

# Development of an integrated climate change impact assessment tool for urban policy makers (UrbanCLIM)

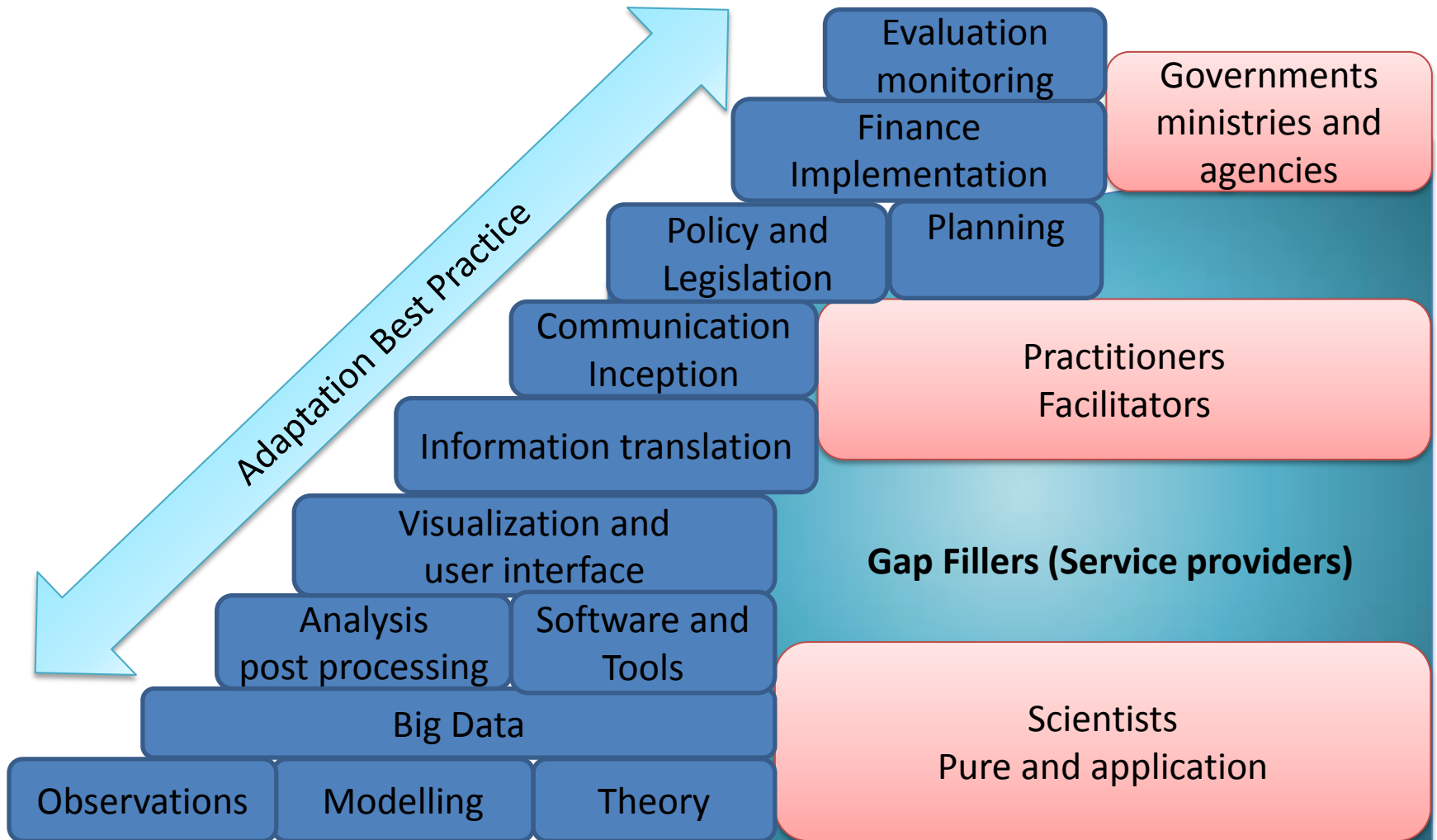
(1) Development of high resolution climate change projections based on regional climate model (RCM) output from RMIP3.

(2) Development of an integrated impact assessment system including the major sectors in urban areas through working closely with the urban policy makers and planners, based on system dynamics approaches.(UrbanCLIM)

(3) Training workshops, dissemination and publications will be carried out during the latter stages of the project.



# Challenges and opportunities



# Gap filler philosophy

## Practice-driven Research

*If society has a technical need, that helps science forward more than ten universities. (Friedrich Engels)*

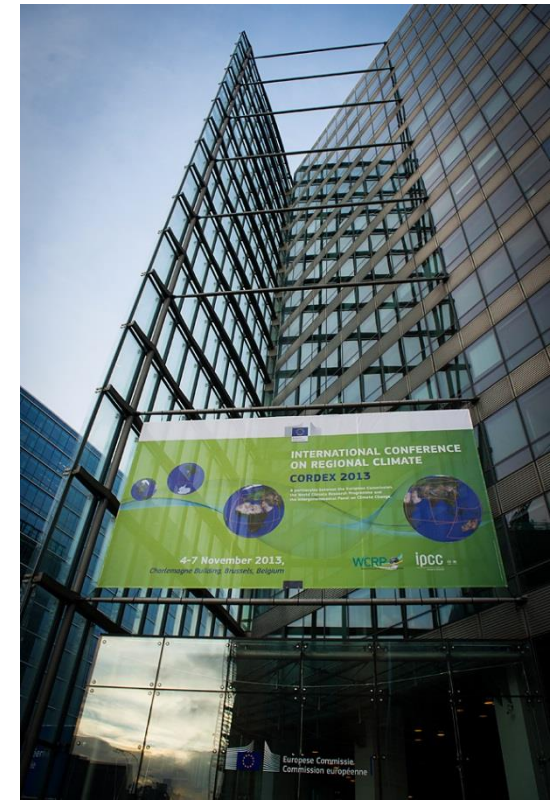
## Provide solutions to fill up the gaps

*Out of clutter, find simplicity (Albert Einstein)*

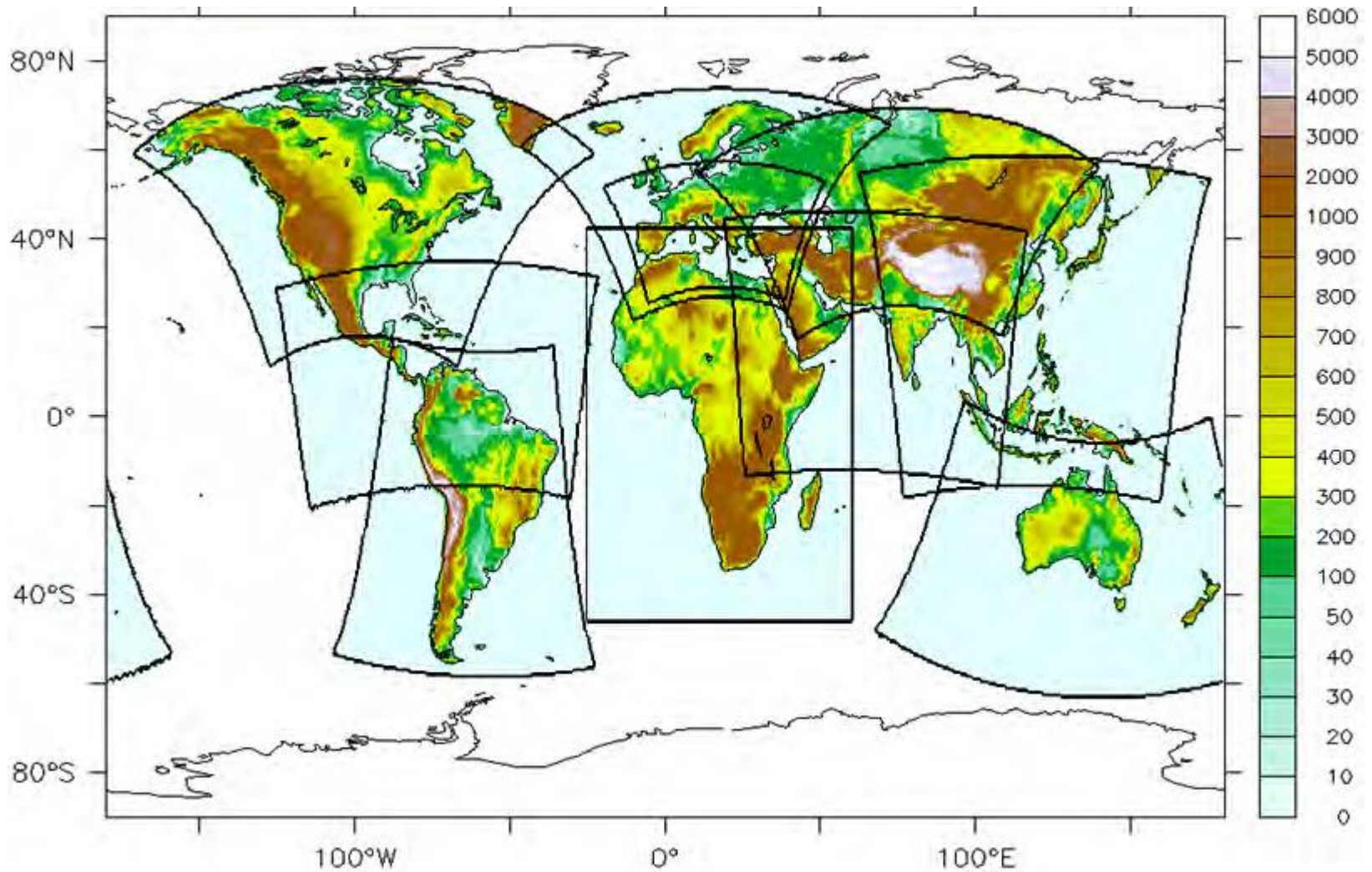
*Help Out People Effective (HOPE) (David Bishop)*

# CORDEX and RMIP

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# CORDEX



# Initial CORDEX priorities ~2009

Develop a framework to compare, evaluate, document and improve (best-practice) Regional Climate Downscaling (RCD) techniques for use in downscaling global climate simulations.

Foster an international coordinated effort to produce multi-RCD high-resolution climate information for (land) regions worldwide.

Promote interaction between global modellers, the RCD community and user communities to support impact/adaptation activities.

Support regional capacity building to enable local generation, analysis, documentation and communication of climate information.

# CORDEX conclusion

## Dialogue and co-exploration with end-users

Participants recognized the need for a paradigm shift in which regional climate science operates by **placing end-users expectations and needs at the heart** of the development of regional climate information through a change in perspective on the analysis and exploitation of climate model outputs, leading to new science policy approaches.

For example, co-development and co-exploration amongst climate scientists and practitioners and stakeholders would ensure the **appropriate tailoring of climate information at relevant spatial and temporal footprints with more effective two-way communication** leveraging regional and local know-how.

The need for training, capacity building and innovative information and knowledge transfer mechanisms would provide the necessary instruments for effective delivery of climate services contributing to the **WMO-led UN Global Framework for Climate Services (GFCS) and the Future Earth (FE) initiative.**

# Added value of regional climate information

Added value is best illustrated in higher order statistical analysis at the regional and local topographic and process level **but much remains to be done to improve** the physics of regional models, to demonstrate the robustness of results and to ensure the systematic skill enhancement of downscaling exercises.

High-resolution observational data sets and archiving infrastructures such as the Earth System Grid Federation (ESGF) will be instrumental in supporting necessary model development and evaluation, and in gaining confidence in regional climate projections.



# Uncertainty

The use of multiple RCMs or multiple downscaling methods **appears to increase uncertainty**, especially at smaller scales and there is a need to develop robust methods to characterize and communicate uncertainty to the various end-users and stakeholders.

**Better uncertainty characterization** would also help set priorities for improving downscaling. Multi-model ensembles of dynamical and statistical downscaled products require **further innovative post-processing approaches** to distil, fuse and possibly reconcile imperfect, and sometimes contradictory, information.

# Finally, three 'big' questions for CORDEX:

- How to make the Tb of CORDEX data available and accessible?
- How to integrate the user and decision maker context into the application of regional climate science?
- What are the limits to regional information  
– and how to communicate them?



# Future simulation framework (CORDEX-II)

A critical mass of multi-model multi-method experiments is needed to capture the necessary uncertainty for robust decision-making and policy challenges. The **growing range of practical applications will also require more complex models towards a better representation of the Earth System through Regional Earth System Models (RESMs).**

In addition, as the resolution of global models increases, it is recognized that regional **downscaling tools should also aim at increasingly finer scales to provide added value and useful information for VIA applications.**

This may require revisiting the CORDEX domains and developing a clear science-based procedure for their selection. Furthermore, end-to-end pilot studies over selected subregions are needed to provide test-beds to explore a range of critical issues