



PROGRAMMING
Language



APCC software developed in **Ruby** helps nations fight climate disasters

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APEC Climate Center



Outline

- **About APEC Climate Center**
- **Climate Information Tool Kit (CLIK)**
- **Ruby in CLIK**
- **Impact and effect of developing in Ruby**
- **Intended end-usage**
- **Actual operation**
- **Deployment and future ambitions**

Mission of APEC Climate Center

- Facilitating the share of high-cost climate data and information to **minimize economic and human losses due to natural disasters**

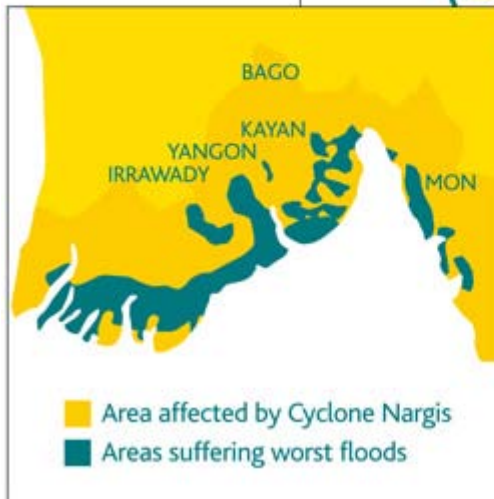
- **Capacity building** in climate prediction and sustainable **social and economic applications** of climate information

Disasters affect everyone

HOME
PAST EDITIONS
FEATURES
ARTS REVIEW

Myanmar cyclone worsens global food crisis

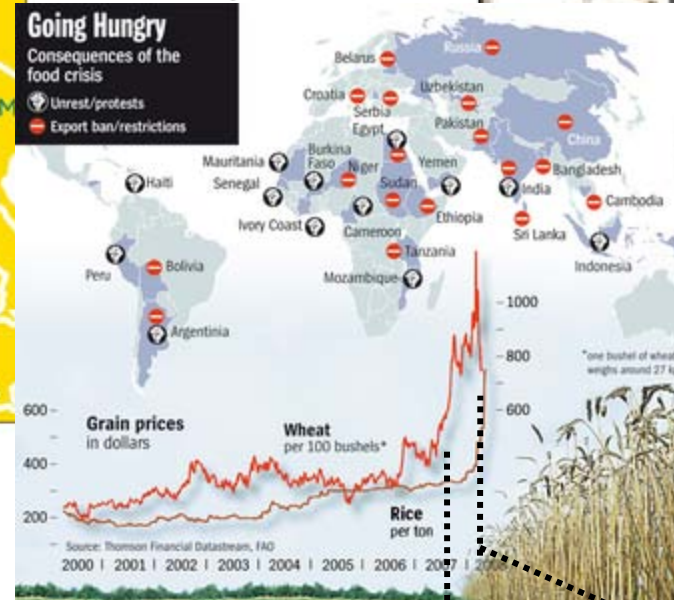
By Frank Stirk, BBC Correspondent



of southern Myanmar

Going Hungry
Consequences of the food crisis

- 🚧 Unrest/protests
- 🚫 Export ban/restrictions



in the cost of rice, a cyclone-ravaged adding to the growing : SALVATION ARMY

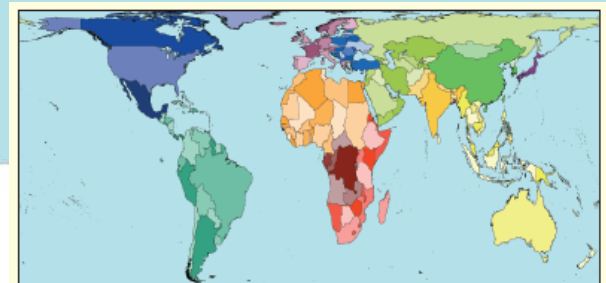
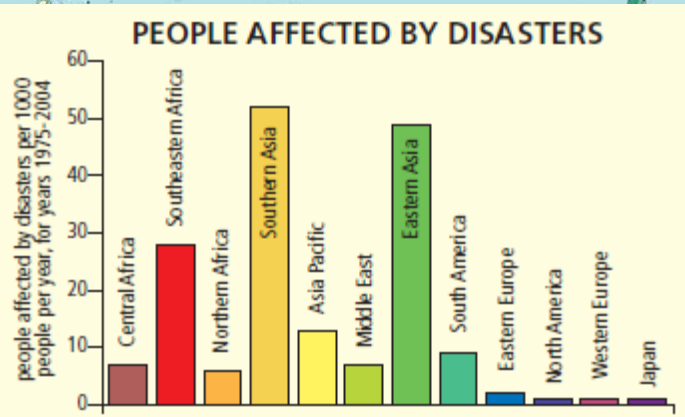
Nargis, 2008

Australian droughts 2006, 2007

Cartography of Disasters

Territory size = affected by disaster

Disasters mostly affect developing economies many of which have poor infrastructure for climate prediction



CLIK – a innovative tool for climate forecasters and decision makers

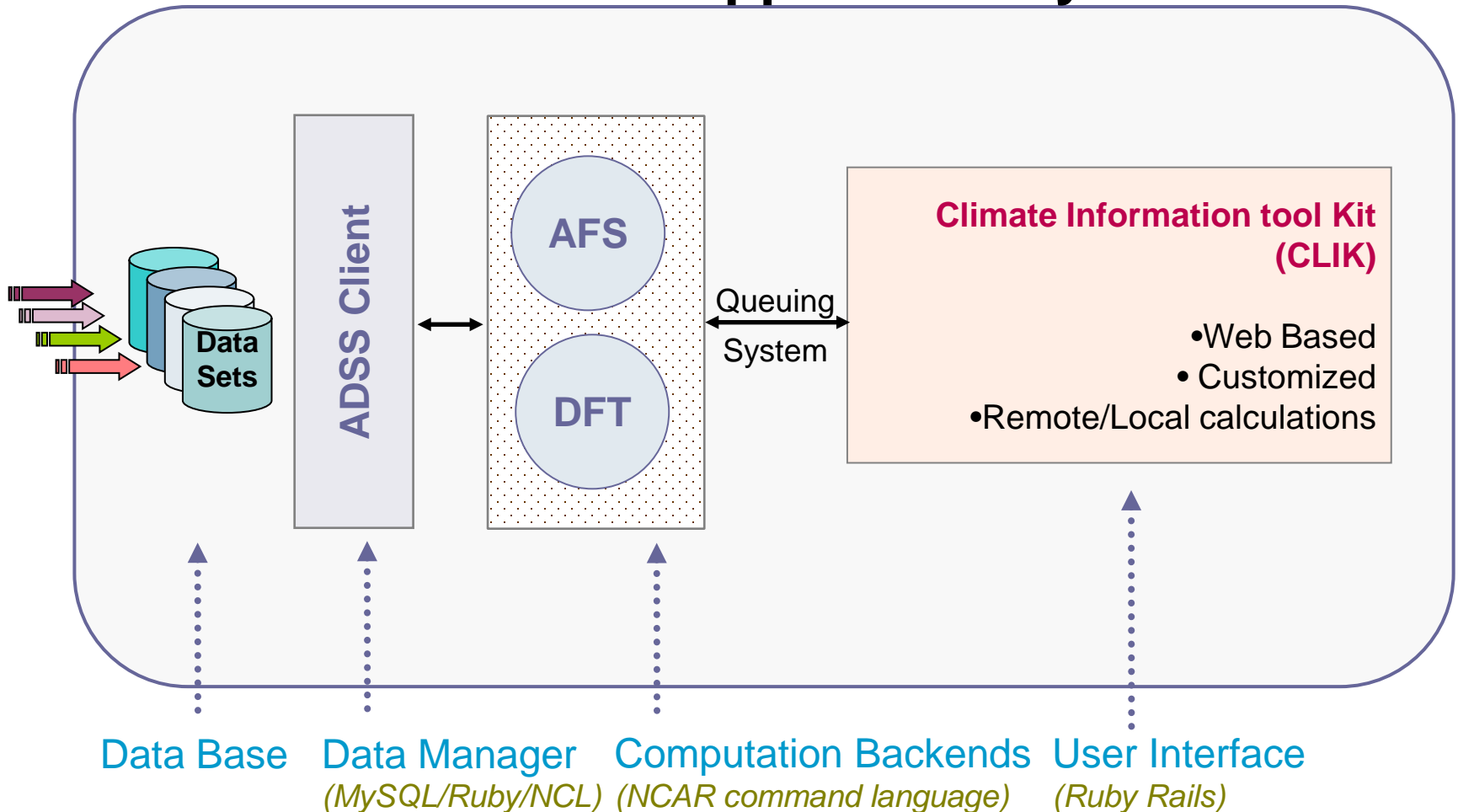
- Builds on international science and technology network co-ordinated by APEC Climate Center to :
 - deliver fruit of decades of research and technology to needed communities in the fight against climate related disasters
- Aid climate researchers to enhance scientific understanding of climate and its prediction
- Encourage innovation in applying climate information for societal needs

How CLIK aids climate forecasters and decision makers

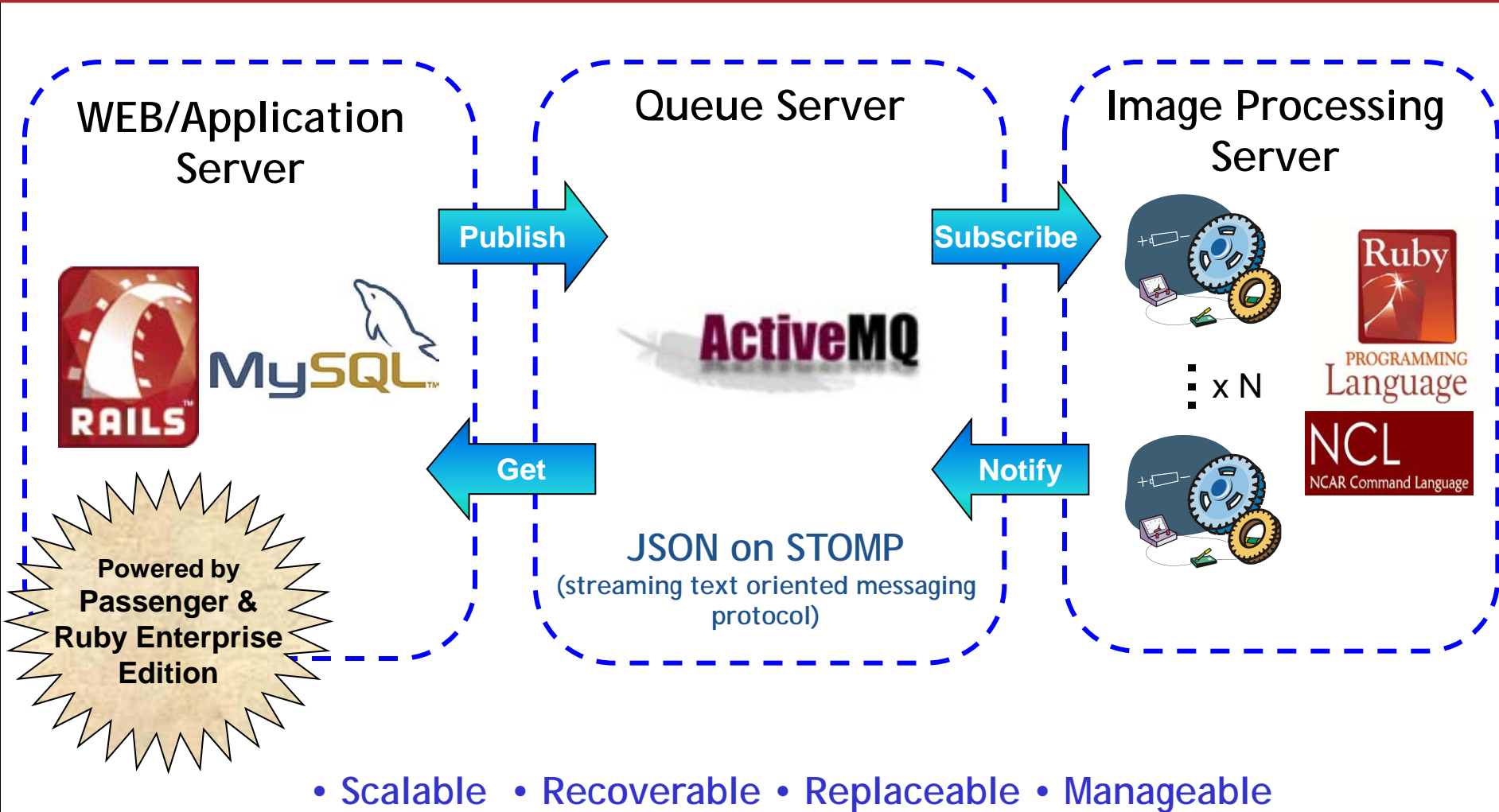
- Gives climate forecasters a user-friendly way to create a state-of-the-art forecast for their country
- Allows forecaster to experiment with various combinations to find the best forecast
- Will have large impacts on how climate forecasts are made in developing economies of the world (that lack modern climate prediction systems)

CLimate Information tool Kit (CLIK)

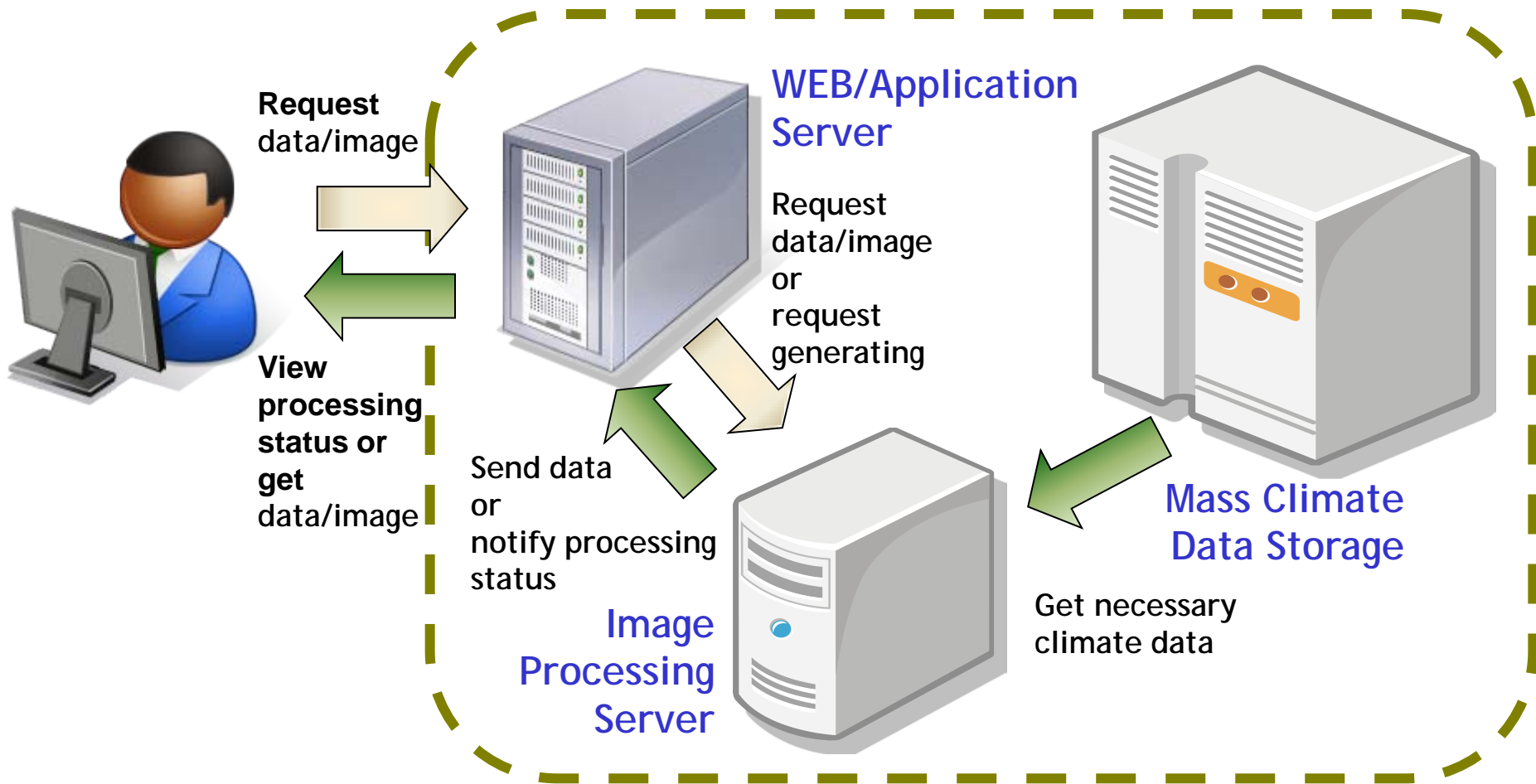
APCC Climate Application System



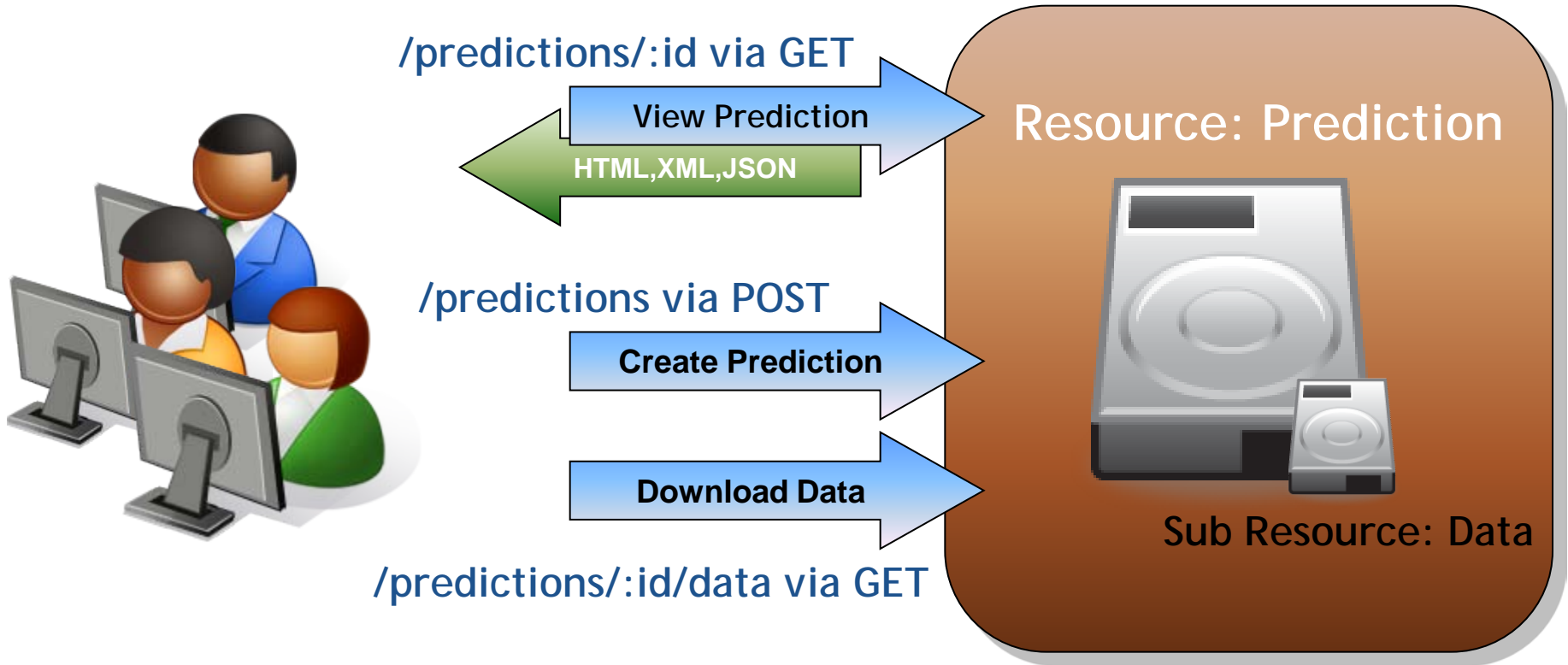
Architecture Overview



Image/Date Generating



RESTful Interface



Both of human (browser) and machines (program)
can access all resources on CLIK

Ruby in CLIK

- **Front End (Rails, YM4R)**
- **Back End (Ruby wrapper for NCL, RMagick)**
- **Data exchange (Drb based data exchange)**
- **Messaging (Stomp)**
- **Web-less usage (AFS, DEX)**

CLIK provides valuable climate prediction technology to developing nations

Available at <http://clik.apcc21.net>

**Customized
Multi-Model
Ensemble
Prediction**

The screenshot displays the CLIK web application interface. At the top, the CLIK logo is on the left, and navigation icons for Prediction, Downscale, Data Library, Jobs, and About are in the center. On the right, there are links for My Account and Logout, and a welcome message for a guest user.

The main interface is divided into several sections:

- When:** Year: 2008, Month: 12
- Providers:** A grid of checkboxes for various climate models: BCC, COLA, CWB, GCPS, GDAPS_F, HMC, IAP, IRI, JMA, METRI, MGO, MSC, NASA, NCEP, POAMA.
- Variables:** Checkboxes for PREC, T850, and Z500.
- Methods:** A dropdown menu currently set to SCM.

Below these sections are three buttons: Predict, Download, and Verify.

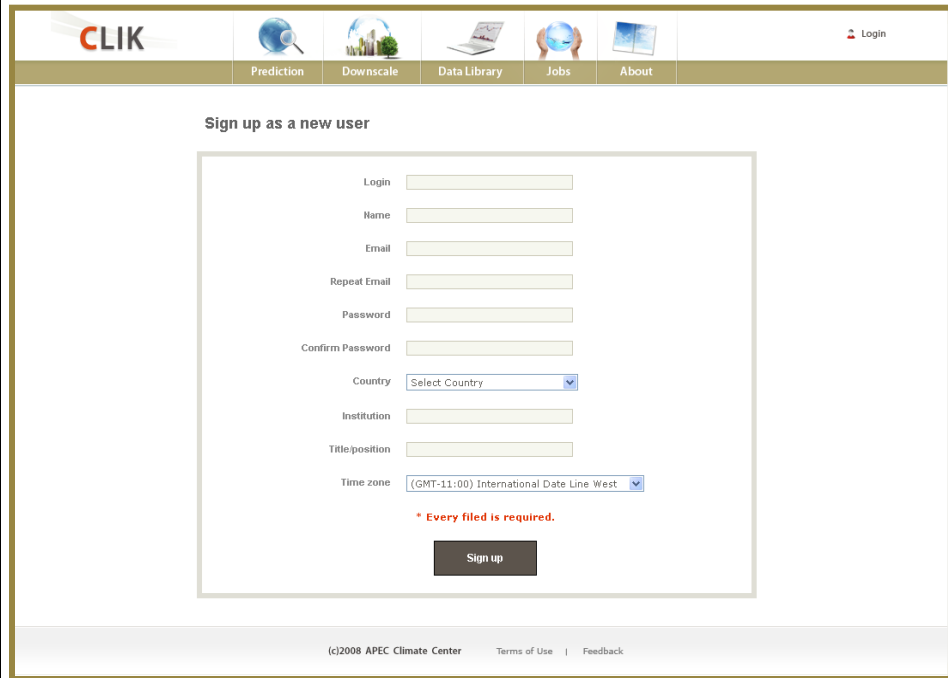
The central feature is a world map showing a climate prediction. The map is color-coded according to a legend at the bottom, ranging from -0.8 (dark blue) to 0.8 (dark red). The legend includes values: -0.8, -0.6, -0.4, -0.2, -0.1, 0, 0.1, 0.2, 0.4, 0.6, 0.8. The map shows a mix of colors, with cooler (blue) areas in the North Atlantic and warmer (red) areas in the Indian Ocean and parts of the South Atlantic. Country names are labeled in both English and their native languages (e.g., Russia, China, India, etc.).

At the bottom of the map, there is a Google logo and the text: "Map data ©2008 Europa Technologies, Copyright 2008 APCC - Terms of Use".

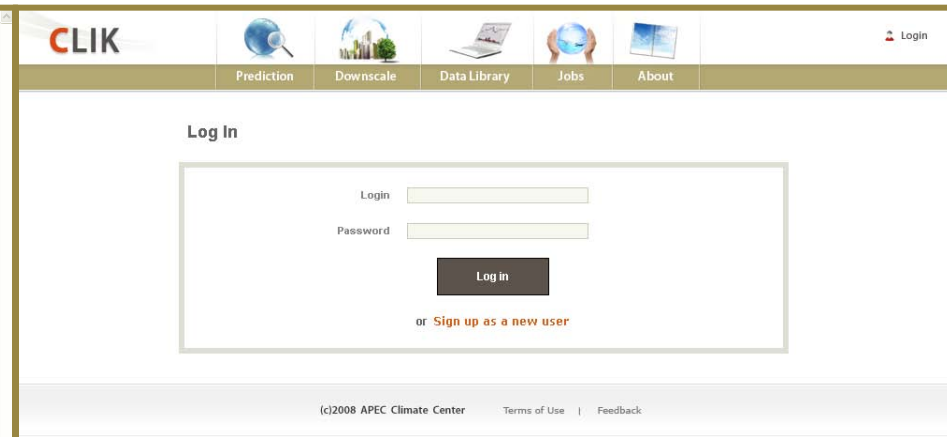
At the very bottom of the page, there is a footer with: "(c)2008 APEC Climate Center", "Terms of Use", and "Feedback".

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The screenshot shows the 'Sign up as a new user' page of the CLIK website. The page has a green header with the CLIK logo and navigation links: Prediction, Downscale, Data Library, Jobs, and About. A 'Login' link is also present in the top right. The main content area contains a registration form with the following fields: Login, Name, Email, Repeat Email, Password, Confirm Password, Country (a dropdown menu with 'Select Country' selected), Institution, Title/position, and Time zone (a dropdown menu with '(GMT-11:00) International Date Line West' selected). A red asterisk note states '* Every field is required.' Below the form is a 'Sign up' button. The footer contains the text '(c)2008 APEC Climate Center | Terms of Use | Feedback'.



The screenshot shows the 'Log In' page of the CLIK website. The page has a green header with the CLIK logo and navigation links: Prediction, Downscale, Data Library, Jobs, and About. A 'Login' link is also present in the top right. The main content area contains a login form with the following fields: Login and Password. Below the form is a 'Log in' button and a link that says 'or Sign up as a new user'. The footer contains the text '(c)2008 APEC Climate Center | Terms of Use | Feedback'.

Sign up as a new user & Log in

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List of the submitted job task

The screenshot shows the CLIK web application interface. At the top, there is a navigation bar with the CLIK logo and several menu items: Prediction, Downscale, Data Library, Jobs, and About. On the right side of the navigation bar, there are links for 'My Account' and 'Logout', and a 'Welcome! guest' message. Below the navigation bar, there is a main content area. On the left, there is a table listing submitted job tasks. On the right, there are two detail panels: 'JOB DETAIL' and 'PREDICTION DETAIL'. At the bottom of the page, there is a footer with copyright information and links for 'Terms of Use' and 'Feedback'.

JOB ID	PRED. ID	USER	STATE	CREATED	UPDATED	ACTION
117	105	jin-young	submitted	2009-01-22 01:02:32	2009-01-22 01:02:32	Detail
116	104	jin-young	finished	2009-01-21 03:44:09	2009-01-21 03:44:09	Detail
115	103	jin-young	finished	2009-01-21 00:47:50	2009-01-21 00:47:50	Detail
114	102	jin-young	finished	2009-01-21 00:47:37	2009-01-21 00:47:37	Detail

Total:120 Page1/12 | 1 2

JOB DETAIL

USER	117
STATE	submitted
USER	jin-young
CREATED AT	2009-01-22 01:02:32
UPDATED AT	2009-01-22 01:02:32

PREDICTION DETAIL

ID	105
PROVIDERS	0203040508101314
YEAR / MONTH	2007 / 1
VARIABLE	T850
METHOD	SCM






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Data Library for available models

CLIK

[My Account](#) [Logout](#)

Prediction
Downscale
Data Library
Jobs
About
Welcome! guest

Provider	Economy	Start Year	End Year	Variables	Model Designation	Ensemble
BCC	China	1983	2006	PREC T850 Z500	NCC CGCM T63L16	8
COLA	U.S.A.	1981	2008	T2M PREC MSLP T850 U850 V850 U200 V200 Z500 OLR	COLA AGCM v2.2.5 T63L18	10
CWB	Chinese Taipei	1979	2008	T2M PREC MSLP T850 U850 V850 U200 V200 Z500	CWB T42L18	10
GCPS	Republic of Korea	1979	2008	T2M PREC MSLP T850 U850 V850 U200 V200 Z500	GCPS T63T21	4
GDAPS_F	Repulic of Korea	1979	2008	T2M PREC MSLP T850 U850 V850 U200 V200 Z500	GDAPS T106L21	20

Total:120 Page1/12 | ◀ 1 2 ▶

Status of Update

recent update status of providers

- **Failure:**
COLA, JMA
- **Success:**
POAMA, NASA, BCC, GCPS

Update All

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CLIK version 2.0 (available in 2010) will provide

Will be available at <http://clik.apcc21.net>

Station-based Regional Climate Prediction

The screenshot displays the CLIK website interface. At the top, there is a navigation bar with the CLIK logo and icons for Prediction, Downscale, Data Library, Jobs, and About. A user account section shows 'My Account' and 'Logout' options. Below the navigation bar, the main content area is divided into two panels. The left panel, titled 'Interactive Regional Map', features a red arrow pointing right and a red arrow pointing left. It displays the title 'Olongapo City (2009JJA)' and its coordinates: Lat : 14° 51' 4" N, 14.8510° (decimal) and Lon : 120° 15' 58" E, 120.2662° (decimal). A 3D bar chart shows the percentage of precipitation and temperature anomalies. The chart has two groups of bars: one for Precipitation and one for Temperature. Each group has three bars: a red bar for 'Above', a grey bar for 'Normal', and a blue bar for 'Below'. The y-axis is labeled 'Percentile (%)' and ranges from 0 to 70. The x-axis is labeled 'Precipitation Temperature'. Below the chart, it states: '- Extreme Rainfall : Predicted' and '- Extreme Drought : None-Predicted'. There is also a small image of a typhoon and the text 'Usual Typhoon Activity'. The right panel shows a satellite map of the region, including parts of Vietnam, the Philippines, and the Spratly Islands. A red checkmark is visible over Olongapo City. The map includes navigation controls and a legend for 'Map', 'Satellite', 'Hybrid', and 'Forecast'. At the bottom of the page, there is a footer with the text '(c)2008 APEC Climate Center', 'Terms of Use', and 'Feedback'.

CLIK

Prediction Downscale Data Library Jobs About

My Account Logout

Welcome! guest

Interactive Regional Map

- **Olongapo City (2009JJA)**
 - Lat : 14° 51' 4" N, 14.8510° (decimal)
 - Lon : 120° 15' 58" E, 120.2662° (decimal)

■ Above
■ Normal
■ Below

Percentile (%)

Precipitation Temperature

- Extreme Rainfall : Predicted
- Extreme Drought : None-Predicted

Usual Typhoon Activity

Map Satellite Hybrid Forecast

POWERED BY Google
Imagery ©2008 TerraMetrics, Map data ©2008 Tele Atlas, AND: MapIT, NFGIS, Europa Technologies - Terms of Use

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APCC Ruby Projects



2008

CLiK - Climate Information Tool Kit



2009

ADePt - Asia Pacific Data Exchange Portal



2010

ViCOM - Virtual Community

Further Information

CLIK online service available from
<http://clik.apcc21.net>

Project Management Page
<http://210.98.49.69:8001/projects/show/clik>

e-mail: clik@apcc21.net
saji@apcc21.net



Thank You!
ご清聴ありがとうございました!