

# PAGES Focus 2: Regional Climate Dynamics

## Aims

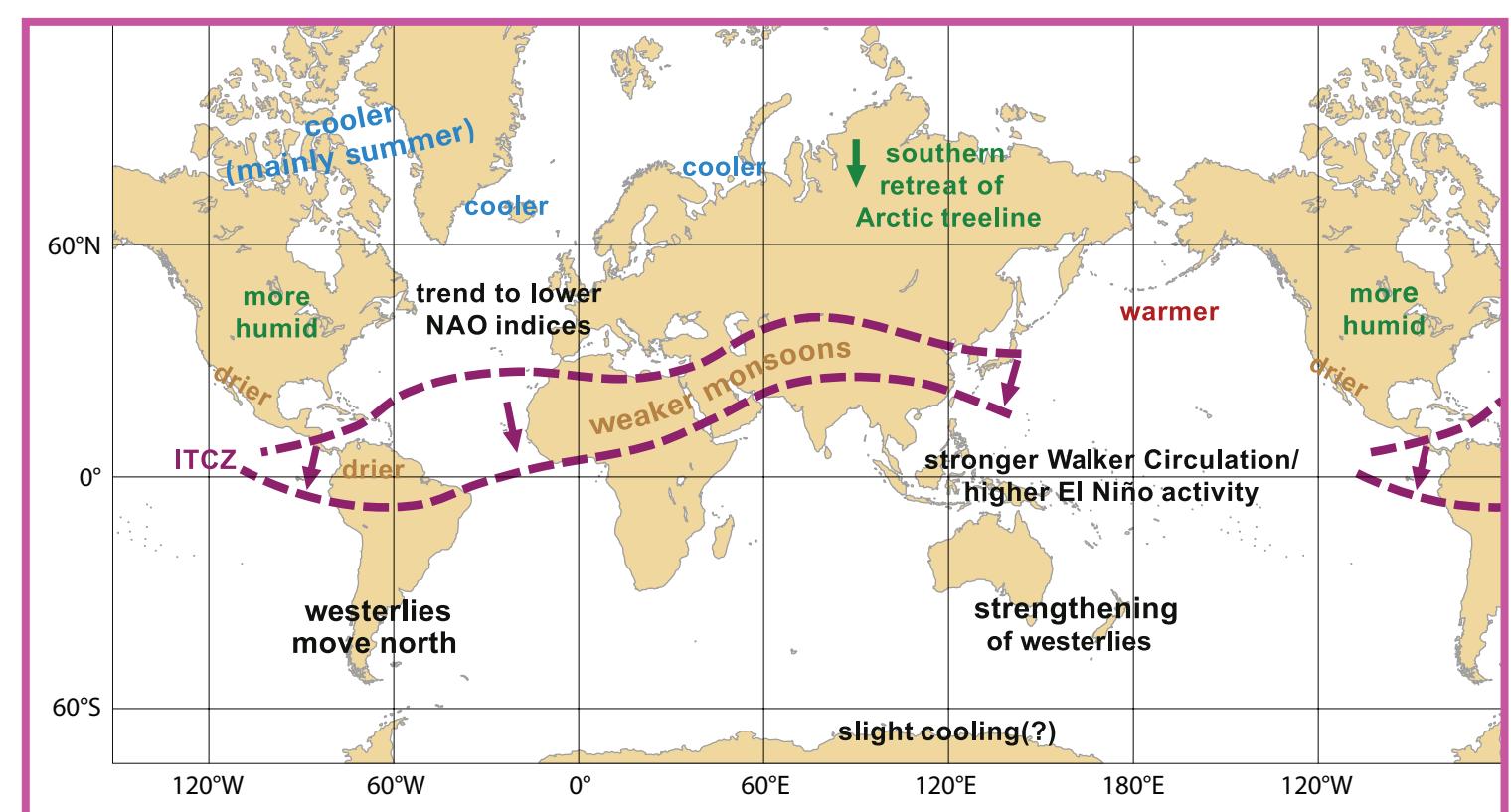
Focus 2 seeks to achieve a better understanding of past regional climatic and environmental dynamics through comparison of reconstructions and model simulations. Activities contribute towards a global coverage of high-resolution, well-dated paleoclimatic data, reconstructions of past climate-state parameters (e.g., temperature, precipitation, atmospheric pressure fields), a better understanding of past modes of climate variability and their teleconnections, and of rapid and extreme climate events at the regional scale. The Focus hosts activities that promote data-model comparisons and collaborates closely with Cross-Cutting Theme 2 on proxy development and calibration. The timescales covered by this Focus encompass the last 130 ka, in particular the time streams of the last glacial-interglacial cycle, the Holocene and the last 2 ka.

## Activities & Goals

LAST GLACIAL CYCLE    HOLOCENE    LAST 2 MILLENNIA    RECON. METHODS

### Goals across all 4 Themes:

- To develop datasets that describe the patterns of past climate change and climate variability at the regional scale, including the major climate state variables, such as air pressure, temperature, precipitation or precipitation minus evaporation (P-E) and atmospheric and oceanic circulation patterns, for the last 2 ka and wherever possible during the last glacial cycle (last 130 ka).



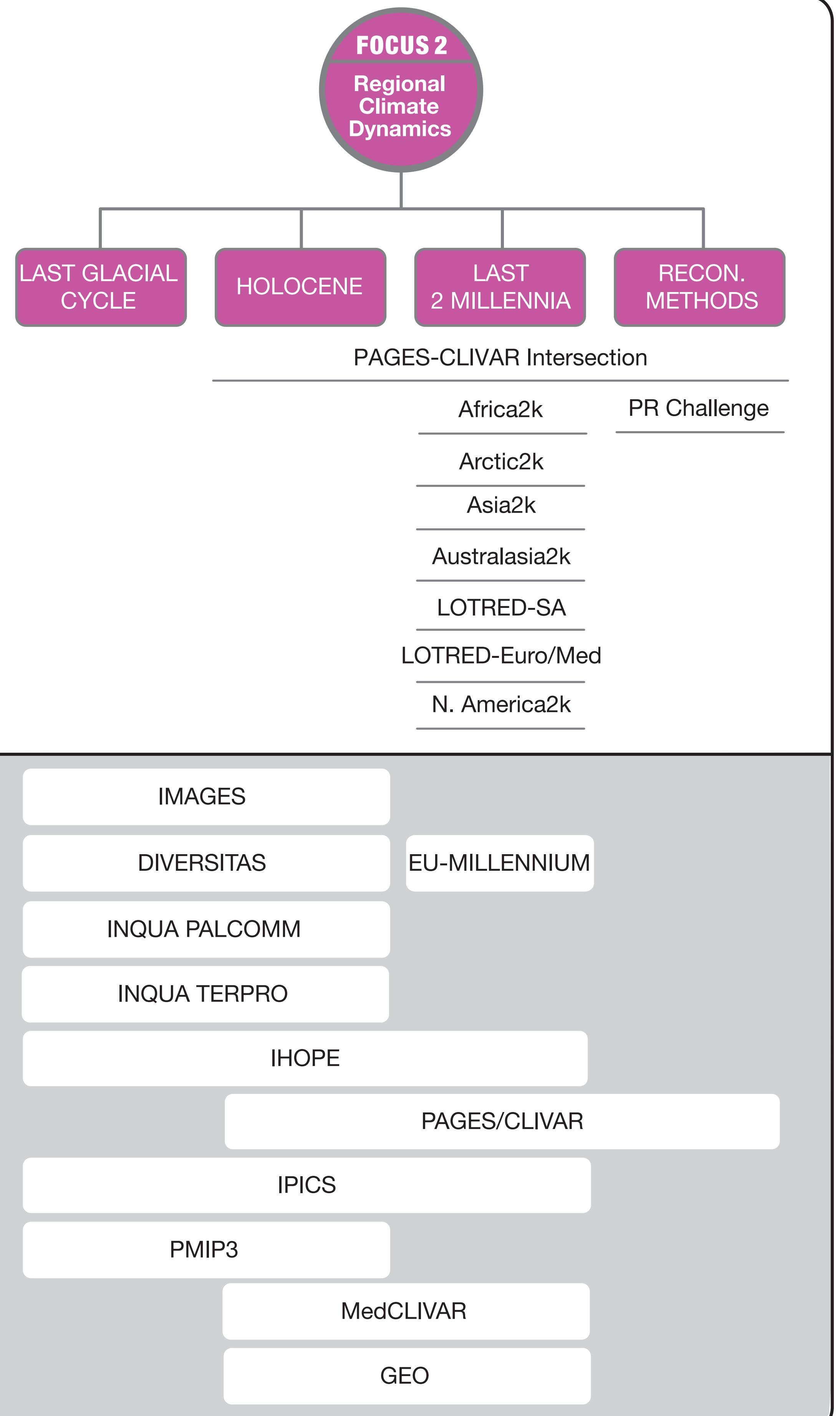
Spatial synthesis of Holocene climate trends from proxy evidence - global climate change for the pre-industrial period (ca. AD 1700) compared to the mid-Holocene (ca. 6 cal ka BP) (figure modified from Wanner et al., 2008).

- To examine the regional response of marine and terrestrial ecosystems to large-scale changes in the climate system. Activities towards this goal are being coordinated with Focus 4 on Human-Climate-Ecosystem Interactions and offer links to the International Programme on Biodiversity Sciences (DIVERSITAS).
- To better understand the mechanisms (natural and anthropogenic forcing, internal variability, feedbacks, sensitivity) operating in the climate system that determined regional variations (including abrupt and extreme climate events) of climate and environment over the past 130 ka.

## Rationale

Information on past climate dynamics at the regional scale allows us to characterize local amplitudes and rates of change. Furthermore, it allows us to better assess the consequences of current and future changes, by providing a context for observed climatic-environmental change, long-term records to analyze multi-decadal and slower processes, and benchmark scenarios for general circulation models. Consequently, Focus 2 places a strong emphasis on regional studies that consider past climate dynamics on seasonal to millennial timescales and (sub-)continental or ocean-basin spatial scales. Studies in this Focus include multi-proxy reconstructions of the key climate parameters, and transient paleo-runs with models of different complexity and resolution.

## Structure



Structure of Focus 2. Top: Focus Themes (pink boxes) with the corresponding Working Groups below. Bottom: Overlap with external programs (white boxes).

## Implementation

The activities of each Theme will be carried out by Working Groups (WGs). In particular, the Last 2 Millennia Theme has a large number of active WGs with a regional scope. These WGs aim to achieve a global network of regional synthesis of climate variability for the last 2 ka. The IGBP cross-program Global Palaeofire WG is assigned to the Last Glacial Cycle Theme, as it specifically studies regional environmental dynamics over this period. Other WGs under the Holocene and Last Glacial Cycle Themes will be developed to bring together researchers currently working on these time periods. The Past Interglacials WG (see Focus 3) will contribute to both Themes through spatial studies of the last interglacial and the Holocene. The Paleoclimate Reconstruction Challenge (PR Challenge) is a NOAA-supported project and PAGES WG under the Spatio-Temporal Reconstruction Methods Theme, and provides benchmarks for the reliability of proxy reconstructions.