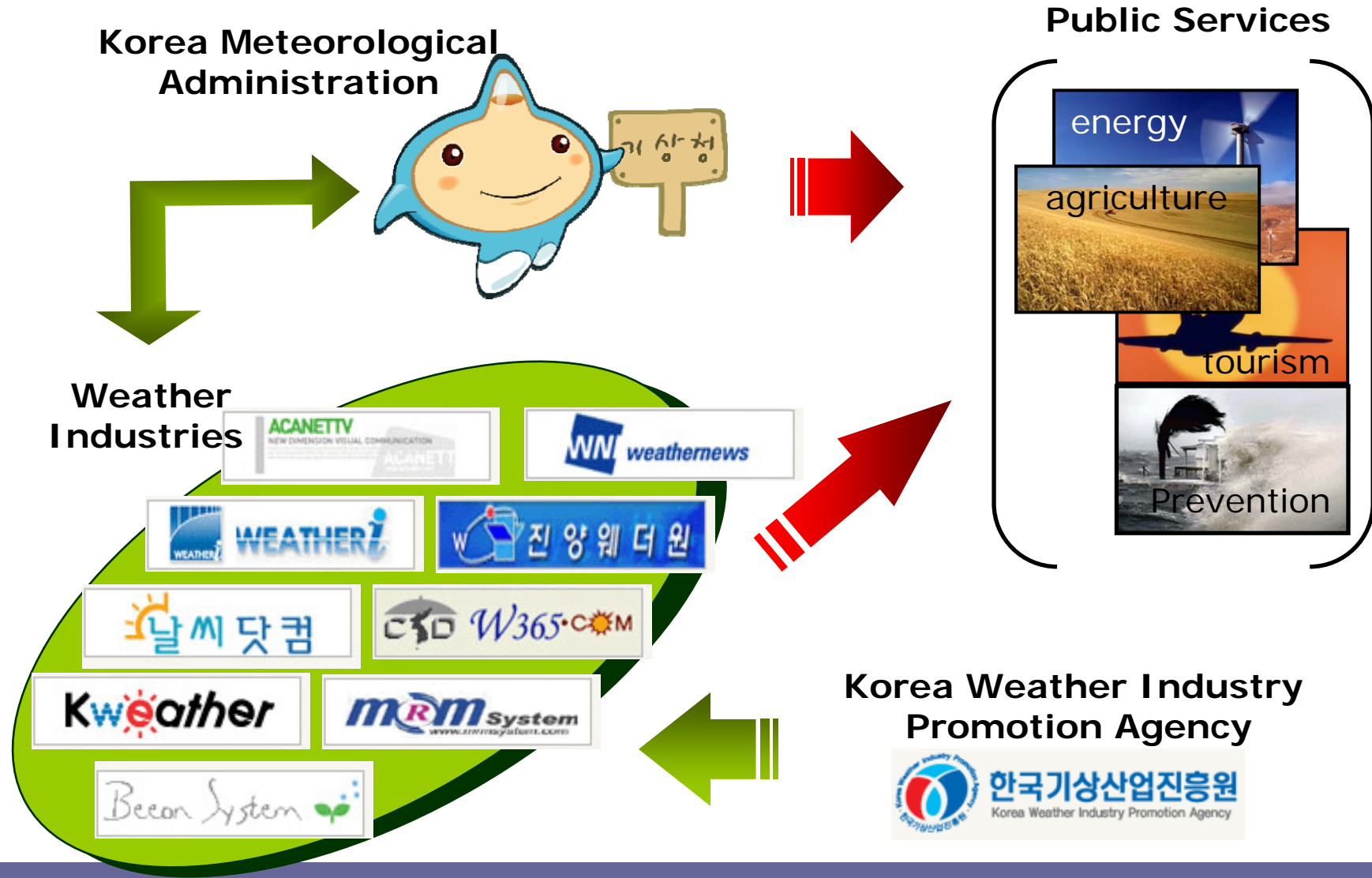# Application of Climate Information in KMA

Korea Meteorological Administration

Climate Prediction Division

Hyun-kyung Kim

Application of Climate Information

Korea Meteorological Administration

Public Services

energy

agriculture

tourism

Prevention

Weather Industries

Korea Weather Industry Promotion Agency

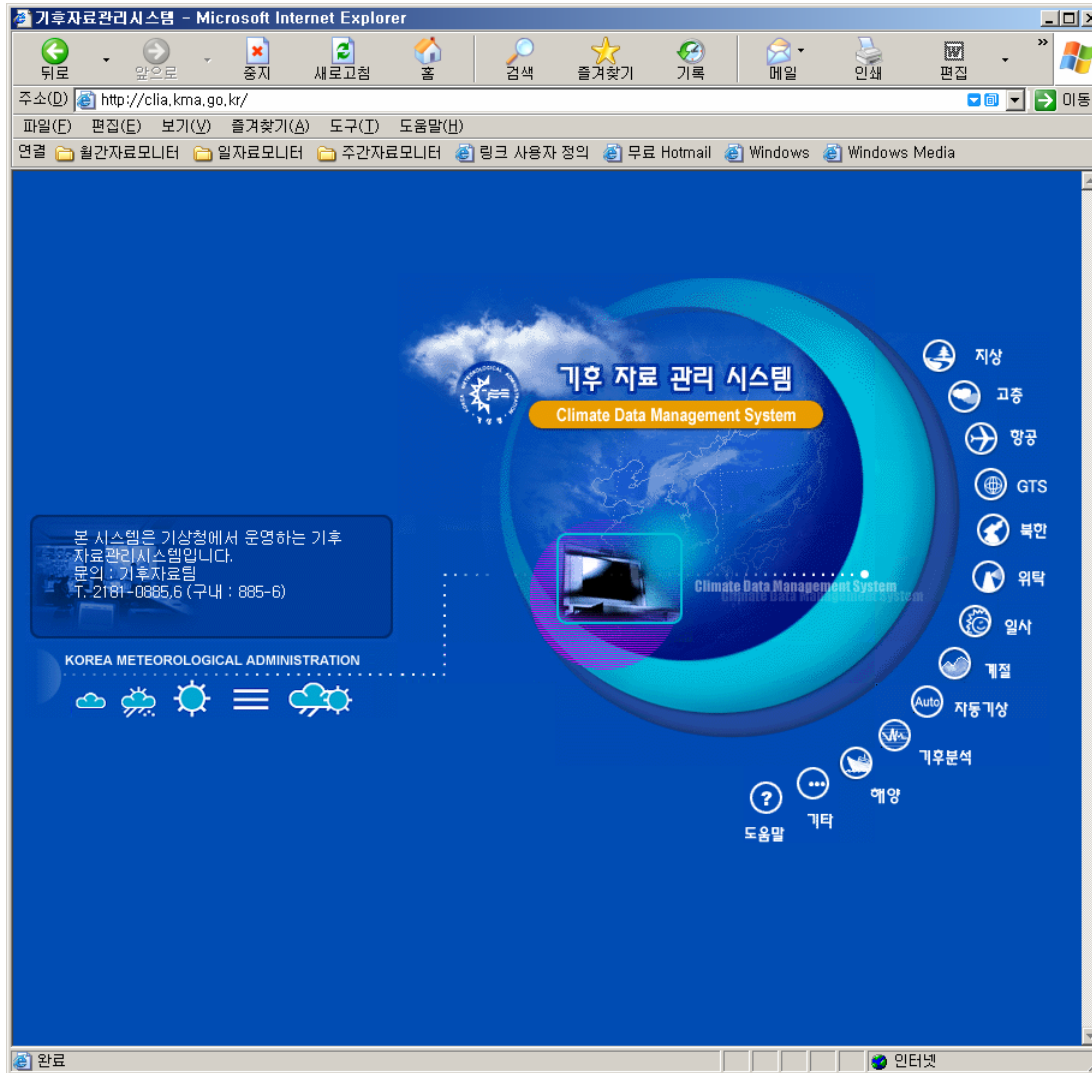# Contents

Public service from KMA (climate information)

— Climate Data

— Long Range Forecast (LRF)

— Industrial Meteorology Information

Weather Industries

Organization of Climate Bureau in KMA

Climate Bureau

- Climate Policy Division
- Climate Prediction Division
- Meteorological Industry Promotion Division
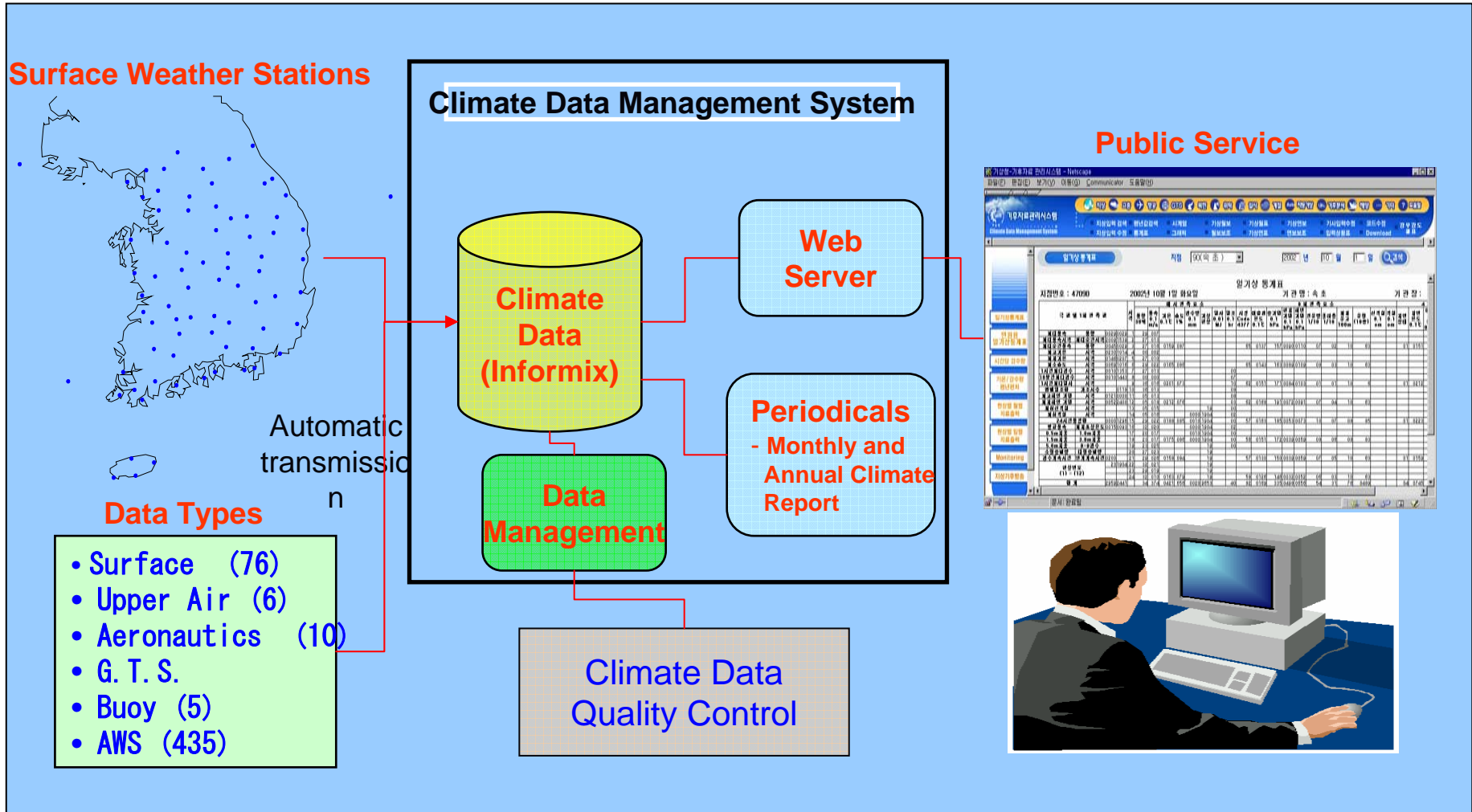- Climate Data Team
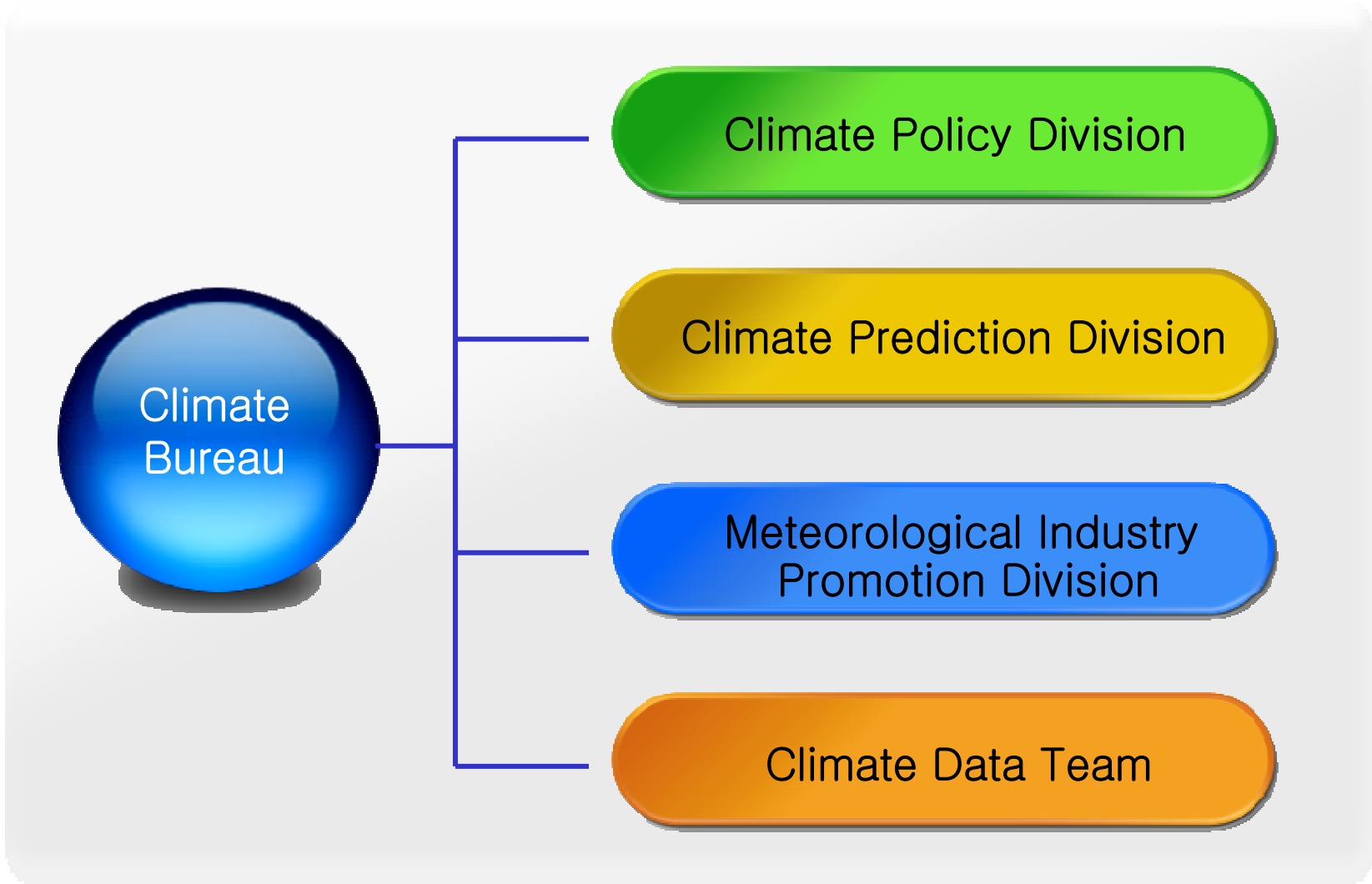
Climate Data Management System

- Historical data set over Korea through web service
  - daily and monthly data
  - climatology (1971-2000)
- Web site: www.clia.kma.go.kr (Korean only)
- Easy access of weather & climate data to the public

Climate Data Management System

Surface Weather Stations

Climate Data Management System

Public Service

Automatic transmission

Data Types

- Surface (76)
- Upper Air (6)
- Aeronautics (10)
- G.T.S.
- Buoy (5)
- AWS (435)

Climate Data (Informix)

Web Server

Periodicals
- Monthly and Annual Climate Report

Data Management

Climate Data Quality Control

LRF products at KMA

	1-month fcst.	3-month fcst.	6-month fcst.
Issue date	3rd , 13th, and 23rd day of each month	23rd day of each month	23rd day of May and Nov. (twice a year)
Contents	· 10-day mean temperature and precipitation · 30-day mean temperature and precipitation	· 1-month mean temperature and precipitation · 3-month mean temperature and precipitation *1Asian dust outlook *2Typhoon outlook *3Changma outlook	· 1-month mean temperature and precipitation (Jun. to Nov./Dec. to May)
Forecast type	Three type categories : above, below and near normal The anomalies are based on model climatologies obtained from a 28 year database(1979 to 2006).		

*1 *Asian dust outlook* is issued in late February including frequency and density of Asian dust expected to affect Korea for the upcoming Spring.

*2 *Typhoon outlook* is issued in late May and Aug regarding number of Typhoon expected to affect Korea for the upcoming Summer and Fall.

*3 *Changma outlook* is issued in late May regarding duration and intensity of Changma .

Numerical Models for LRF

		GDAPS (Operational)
Resolution		T106L21
Major Physics	Convection	Kuo(1974)
	Large scale condensation	Kanamitsu et al.(1983)
	Radiation	Lacis & Hansen(1974) for SW Roger & Walshaw(1966)…for LW
	PBL	Meller-Yamada(1982)
	Land surface	SiB(simple biosphere)
SST (B.C.)		Observed & Forecasted SSTs
Dynamics		1.Three-dimensional global spectral model with hydrostatic primitive equations 2. Hybrid sigma-pressure coordinate 3. Semi-implicit method

Hindcast runs for Model Climatology (SMIP2/HFP)

Purpose	One-month & 3-month Forecasts
Period	1979~2006 (28years)
Ensemble members	20 members: 3rd~7th day of each month (00, 06,12,18UTC)
Atmospheric Initial Condition	NCEP Reanalysis
SST	Observed & Forecasted SSTs
Boundary Condition	Climatology
Integration time	160 days

Computing Facility in KMA (Since 2005)

Cray X1E

CRAY X1E-3/192-L	
# of Cabinets	8
# of Nodes	256
Processor	1024 MSPs
Memory	4.096 TBytes
Peak Performance	18.5 TFlops
Single CPU Performance	18.08 GFlops
Direct Attached Storage	62 TBytes
SAN Disk	20 TBytes

Multi-Model Ensemble for 3-month forecast

- For seasonal forecasts (MAM, JJA, SON, DJF)

  — APCC's official MMEs

    : 15 models from 8 countries

- For other months

  — MMEs with 4 sets of models

    : GDAPS with Forecasted SST

    : GDAPS with Observed SST

    : GCPS (SNU GCM) with Forecasted SST

    : METRI GCM with Observed SST

http://apcc21.net
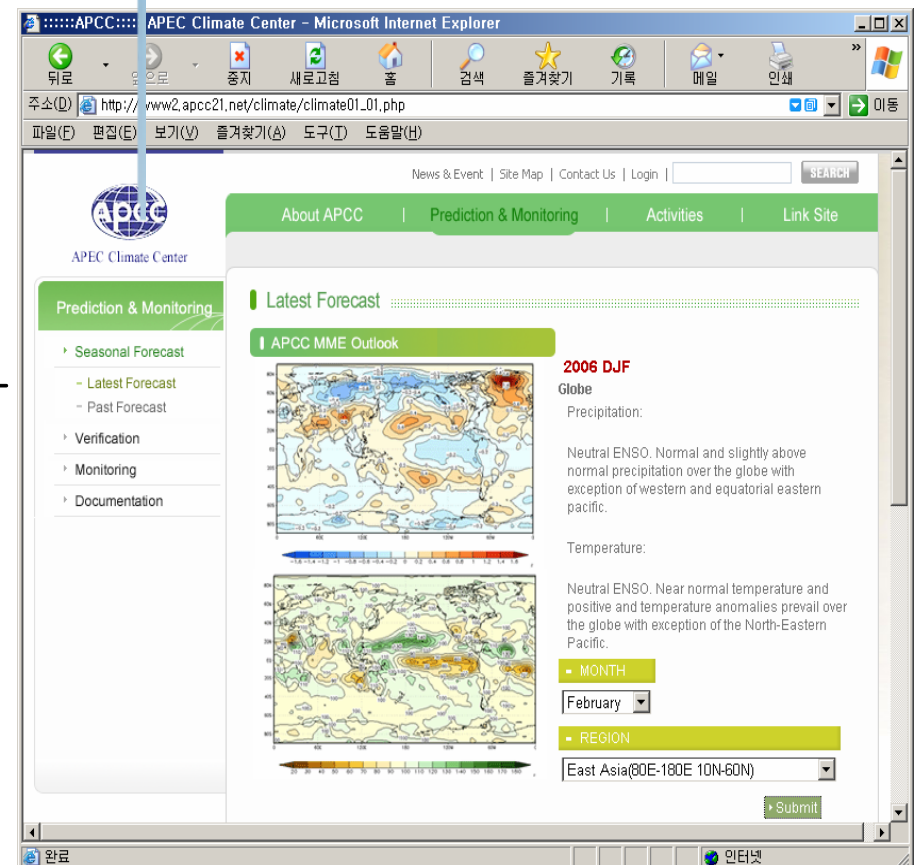
Quarterly Meeting for "El Nino related disaster relief"

- To provide LRF and recent climate & trend review, and
  El Nino/La Nina information etc.

- To discuss the countermeasure against possible climate related disasters

Government Agencies	Industries

Official LRF (KMA Website, Korean)

For the Public

• Through Web Site

• Press conferences
(4 times a year for each season)

• Special reports on demand

1-month fcst.

3-month fcst.

6-month fcst.

LRF Model products (KMA Website, English)

http://web.kma.go.kr/eng/lrwp/m3m_01.jsp

Industrial Meteorology Information Hub

http://industry.kma.go.kr/index.htm
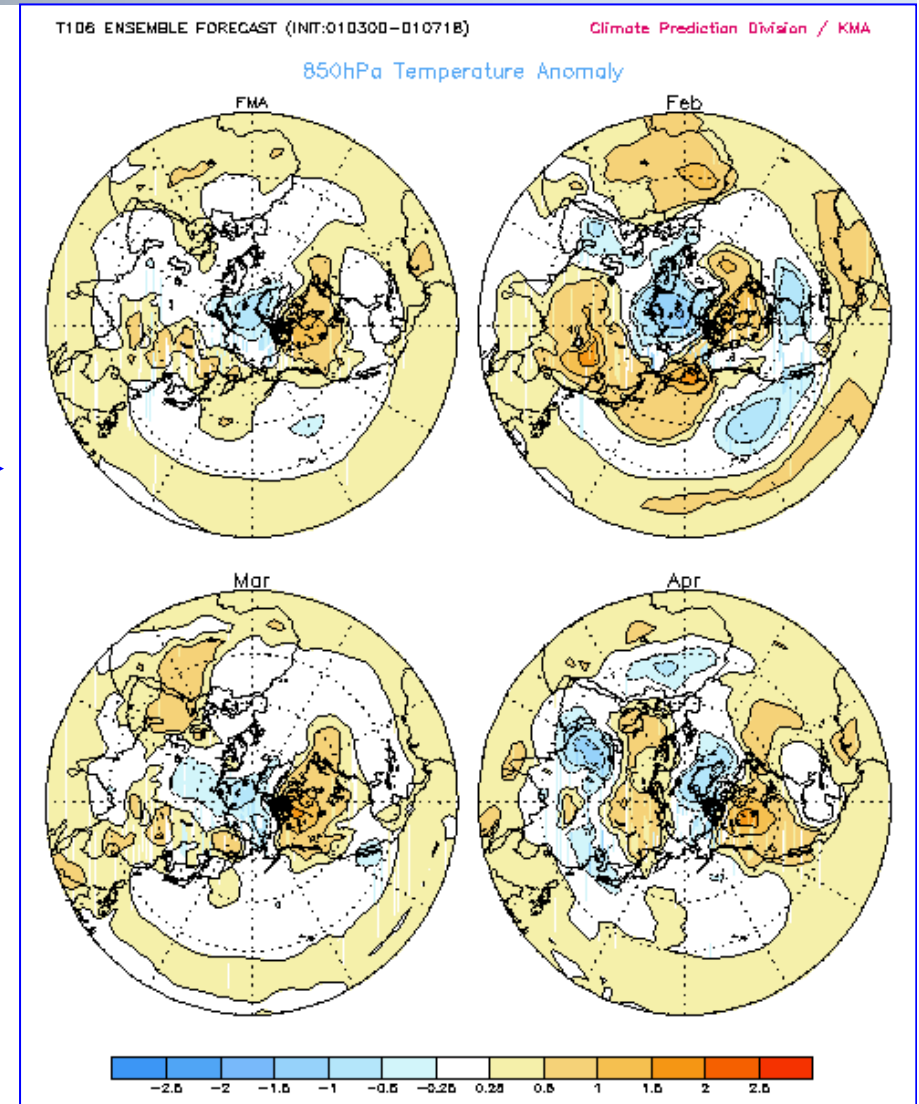
For Industry

Agriculture

Fisheries

Livestock Industry

Construction Industry

Energy sector

Leisure Industry

Transportation

Communication

Industrial Meteorology Information Hub
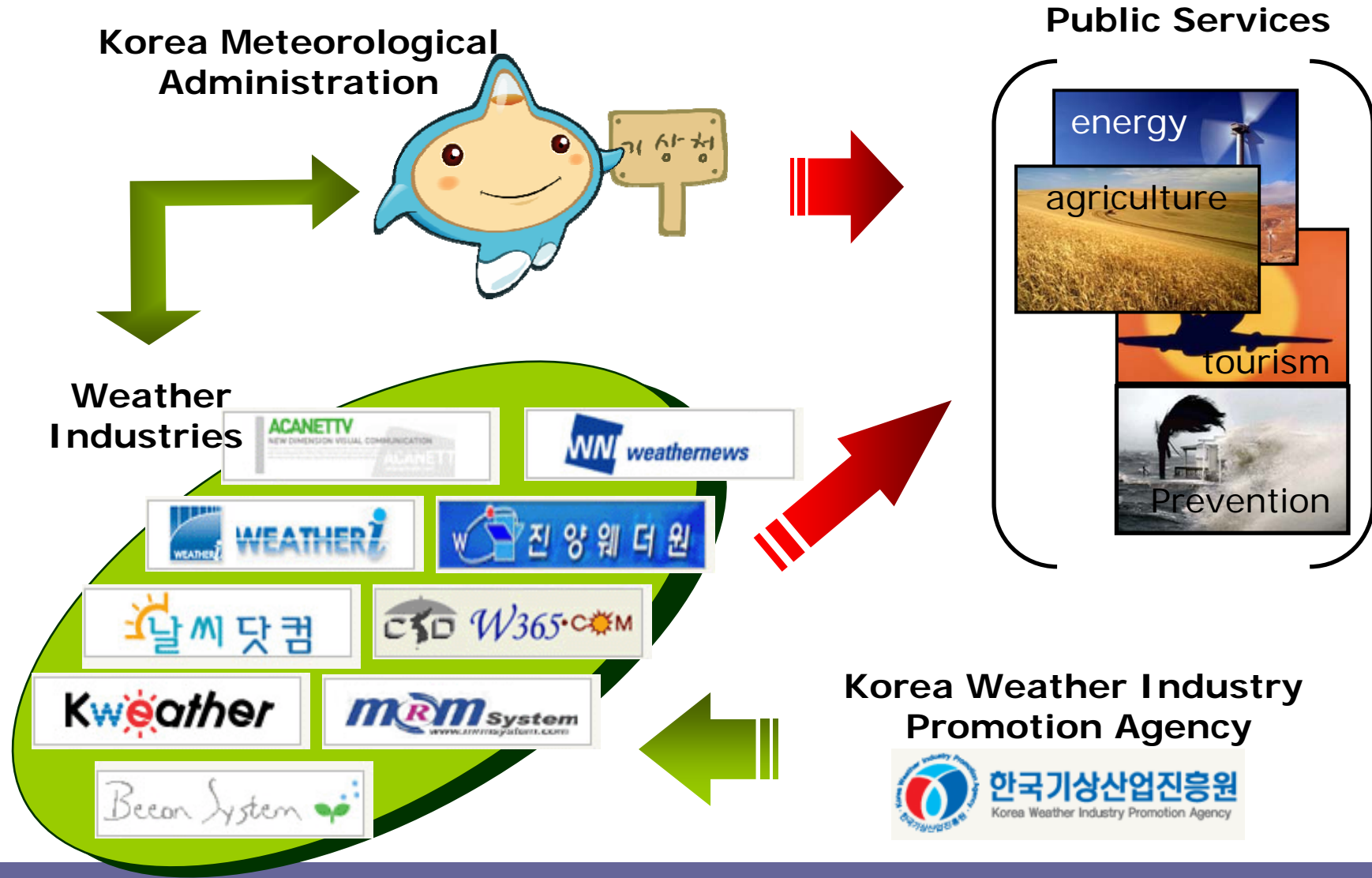
http://industry.kma.go.kr/index.htm

For Public

Health(7)
• Deterioration Index
• Discomfort Index
• Food Poisoning Index
• Heat Wave Index
• Windchill Temperature
• UV Index
• Air Pollution Meteo. Index

Energy(2)
• Heating Degree Day
• Freezing Burst Index

Fire(2)
• Forecast-Fire Potential
• Effective Humidity

Summary

Korea Meteorological Administration

Public Services

energy

agriculture

tourism

Prevention

Weather Industries

Korea Weather Industry Promotion Agency

Korea Weather Industry Promotion Agency (KWIPA)

http://www.weather.or.kr/

Role of KWIPA

• To promote economic growth of Weather Industries

– Total revenue of Weather industries

  : 1/4 of Canada, 1/5 of Japan, & 1/10 of USA

Thanks !