



**World Meteorological Organization  
WCRP Climate Research Forum for South America**

# **Innovation in the WMO Regional Associations: diagnostic and recommendations**

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Member of the WMO Research Board

# WMO Research Board



The Research Board on Weather, Climate, Water and the Environment translates the strategic aims of WMO and decisions of Executive Council and Congress into research priorities, and ensures the implementation and coordination of the research programs.

The Research Board is working on key relevant topics:

1. Advancing earth system modeling and observations
2. Exascale computing and data handling / machine learning and AI
3. Science for services
4. **Innovation in the regions**

# WMO Research Board Concept Note: **Innovation in the Regions**

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# Why to study “Innovation in the regions”?

- To guide the WMO Research Board and Regional Associations in:
  - Setting the priorities for research & development in the RA
  - Coordinating science projects at regional level
  - Identifying possible partnerships (or funding agencies) to further engage the academia with the NHMS priorities
- To inform the WMO Research Board on:
  - Key areas to be advanced during the 2020-2021 period
  - How to organize science topics for the science sessions at the RA meetings

# Information solicitation

- Web-based questionnaire
- Objectives: i) to know the current status of research in WMO regions  
ii) to identify the challenges to engage NMHS in research
- Input from Research Board Members, many NMHS staff, some researchers, Early Career Scientists network.

Submitted to

RAIV (North America,  
Central America &  
Caribbean)

RAVI (Europe)

**RAIII (South America).**



- ARGENTINA
- BRAZIL
- ECUADOR
- PARAGUAY
- SURINAME



ORGANIZACIÓN  
METEOROLÓGICA  
MUNDIAL

## Ciencia para los Servicios Meteorológicos: necesidades de investigación científica en la Asociación Regional III (Sudamérica) de la OMM

Esta es una consulta informal a expertos de los Servicios nacionales de Meteorología e Hidrología (SMHN), universidades, centros de investigación sobre las necesidades prioritarias de investigación científica en la Asociación Regional III de la OMM (Sudamérica). la información suministrada será usada para la preparación de un White paper sobre "Innovación en las regiones", una de las primeras actividades de la recientemente implementada Junta de Investigación de la OMM.

Este formulário coleta automaticamente os endereços de e-mail dos usuários de Wmo.int. [Alterar configurações](#)

# Survey

1. How can research in the academic community be made available to NMHSs and for climate services?
2. Which organizations at the country or regional level are active in research?
3. What is the status quo for funding mechanisms or schemes?
4. Can you provide examples of partnerships that your NMHS has developed with research institutions in your country or region?
5. Identify one pressing regional problem that needs attention from WMO research.

# Survey outcomes

## Where does research take place?

- In regions with more advanced scientific capacity, research takes place in NMHS, universities, national labs, and through regional entities (e.g., UMETSAT, EUMETNET, ECMWF in RA VI).
- In developing regions, research in NMHS is not a main focus, as many are hard-pressed for human and technical resources to support their operational forecasting. Some NMHS conduct research on high impact events or for development of forecast products.

# Survey outcomes

## Research funding

- Developed countries → government-funded research, through agencies and foundations that fund research in academia, laboratories, and, even the private sector through calls for proposals.
- Developing regions → government-funded mechanisms for research are less common or non-existent. Other funding: international donor projects, charitable foundations, private sector, or academic institutions.

# Survey outcomes

## Common research priorities



**Climate, climate variability, climate change**



**Tropical cyclones**



**Impact-based forecasting**



**Disaster risk reduction**



**Hydrology**



**Aviation**

# Survey outcomes

## Challenges to research in developing countries

- Financial - Limited funding for research
- Language - Most research journals are in English Language
- Education - Secondary and higher education systems are not research oriented
- Data sharing - Various barriers were identified (institutional, management, financial, legal and policy issues)
- NMHS lack norms and traditions of more collaborative and multidisciplinary research

# Survey outcomes

## Top key priorities to be addressed by WMO Research Board in RAIII

### Argentina:

- WMO should standardize grey literature publications, and encourage publications in regional journals
- Identify common research topics (academia and NMHS) to be funded
- Develop research connected to urban and health services
- Apply artificial intelligence to improve nowcasting and climate services

### Brasil:

- Coordinate networks between researchers in connection with NMHS
- Create a regional project with NOAA related to satellites

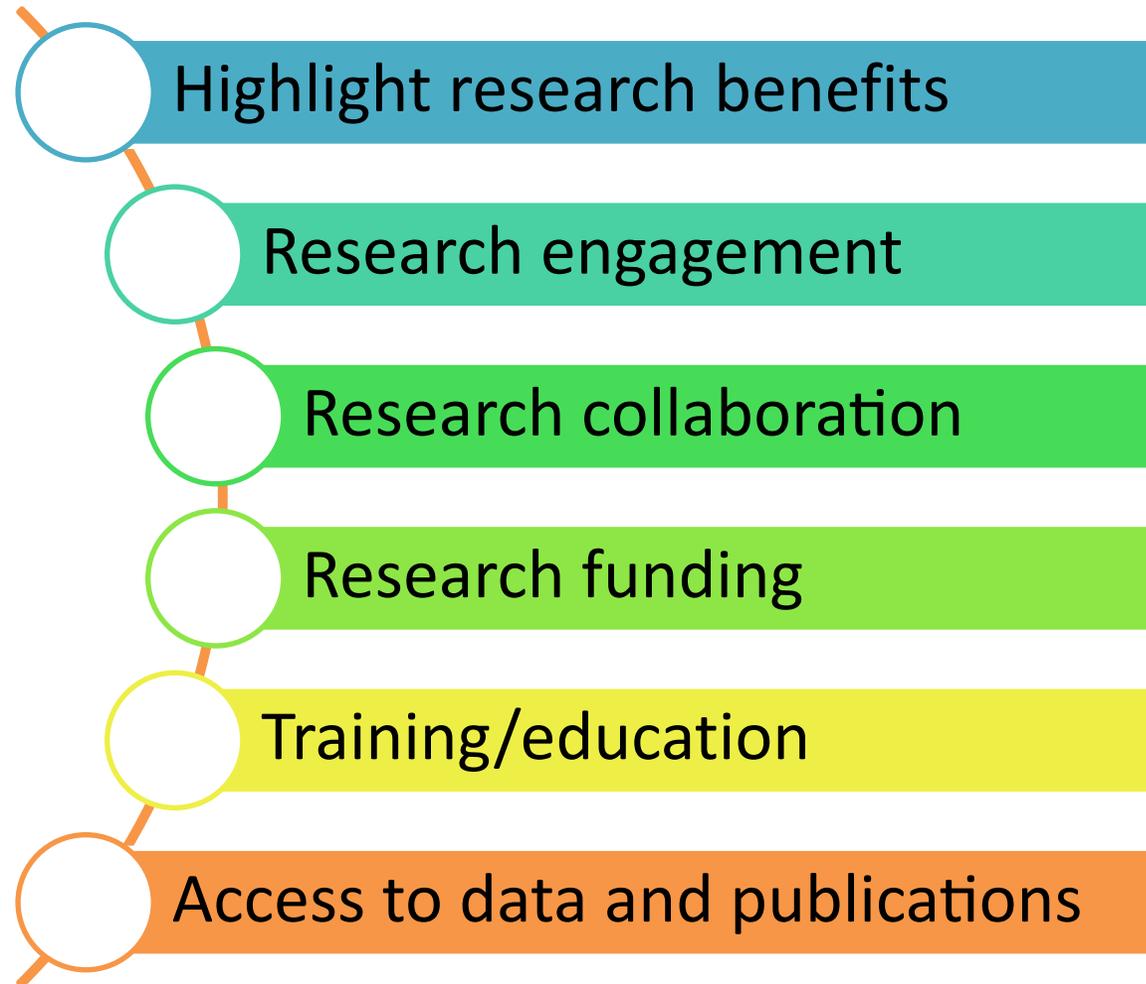
**Ecuador:** Research on interactions between climate & health

### Paraguay:

- Training and education of personnel working at NMHS
- Research funding for multicollaborative projects to develop climate services

**Suriname:** Lack of climate scientists

# Recommendations to improve R&D within NMHS in developing countries





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**Gracias**  
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**Thank you**