APEC Climate Center
Tailored Climate Information FOR YOU

August, 2016
I. Who we are: APEC Climate Center (APCC)

II. What we do, generally:
- Climate prediction
- Climate information services
- Interdisciplinary research
- International cooperation & Capacity building

III. What we can do FOR YOU, specifically:
- Pacific Island climate prediction service (ROK-PI CliPS) dynamical-statistical downscaling of seasonal prediction for Pacific Islands
- Agricultural & agro-met service/Water management in Tonga Agriculture and water management, utilizing seasonal forecasts for Tonga
I. Who we are: APEC Climate Center (APCC)
Who we are

APEC Climate Center

Our mission

The mission of APCC is to enhance the socio-economic well-being of member economies by utilizing up-to-date scientific knowledge and applying innovative climate prediction techniques through
1) Climate Prediction,
2) Climate Information Services,
3) Interdisciplinary Research, and
4) International Cooperation.

2005 SOM 1 for the 17th APEC Ministerial Meeting
II. What we do
APCC has developed a climate prediction system based on a Multi-Model Ensemble technique, which collects seasonal forecast data from 17 institutes in 9 economies. And it’s the WORLD BEST!!
Climate Information Service

What we do

- MME Forecast
- Climate information & APCC Data Service System (ADSS)
- CLimate Information toolKit (CLIK)

Climate Prediction

“demand-driven” climate information meets end-users’ needs

Food

Health

Water Management

http://www.apcc21.org
http://cis.apcc21.org
http://clik.apcc21.org
What we do

International Cooperation & Capacity Building

✓ APEC Climate Symposium
✓ APCC Expert Workshop
✓ International Conferences

✓ Training Program (1-week)
  • During last 5 years, APCC has trained about 260 participants from over 50 countries

✓ CLIK Training Workshop (3 days)
  • Since 2015, APCC has trained Climate Researchers in National Met Services for Philippine, Indonesia, Vietnam, Thailand, Brunei.

✓ Young Scientist Support Program (3-months)
  • Since 2011, APCC has invited 65 young scientists from 26 countries
Interdisciplinary Research

What we do

APCC-NCDR Project
“Pilot Study of Early Warning and Risk Assessment on Drought Disaster”

APN Project
“Toward a Fire and Haze Early Warning System for Southeast Asia”

APCC-CRIEPI Project
“Application of Seasonal Forecasts to Predict Electricity Demand in Japan”

ROK-PI CliPS Project
“Nationally Tailored Climate Prediction Information for Climate Change Capacity Building of Pacific Islands”

ASEAN Project
“Science-Based Disaster Management Platform”

Tonga Projects
“Improving Agricultural Productivity through Ensuring Data Availability and Enhancing Climate Services”
III. What we can do FOR YOU
What we can do FOR YOU: Tailored Climate Information

From WHAT IS PROVIDED to WHAT YOU NEED
What we can do FOR YOU: Tailored Climate Information

Dynamical-statistical downscaling of seasonal prediction

Tailoring climate prediction

Super Computer

REAL LIFE

Detailing spatiotemporally

MORE DETAILS
What we can do FOR YOU: Tailored Climate Information

Dynamical-statistical downscaling of seasonal prediction

### What we can do FOR YOU:

- Tailored Climate Information

### 1) Get a hint for selecting potential predictors:

<table>
<thead>
<tr>
<th>Location</th>
<th>Precipitation</th>
<th>PROJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cook_Islands</td>
<td>91843</td>
<td>ASO</td>
</tr>
<tr>
<td>v850</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 2) Select your own potential predictor (PROJECT):

**ASO** Cook_Islands (91843) correlated onto v850

### Summary of APCC toySimulator results

The precipitation of Cook_Islands 91843 (ASO) is predicted to be 6.80692 mm/mon using 2 potential predictors:

- \( x_1 = \text{AREA}AV(	ext{prec} [175^\circ W-140^\circ W, 25^\circ S-15^\circ S]) \)
- \( x_2 = \text{PROJECT}(v850 [165^\circ E-130^\circ W, 40^\circ S-30^\circ N]) \)

Pseudo Jack–knife hindcast temporal correlation skill* is 0.12.

Bayesian probabilistic forecast shows that this ASO precipitation is...

- (+) 31.76%
- (0) 33.04%
- (-) 35.2%

*Note that these results are NOT actual prediction skill nor cross-validated.

### 3) These are the selected potential predictors:

- \( x_1 = \text{AREA}AV(	ext{prec} [175^\circ W-140^\circ W, 25^\circ S-15^\circ S]) \)
- \( x_2 = \text{PROJECT}(v850 [165^\circ E-130^\circ W, 40^\circ S-30^\circ N]) \)

### 4) Build your own statistical prediction model:

\[
y = \beta_0 + \beta_1 x_1 + \beta_2 x_2
\]

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**What we can do FOR YOU:** Tailored Climate Information

**Dynamical-statistical downscaling of seasonal prediction**

1. **CLIK-P “Prediction”**
   - Full MME data

2. **Monitoring and Analysis**

3. **CLIK-P “Downscaling”**
   - Downscaling User interface

4. **Integrated forecast system**

5. **Forecast guideline**
   - Localized forecast
   - Service to user
   - Extra Info

Project ROK-PI ClIPS
Climate service for agriculture

What we can do FOR YOU: Tailored Climate Information

Improving Agricultural Productivity through Ensuring Data Availability and Enhancing Climate Services

- Tonga Meteorological Agency
- Tonga Ministry of Agriculture
- Improved agricultural data management system
- Linked climate prediction and agricultural policy
- Aim to create decision support tool for farmers (this year)
What we can do FOR YOU: Tailored Climate Information

Climate service for agriculture

“Tonga Agro-met Service Project”

- Development of an agriculture database
- Generation of agro-met Information

Project Tonga
What we can do FOR YOU: Tailored Climate Information

Climate service for agriculture

“Tonga Agro-met Service Project”

1. **AGRO-SECTOR**  
   - **CAPACITY BUILDING**
     - Tonga NMS capacity
     - Agro-sector capacity

2. **CLIMATE SERVICES FOR AGRICULTURE**
   - Tonga Crop Model
   - Relative Yield

- Research on the core relationships between climate and agriculture through modelling and field trials
- Development of agro-met services (ToCSA)
What we can do FOR YOU: Tailored Climate Information

Climate service for agriculture

“Climate Service for Kiwifruit Orchards”

“Rice Disease Early Warning in the Philippines”

Weather Data (Climatology/ Seasonal Climate Forecast)
Crop Management Practices (Planting Calendar, Fertilizer Mgt, etc)
Crop Cultivar/Variety (Genetic Coefficients)
Soil Data (Physiochemical properties of soil by horizon)

DSSATv4.5
Simulates the growth and development of crops to predict the yield

Disease Component
Simulates the potential infection risk of a disease to predict the yield loss caused by the disease

Project Tonga
What we can do FOR YOU: Tailored Climate Information

International cooperation for Climate Smart Agriculture (CSA)

“WMO GFCS Initiative”

“WMO GFCS Initiative”

“WMO GFCS Initiative”

Ready
Seasonal forecasts

Set
Mid-Range forecasts

Go!
Short-Range forecasts

“APEC CSA Initiative”

Alternate wetting and drying

India: Weather-based insurance

Climate-Smart Villages (CSVs)

Scaling up
Policy
Private sector
Development initiatives

Climate-smart technologies
Index-based insurance
Climate information services
Local adaptation plans

Learning sites
Multiple partners

Reduces risk

Component of rice
1. mulch do, 5 reduction, ZNDC

Adopted as part of the domestic policy(20-20-20)

GIZ project, WB project, local governments

Before: Where does it work?

Reduce agriculture’s contribution to climate change
What we can do FOR YOU: Tailored Climate Information

We make climate information useful, tailored for you!
THANK YOU

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