

# **GEWEX Hydroclimate Panel – GHP**

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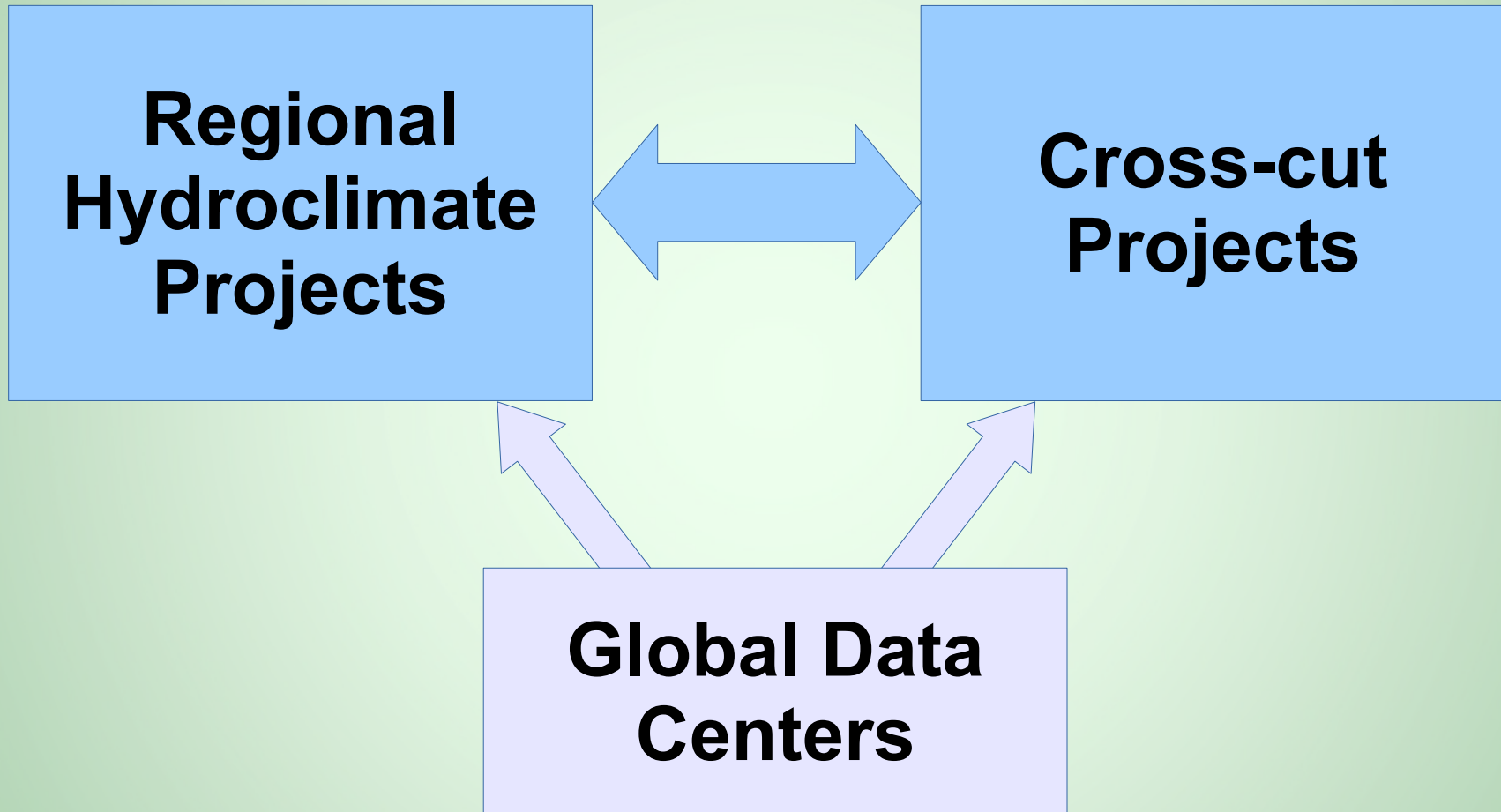


# The role of GHP within GEWEX

**The GHP aims to address the GEWEX Science Questions from a regional and integrated perspective.**

- Only at the regional scale can the water cycle be addressed from its physical to human and socioeconomic dimensions
- The Regional Hydroclimate Projects (RHPs) are an essential tool in this endeavour as they bring together various disciplines on water issues.
- The cross-cut projects allow GHP to propagate knowledge from one region to another and synthesize results at the global scale. They also allow development and testing of applications developed with the new knowledge. (actionable science)

# GHP Structure



# Regional Hydroclimate Projects

- RHPs are generally large, regionally-focused multidisciplinary projects that aim to improve the understanding and prediction of that region's weather, climate, and hydrology.
- All RHPs address the physical processes surrounding water and energy exchanges within a region, thus addressing the GEWEX Science Questions.
- Most RHPs are broader than this, often addressing questions related to the biosphere and carbon cycle, human interaction in the landscape, and even socio-economic factors.

# RHP Status

## Active in 4 continents:

Europe: **HyMEX** (2010-2020) =====> High-impact weather events, societal response

**Baltic Earth** (2016-) =====> Sea and land changes, biogeochemical processes

**PannEx** (2018-) =====> Agronomy, air quality, sustainability & water mgnt

North America: **GWF** (2018-2023) => Cryospheric, ecological, hydrological interactions

## Recently finished:

North America: **CCRN** (2014-2018) => Cryospheric, ecological, hydrological interactions

Asia: **MAHASRI** (2007-2016) =====> Asian Monsoon

Eurasia: **NEESPI** (2004-2015) =====> Northern Eurasian climate-ecosystem-societal interact.

## Prospective:

Andex

## In discussion:

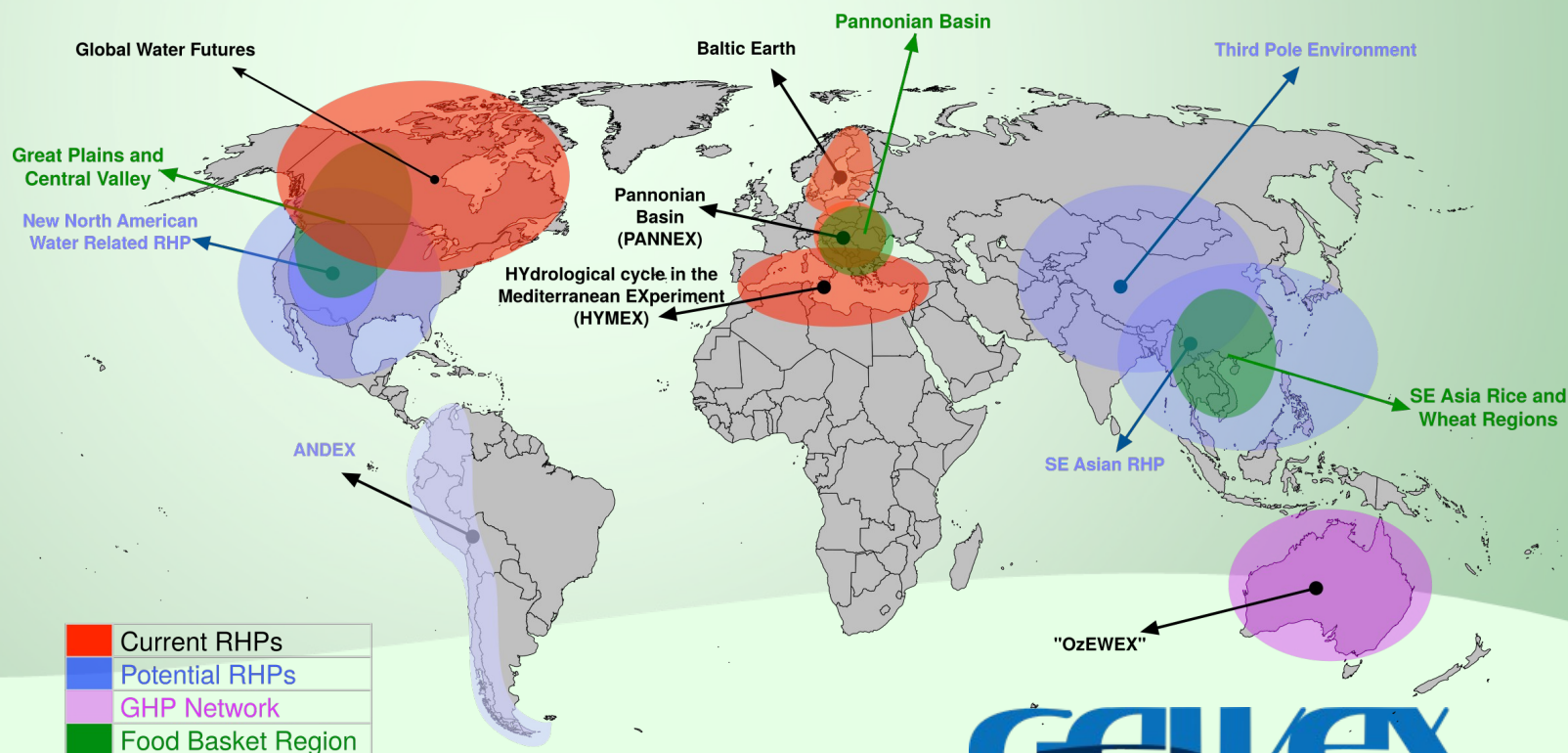
Western USA

TPE

Southern Asia

## GHP Network:

OzEWEX



# Cross-cut Projects - Objectives

- Target GEWEX science questions
- Tackle issues best addressed through large collaborative projects
- Should test and evaluate applications of the knowledge produced in RHPs.
- Generate interactions between RHPs and keep completed RHPs involved
- CC projects are also a tool for collaboration with other GEWEX panels and WCRP projects.
- A way for the broader Community to get involved in GEWEX/ GHP.

# Cross-cut Projects List

## Currently active

- INTENSE (Sub-daily precipitation) (H. Fowler)
- Cold/Shoulder Season Precipitation Near 0°C, (R. Stewart / P. Groisman)
- INARCH (Mountain Hydrology) (J. Pomeroy)

## Proposed

- Determining Evapotranspiration (J. Cuxart et al)

## Potential

- Including water management in large scale models (R. Harding / J. Polcher)
- GDAP integrated product regional evaluation
- MOUNTerrain (Mountainous Terrain rainfall)

# GHP activities in relation to GSQs

GEWEX Science Questions		Regional Hydroclimate Projects				Cross-cut activities
		HyMex	Pannex	Baltic Earth	GWF	
<b>Observations and Predictions of Precipitation</b>	How well can precipitation be described?	y	y	y	y	Near 0°C precipitation
	How do changes in climate affect the characteristics?	y	y	y	y	
	How much confidence do we have in predictions?	y				Mountain precipitation
<b>Global Water Resource Systems</b>	How do changes in the land surface and hydrology influence water resources?	y	y	y	y	Sub-daily precipitation INTENSE
	How does climate change impact water resource systems?	y	y	y	y	
	How can new observations lead to improved management?		y		y	Mountain hydrology INARCH
<b>Changes in extremes</b>	Observing system requirements	y	y		y	Human management in land-surface models
	Modelling capabilities	y	y	y	y	
	Modelling processes involved in extremes	y	y	y	y	Determining Evapotranspiration
	Improved early warning systems		y		y	
<b>Water and energy cycles</b>	Can we balance the budget at TOA?					GDAP integrated product evaluation
	Can we balance the budgets at the surface?	y	y	y	y	
	Can we track the changes over time?	y		y	y	
	Can we relate changes and processes?				y	
	Cloud-aerosol-precipitation feedbacks	y	y			



RHPs are a regional way of organizing most of the GEWEX-oriented activities and make the community grow from the bottom, attracting scientists that would otherwise act in a more isolated manner.

Interaction with the other GEWEX actions is going on and could be intensified through more transversal actions, probably stimulated by enhanced communication between Cross-cut (CC) activities and the other Core programs.

More coordination between CCs and RHPs is encouraged.

# Global Data Centres

- Global Precipitation Climatology Center (GPCC)
- Global Runoff Data Center (GRDC)
  - These data centres continue to produce improved products and there has been interaction between them and GHP
- International Data Centre on Hydrology of Lakes and Reservoirs (HYDROLARE)

# Introducing GHP Networks

Networks should facilitate collaboration and capacity building activities in areas of GEWEX science.

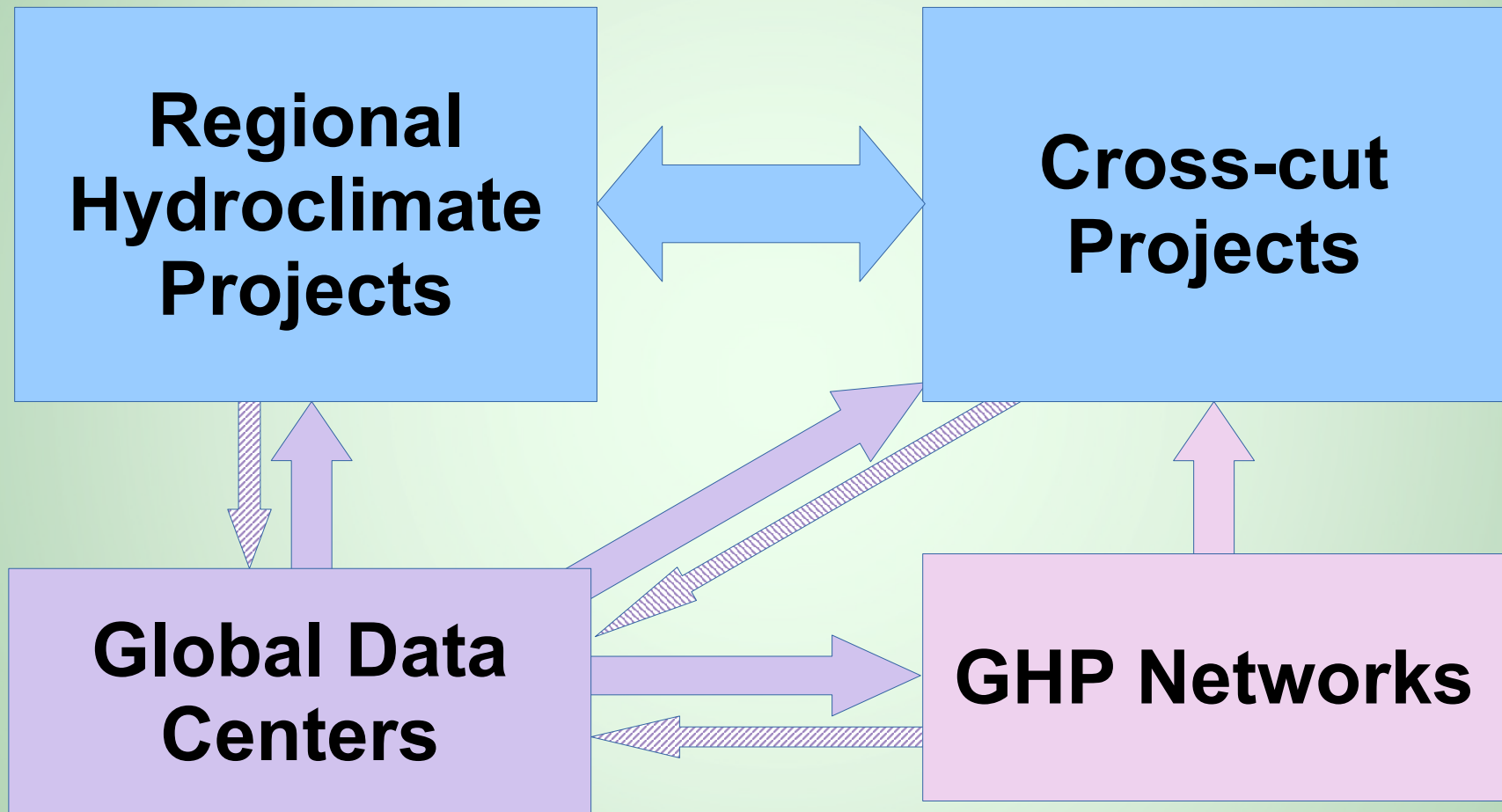
They are a mechanism for new communities to be connected to GEWEX while developing towards a RHP.

They are a way for networks developed within initiating RHPs to maintain activity and a GEWEX connection if they fail to reach the criteria required of a full working RHP.

They provide a mechanism for networks developed during RHPs to maintain activity and connections with GEWEX after the RHP has completed.



# GHP Structure



# Summary

- The GHP strategy to address GSQs and WCRP GCs is through regional hydroclimate and cross-cut projects.
- The regional focus of GHP also allows us to reach out to applications and transform our knowledge into actionable information.
- A steady stream of new RHPs and CCs are being proposed. These need assistance in the early stages of project creation in order to gain momentum and to ensure they align with the GSQs & GCs.
- A new activity “GHP Network” is proposed to keep completed RHPs and Prospective RHPs that do not evolve into full RHPs involved in GEWEX activities.