WMO-UNESCO SIDE EVENT AT COP 15

UN SYSTEM DELIVERING AS ONE ON CLIMATE KNOWLEDGE

Observation, monitoring and prediction: Essential elements of climate knowledge

Observation, monitoring and prediction: Essential elements of climate knowledge

- **Opening remarks: The outcome of World Climate Conference-3 (John Zillman)**
- **The importance of systematic observations and data in supporting climate services for adaptation (John Zillman)**
- **Accomplishments and challenges in global climate monitoring (Thomas Peterson)**
- **Delivering climate services for adaptation and mitigation (Julia Slingo)**
- **Information and communication technologies (ICT) role in climate monitoring (Malcolm Johnson)**
- **Building and maintaining an interdisciplinary climate knowledge base (Patricio Bernal)**
- **Discussion, wrap-up and closing remarks**

The Outcome of World Climate Conference-3 (WCC-3)

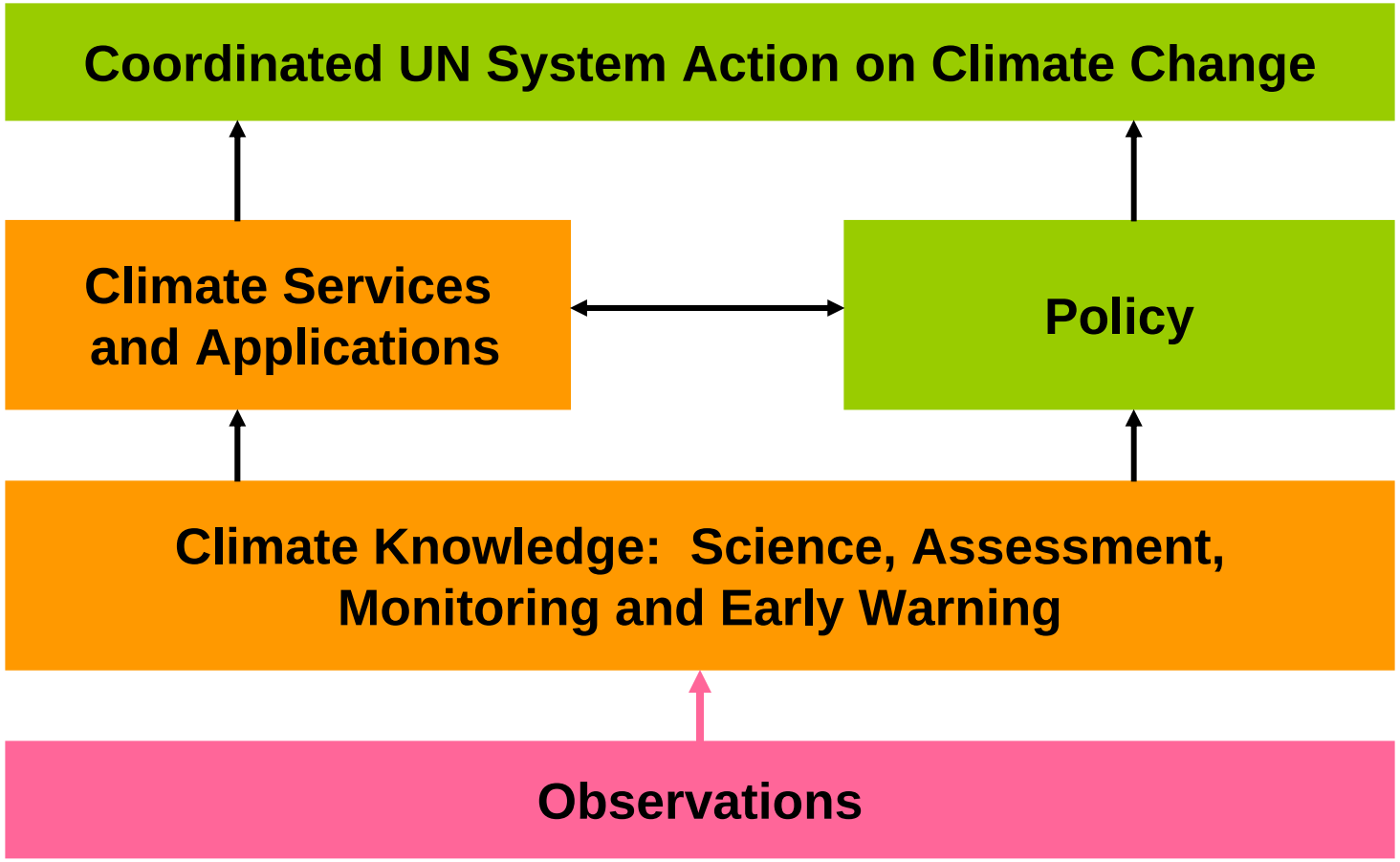
- Climate knowledge supporting coordinated UN System action on climate change
- The achievements of WCC-1 and WCC-2
- The outcome of WCC-3: Towards a GFCS
- The essential elements of a GFCS
- Putting the essential elements together
- A Global Framework for Climate Services

World Meteorological Organization
Weather • Climate • Water

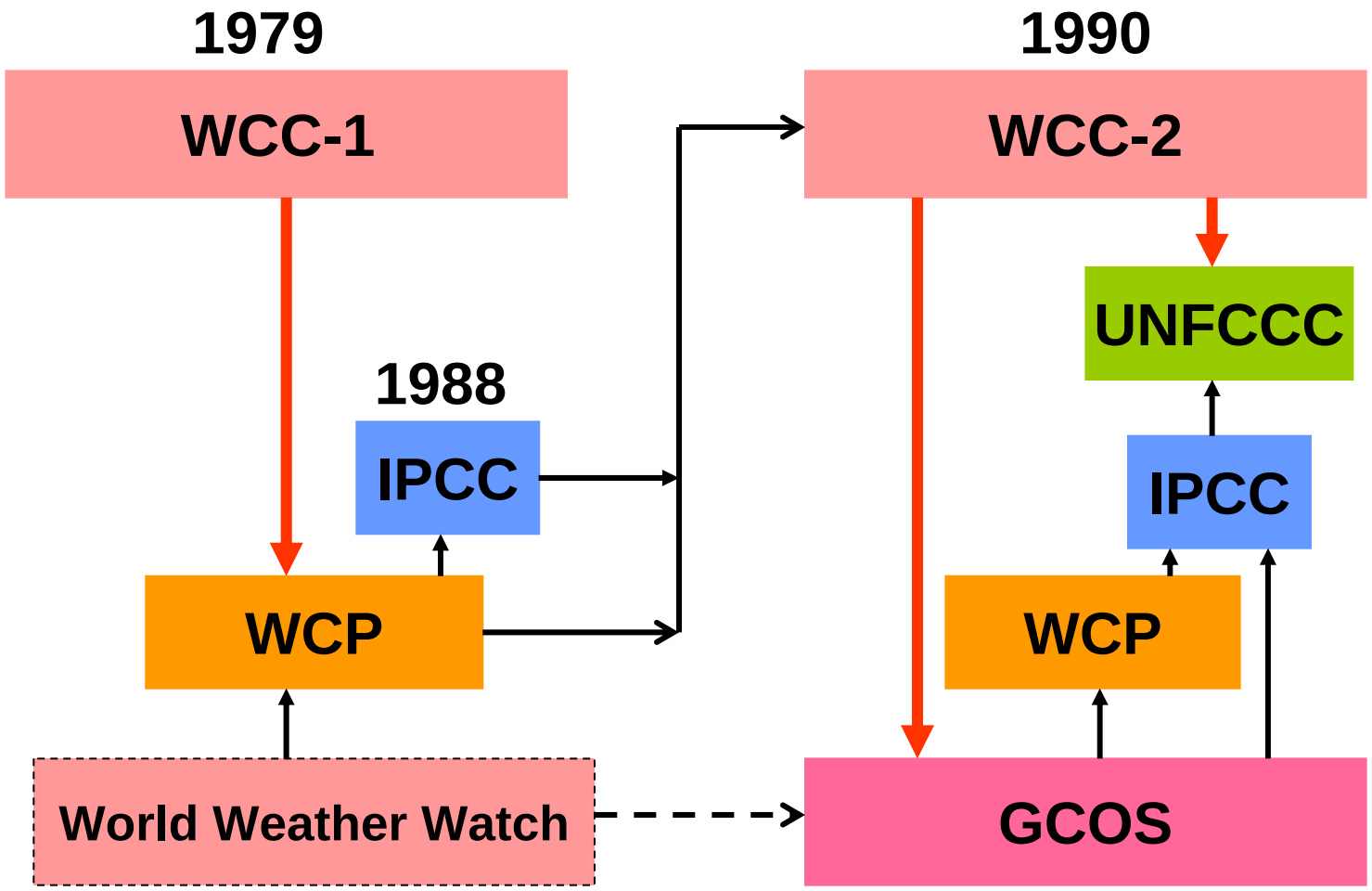
WORLD CLIMATE CONFERENCE-3

UN SYSTEM
DELIVERING AS ONE ON
CLIMATE KNOWLEDGE

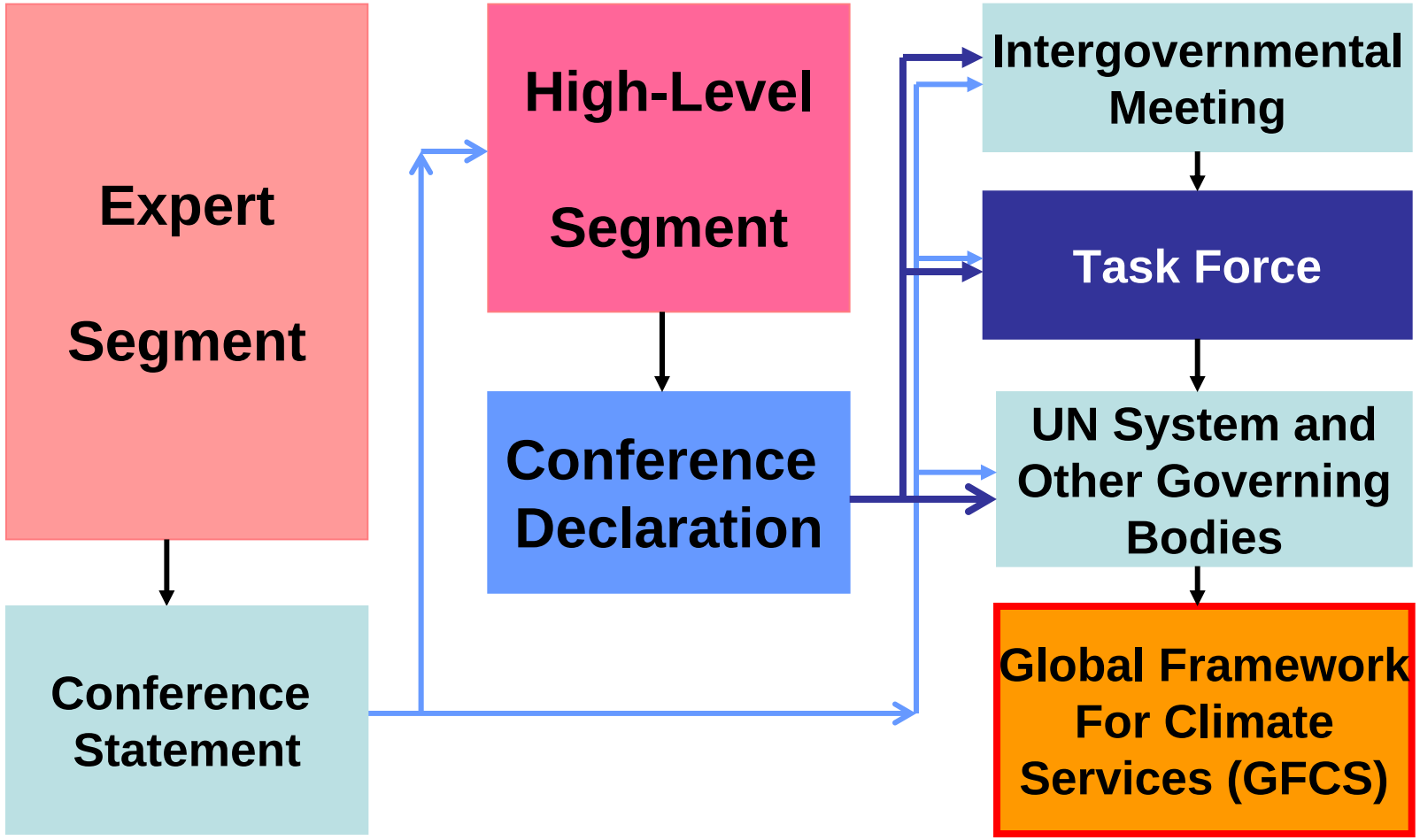
Climate Knowledge Supporting Coordinated UN System Action on Climate Change



The Achievements of the First and Second World Climate Conferences



The Outcome of WCC-3: Towards A Global Framework for Climate Services

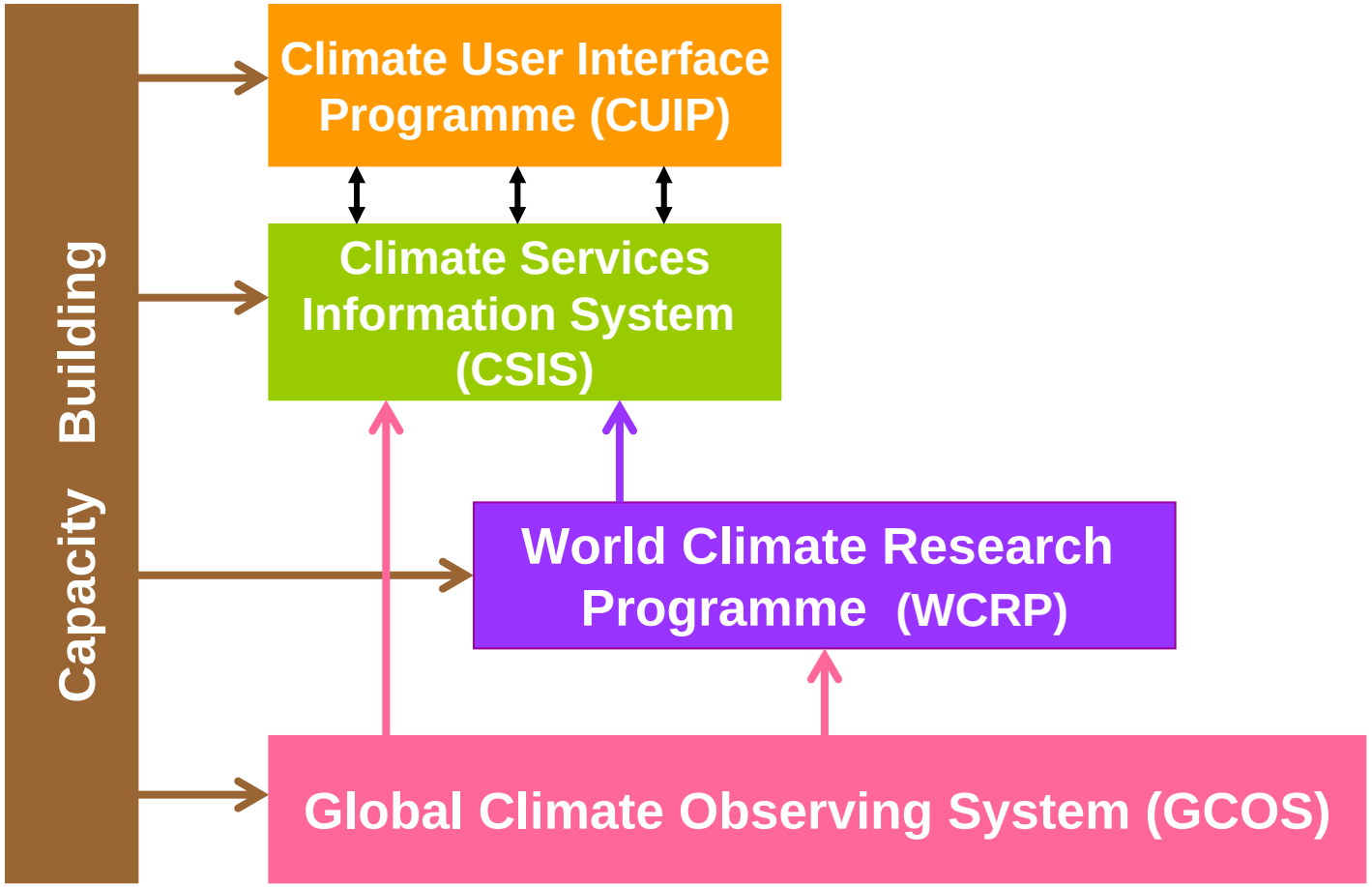


The Essential Elements of a Global Framework for Climate Services (GFCS)

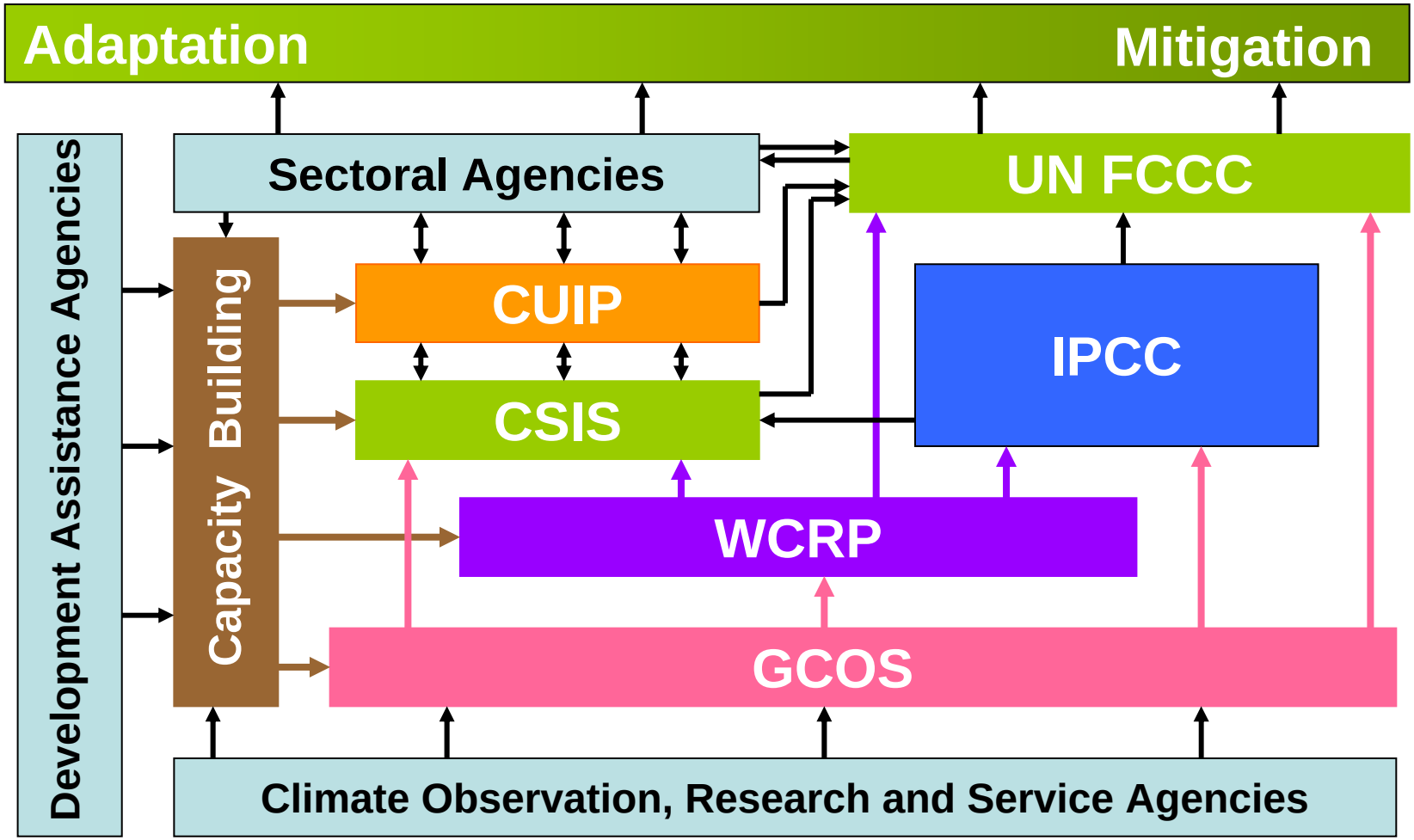
(WCC-3 Conference Statement)

- **The Global Climate Observing System and all its components and associated activities…….**
- **The World Climate Research Programme, under-pinned by adequate computing resources……..**
- **Climate services information systems taking advantage of enhanced existing national and international climate service arrangements…….**
- **Climate user interface mechanisms that are focused on building linkages…between the providers and users…..**
- **Capacity building through education, training and strengthening outreach and communication**

Putting the Essential Elements Together



A Global Framework for Climate Services (GFCS)



So let us look

now at the observation

element and GCOS

WMO-UNESCO SIDE EVENT AT COP 15

UN SYSTEM DELIVERING AS ONE ON CLIMATE KNOWLEDGE

The Importance of Systematic Observations and Data in Supporting Climate Services for Adaptation

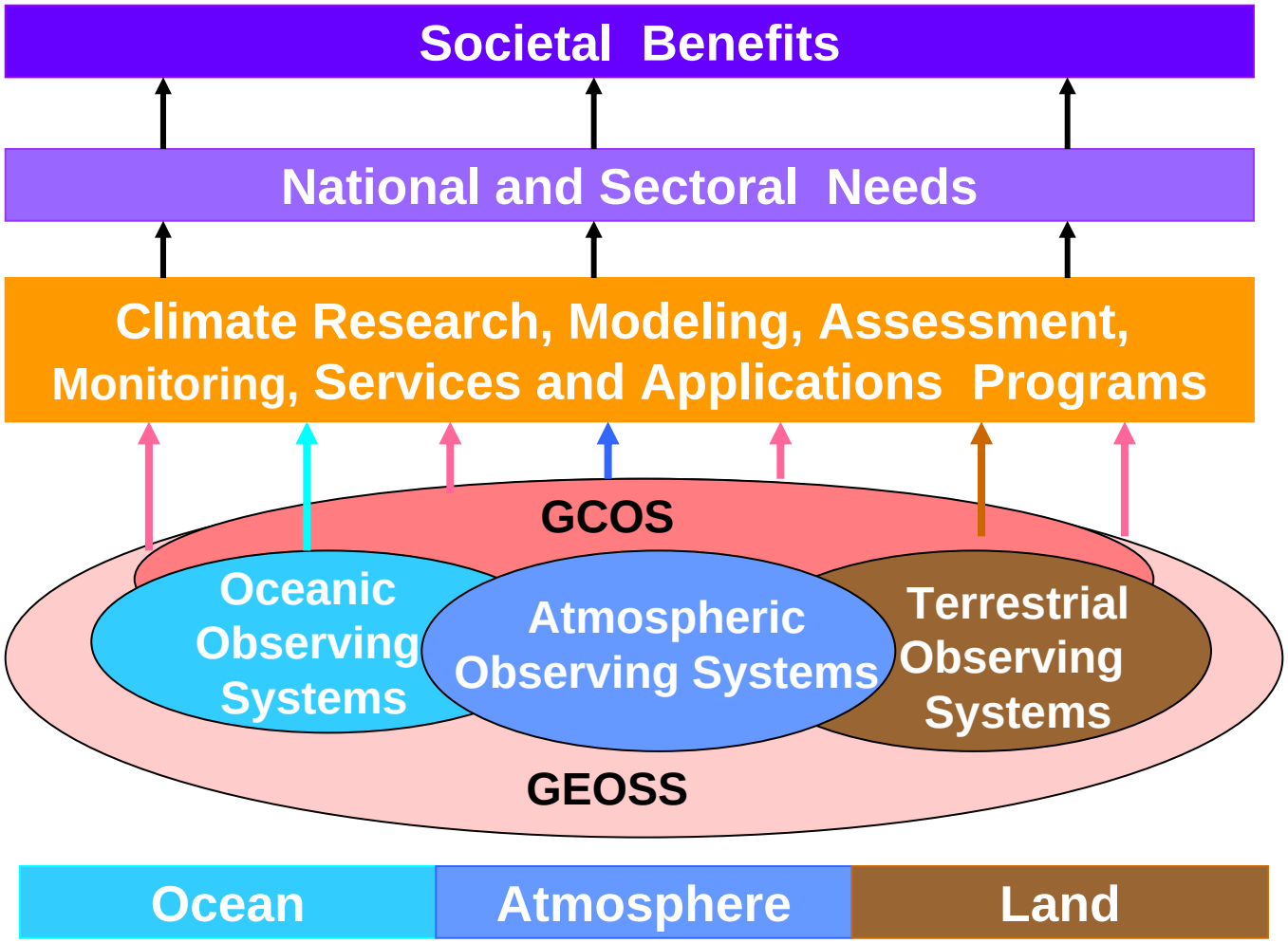
John W Zillman

- National and sectoral needs for climate observations
- The basic concept of the Global Climate Observing System (GCOS)
- Climate-sensitive sectors needing climate observations
- Essential Climate Variables
- UN System and ICSU-sponsored Global Observing Systems working together through GCOS
- Guiding the implementation of GCOS in support of climate services
- GCOS Agents for Implementation
- An integrated Global Climate Observing System

National and Sectoral Needs for Climate Observations

- **Research** aimed at understanding of climate including study of the impacts of climate change
- **Modeling** of the climate system for prediction and projection
- **Assessment** of the state of knowledge of anthropogenic climate change
- **Monitoring** of the climate system including climate change detection and attribution
- **Services:** Observational and data support for the provision and use of all types of climate services (information, prediction, projection, advice,……)
  - to all sectors
  - in all countries
  - for all purpose (planning, social/economic development, mitigation, adaptation …….)
- **Policy** development for climate change **mitigation** and **adaptation**

The Basic Concept of the Global Climate Observing System (GCOS)



Climate-sensitive Sectors Needing Climate Observations

- Agriculture and food
- Biodiversity and NRM
- Disaster risk reduction
- Education
- Energy
- Environment
- Forestry and fisheries
- Health
- Human settlements
- Industry
- Transport
- Tourism
- Water
- Oceans and coasts

Essential Climate Variables (ECVs)

OCEANIC

Surface (9)

- Sea surface temperature
- Sea surface salinity
- Sea level
- Sea state
- Sea ice
- Surface current
- Ocean colour
- Carbon dioxide partial pressure
- Ocean acidity

Sub-surface (10)

- Temperature
- Salinity
- Current
- Nutrients
- Carbon dioxide partial pressure
- Ocean Acidity
- Oxygen
- Tracers
- Photoplankton
- Marine biodiversity and habitat

ATMOSPHERIC

Composition (3)

- Carbon dioxide
- Methane and other LL GHGs
- Ozone and aerosols

Upper Air (5)

- Temperature
- Wind speed and direction
- Water vapour
- Cloud properties
- Earth radiation budget

Surface (6)

- Air temperature
- Wind speed and direction
- Water vapour
- Pressure
- Precipitation
- Surface radiation budget

TERRESTRIAL

Biological/Ecological (7)

- Land cover
- fAPAR
- Leaf Area Index
- Above ground biomass
- Soil carbon
- Fire disturbance
- Terrestrial biodiversity/habitat

Hydrological (5)

- River discharge
- Water use
- Ground water
- Lakes
- Soil moisture

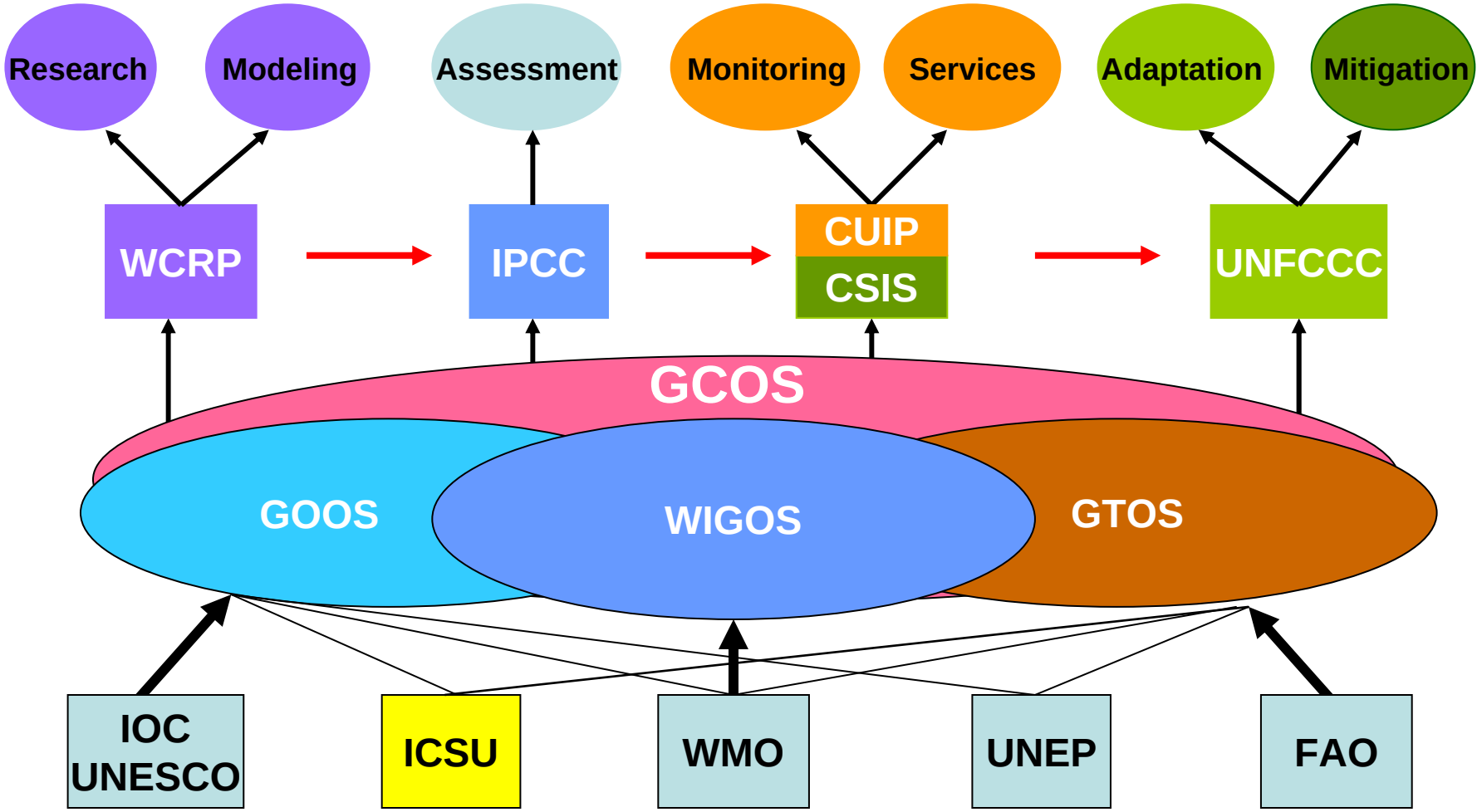
Cryospheric (4)

- Snow cover
- Glaciers and ice caps
- Ice sheets
- Perma frost

Other (1)

- Albedo

UN System and ICSU–sponsored Global Observing Systems Working Together through GCOS to support International Climate Programs & Mechanisms serving Community Needs



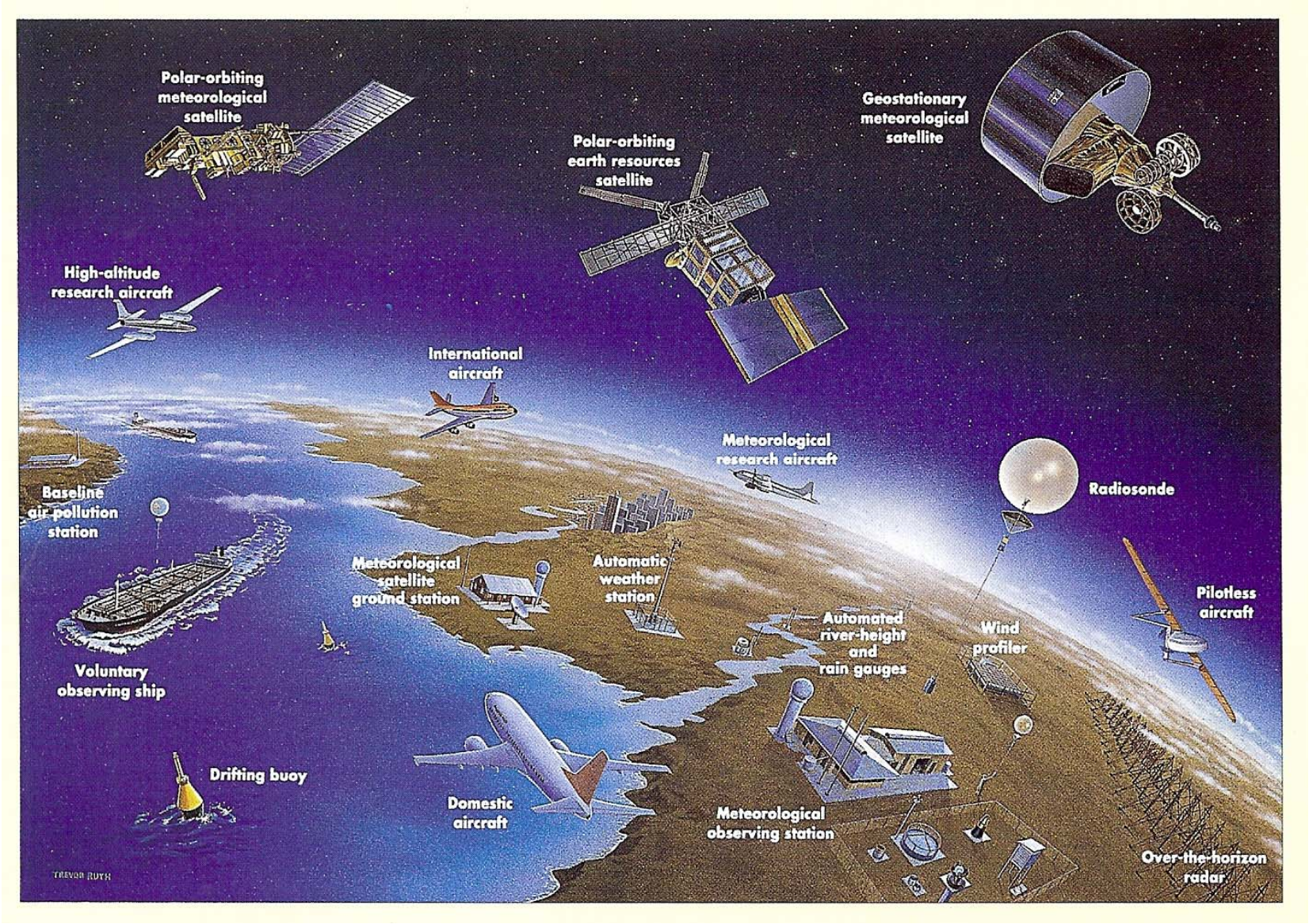
Guiding the Implementation of GCOS in Support of Climate Services

- WMO-IOC-UNEP-ICSU GCOS Steering Committee and domain-based Panels (AOPC, OOPC, TOPC)
- The GCOS Plan (and plans for WIGOS, GOOS, GTOS and GEOSS)
- “ Implementation Plan for the Global Observing System for Climate in Support of the UNFCCC ” (IP-04 and IP-10)
- GCOS Regional Action Plans
- GCOS National Committees & National Coordinators
- GCOS Agents for Implementation (IP-10)

GCOS Agents for Implementation (IP-10)

- **Intergovernmental organisations** sponsoring component observing systems and activities **(WMO, UNESCO, UNEP, FAO, ICSU)**
- **Regional and specialised intergovernmental organisations** sponsoring and/or operating component observing or analysis systems **(ESA, Eumetsat, ECMWF)**
- **National agencies** sponsoring and operating global satellite observing systems
- **National GCOS Implementation Mechanisms** (eg NMHSs)
- **Intergovernmental Technical Commissions** dealing with climate observations **(CBS, CAS, CCI, CHy, JCOMM….)**
- **Scientific Programs and Advisory/Steering Committees** to the intergovernmental bodies **(WCRP, IGBP, Diversitas, …..)**
- **Climate observation systems (WIGOS, GOOS, GTOS etc)**
- **Climate co-ordination mechanisms** and partnerships supporting observational objectives **(CEOS, CGMS, GEO….)**

An Integrated Global Climate Observing System



Delivering Societal Benefits by Building Climate Knowledge in Support of Human Needs