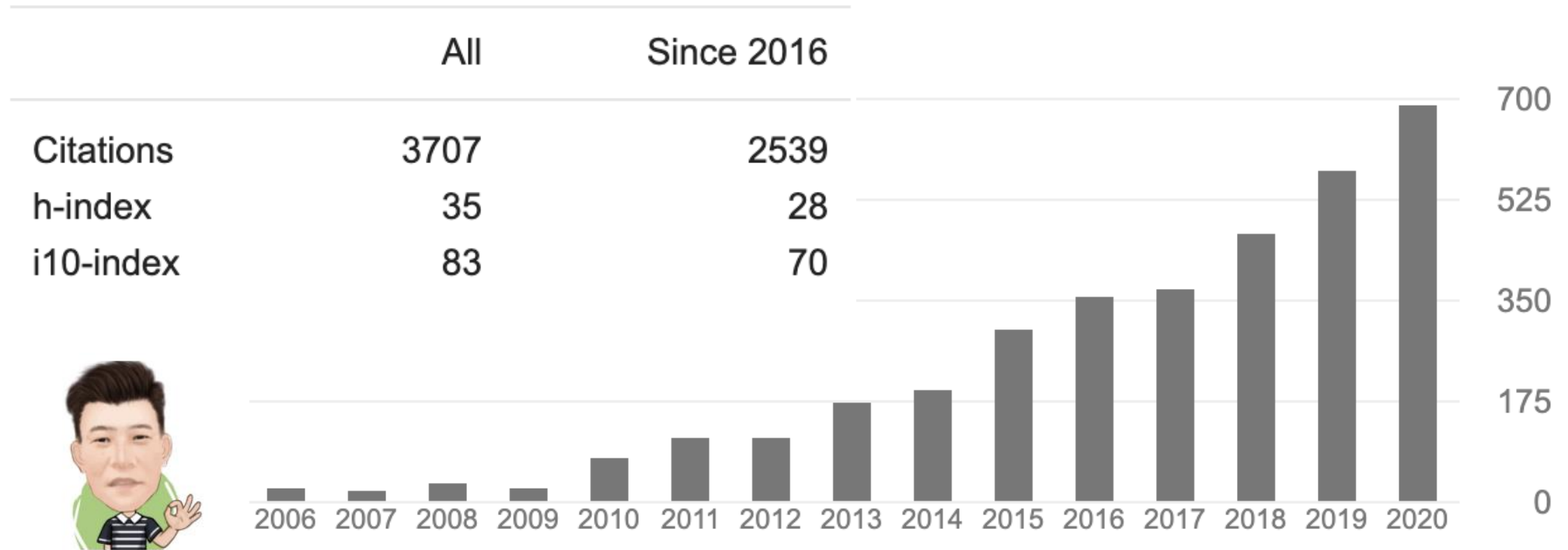
Journal editor of
Climate Services
(Frontier)



Publishing is a curse!

Simon's interdisciplinary works include ecology, forestry, archeology, water resources, fire, etc.

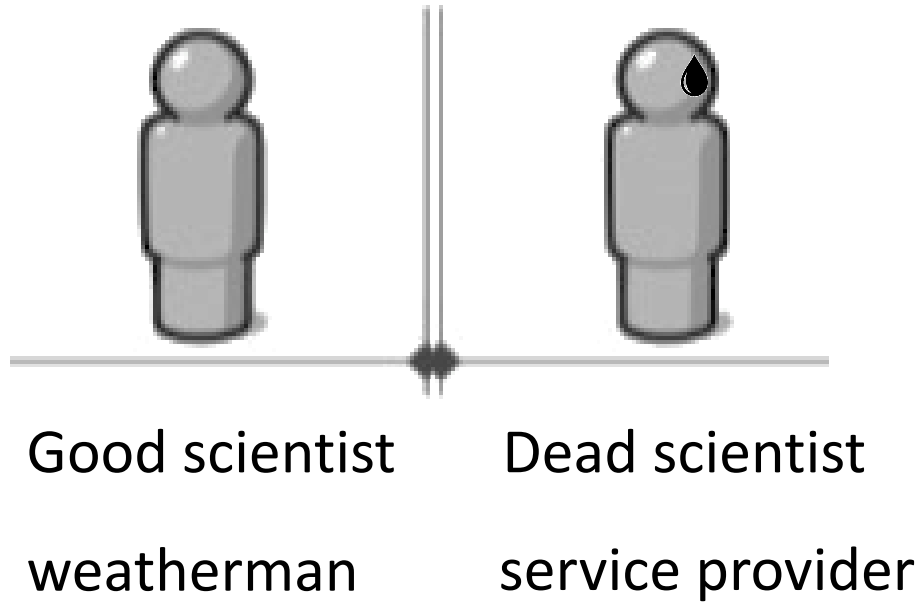




Cross-discipline vs. academic career

which means promotion etc. 😊

Mindset, mindset...

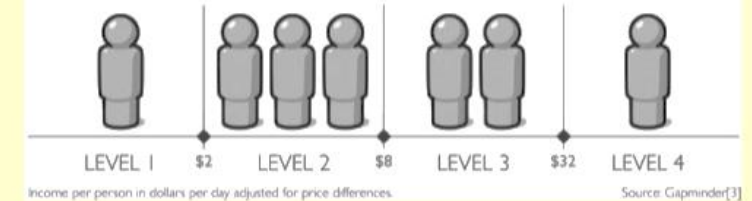


One reason the old labels are so popular is that they are so simple. But they are wrong! So, to replace them, I will now suggest an equally simple but more relevant and useful way of dividing up the world. Instead of dividing the world into two groups I will divide it into four income levels, as set out in the image below.

 **Factfulness**

FOUR INCOME LEVELS

The world population in 2017. Billions of people on different income.



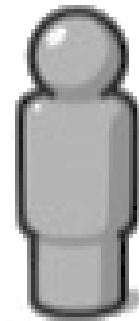
Each figure in the chart represents 1 billion people, and the seven figures show how the current world population is spread out across four income levels,

Mindset, mindset...



Good scientist?

Modern (Climate) Scientists
= better communicators



Bad scientist?

Modern (Climate) Scientists



Climate Services

Volume 20, December 2020, 100199



The next generation of climate services

Katharine L. Jacobs ^a  , Roger Brian Street ^b 

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<https://doi.org/10.1016/j.cliser.2020.100199>

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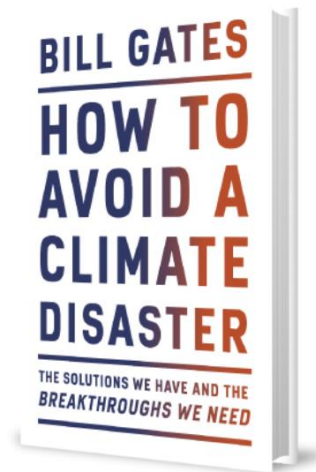
focus on the use of climate science for impact assessments and adaptation to that required to deliver a broader set of societal benefits based on increasing capacity to manage climate and other risks. A “next generation approach” is justified by the complexity and inter-relatedness of climate issues, the broad range of societal challenges, the scope of required actions, the rate at which adaptation and resilience challenges are emerging, and the range of data, tools and methods required. An approach based on transformational relationship-and capacity-building, which is capable of drawing on and informing science, service and practice is needed. Working at the science-to-service-to-

JUST 230 PAGES

My new climate book is finally here

Everything you need to know about avoiding the worst climate outcomes.

By **Bill Gates** | February 14, 2021 • 6 minute read



Climate Services are worth pursuing

As an operation center,
as a meteorologist





We can let
WMO define it
for us...



<https://gfcs.wmo.int/what-are-climate-services>

Or we can
define it
ourselves!



2019 in CWB

Please support the 2021 Taipei

Asian Pacific Climate Service Workshop

Late October

@ CWB

