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Collaborative Partnership on Forests

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WFW Main Event:

Forest and Water on a Changing Planet: Redefining the Narrative

Friday, 20 July 2018, 11:30-13:00, Green Room

GLOBAL FOREST EXPERT PANEL ON FORESTS AND WATER

“Forest and Water on a Changing Planet”

UN High-Level Political Forum on Sustainable Development (HLPF 2018) in New York, USA (10 July 2018)

FAO Committee on Forestry (COFO), Rome (20 July 2018)

Co-Chairs:

Meine van Noordwijk and Irena Creed

IUFRO-led initiative of the Collaborative Partnership on Forests (CPF) supports forest-related intergovernmental processes by producing assessment reports on emerging global issues of high concern

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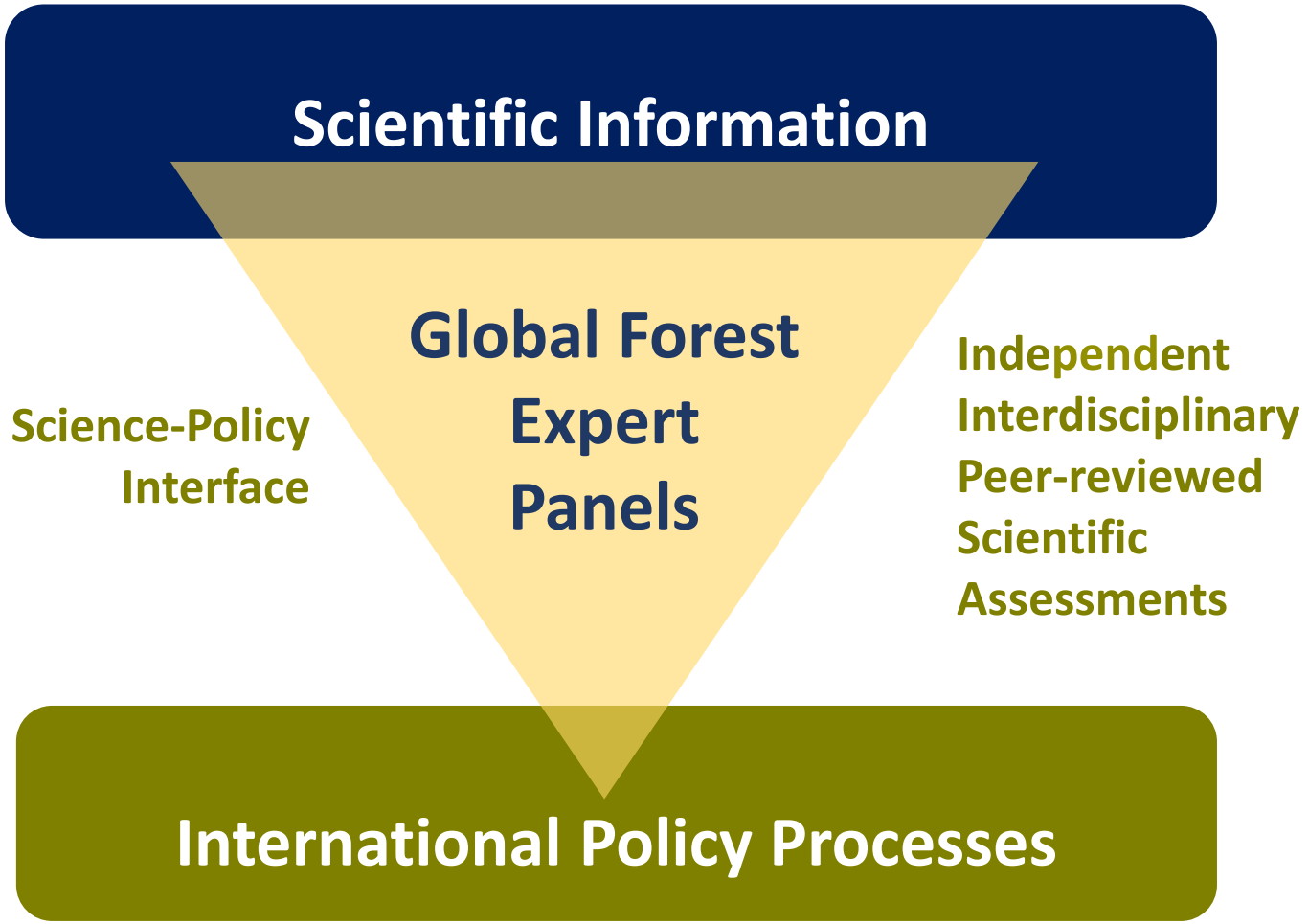
Forest and Water on a Changing Planet: Vulnerability, Adaption and Governance Opportunities



Scientific Expert Panel and **Contributing Authors** consisted of **50** scientists from more than **20** countries + peer review of draft

Assessment of existing scientific literature (> **1000** references from last 10 years).

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Forest and Water on a Changing Planet: Vulnerability, Adaption and Governance Opportunities

Focused on three key questions:

"Do forests matter?": To what degree, where and for whom, is the ongoing change in forests and trees outside forests increasing (or decreasing) human vulnerability by exacerbating (or alleviating) the negative effects of climate variability and change on water resources?

"Who is responsible and what should be done?": What can national and international governance systems and co-investment in global commitments do in response to changes in water security?

"How can progress be made and measured?": How can the UN SDG framework of Agenda 2030 be used to increase the coherence and coordination of national responses in relation to forests and water across sectors and from local to national and international scales?

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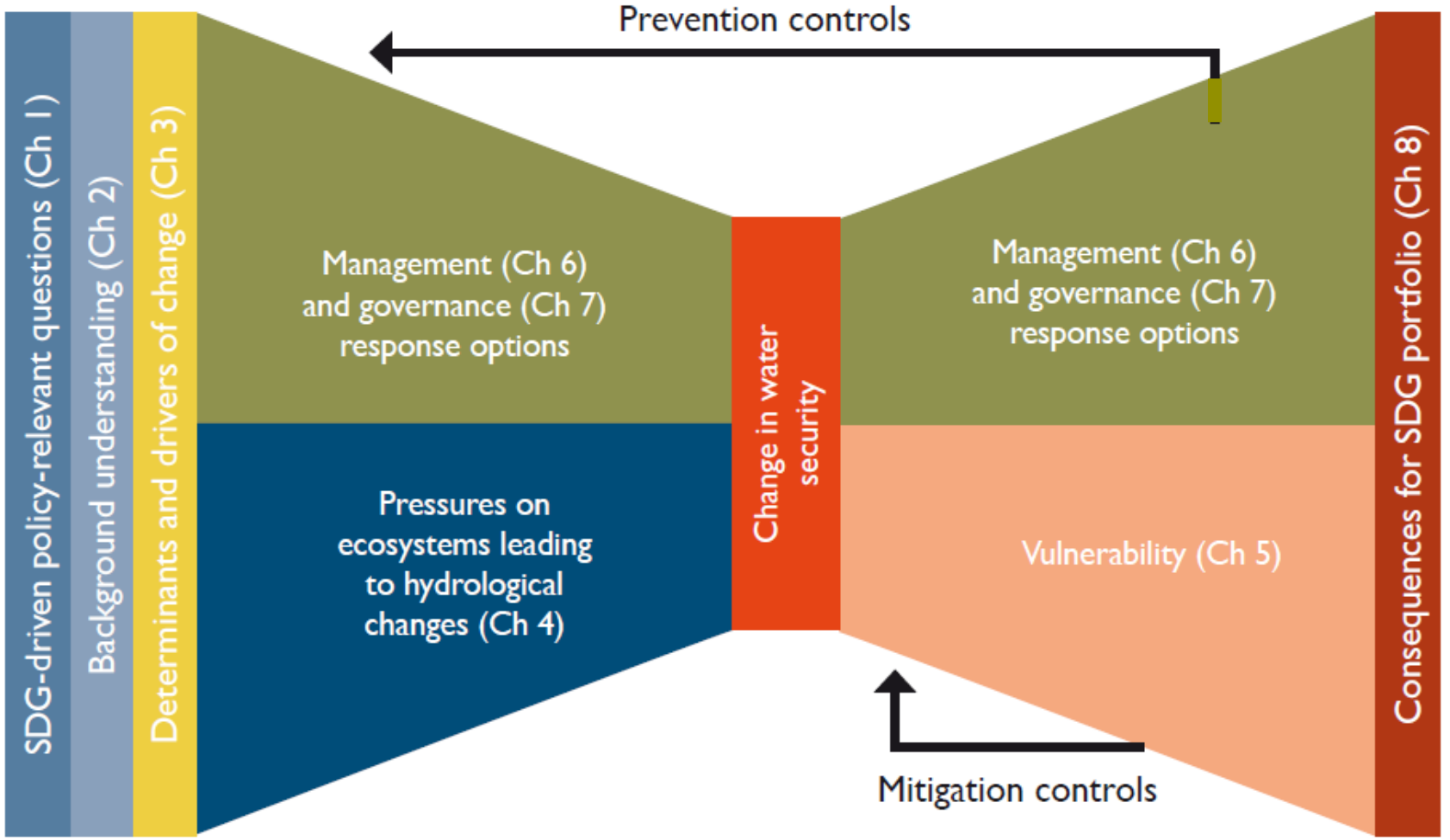
The International Organisation of Standardization (ISO) 31010 Bowtie Risk Management Tool inspired the structure of the report.



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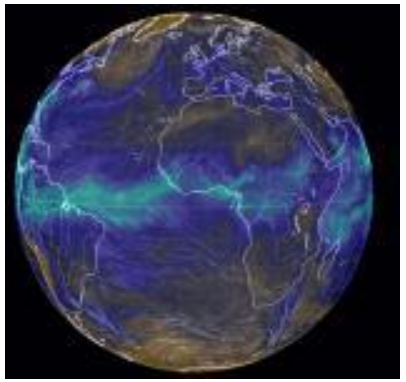
Upwind dependency



and downwind effect in precipitationshed

Missing governance link

Global climate dependence and influence of forest-water relations via carbon cycle

SDG15,16 Forest governance

SDG13

SDG1,15

people

SDG2,3,6,7,9

SDG6,15,16 Water governance

Forest – water relations

Streamflow

Climate

Governance

Forest

People

Water

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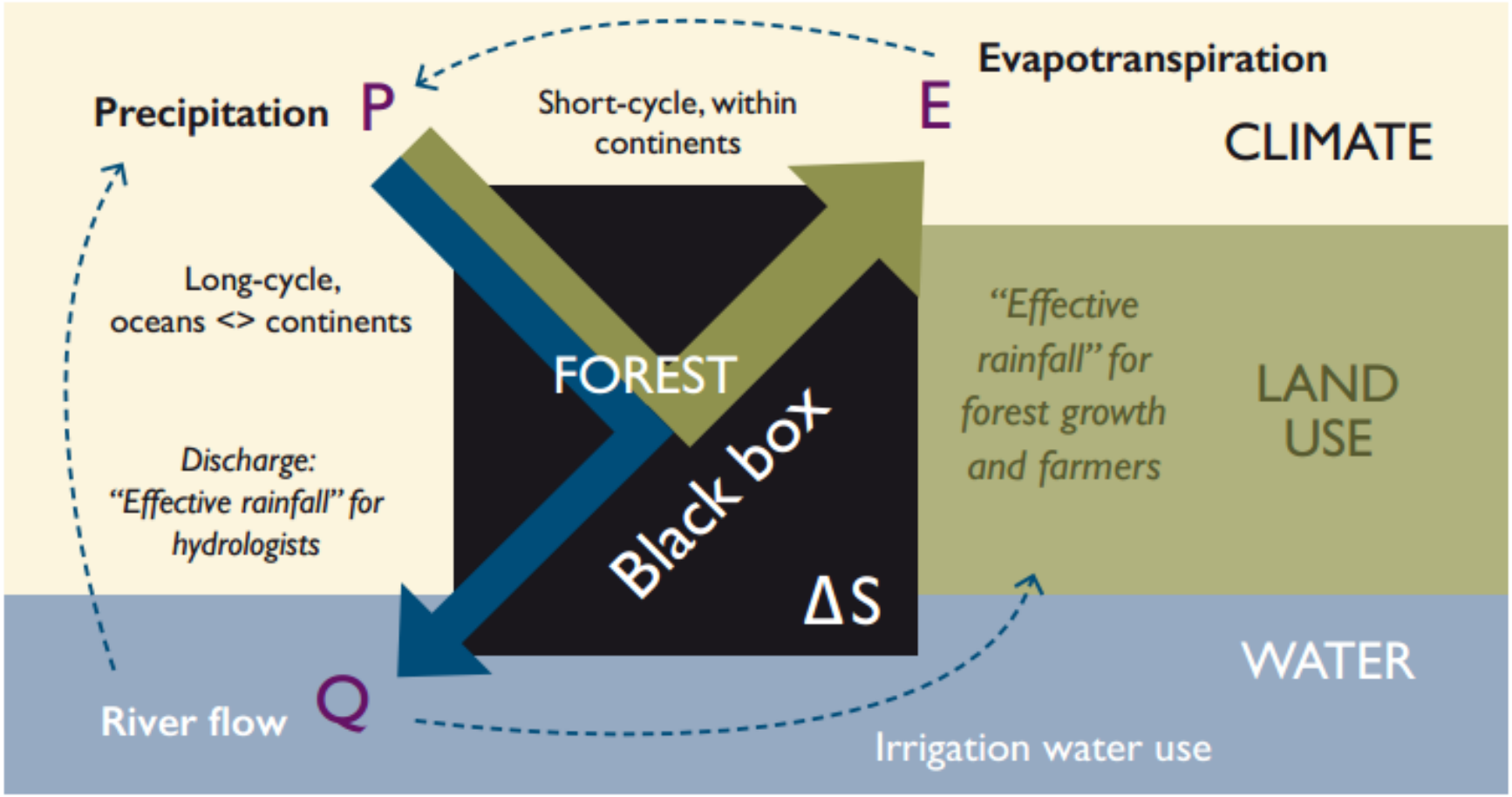
Hydrological cycle and the way precipitation (P) is partitioned over evapotranspiration (E) and river flow (Q) at time scales in which the change in soil water storage (ΔS) is considered to be negligible

Figure 1.6



Source: Authors' own elaboration

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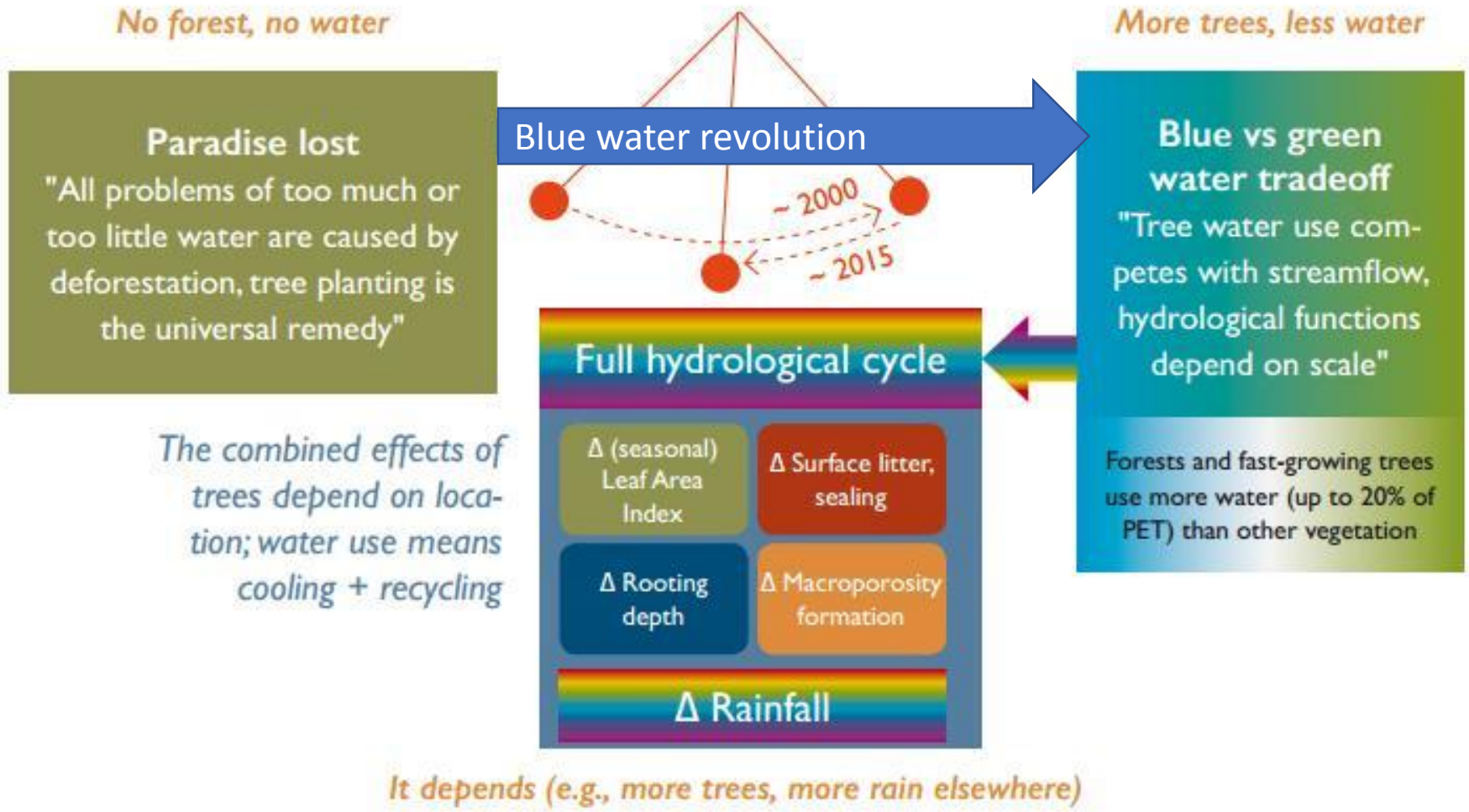
Cartoon of a pendulum swinging between three public perspectives of the key forest-water relations

Figure 1.7



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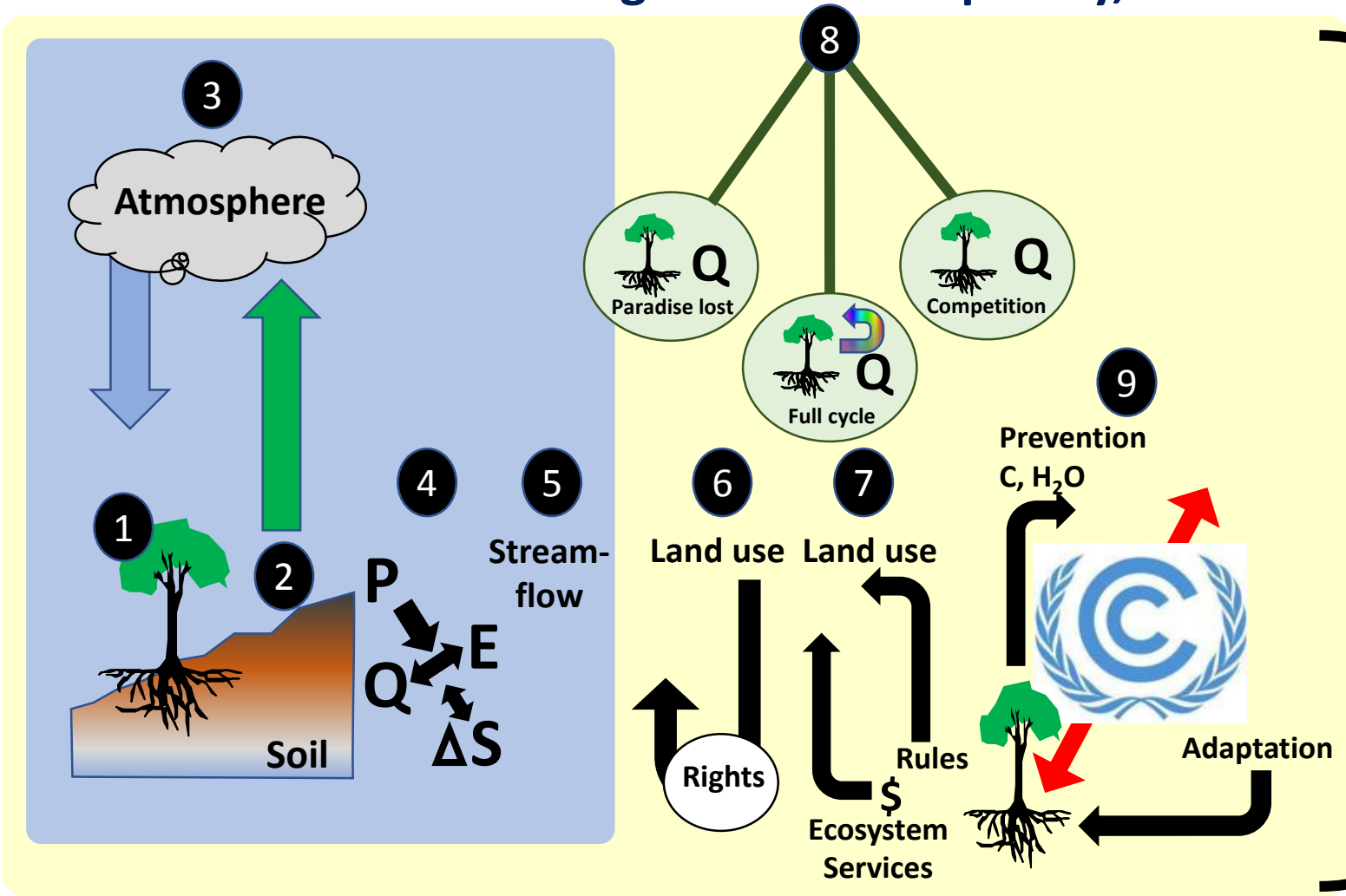
The report reviews recent science for 10 nested scales, with increasing levels of complexity, to answer the three questions.



"Do forests matter?"

"Who is responsible and what should be done?"

"How can progress be made and measured?"

Forests modulate *supply* of blue water, but also influence *demand* for green water, and this implies recycling of atmospheric moisture.

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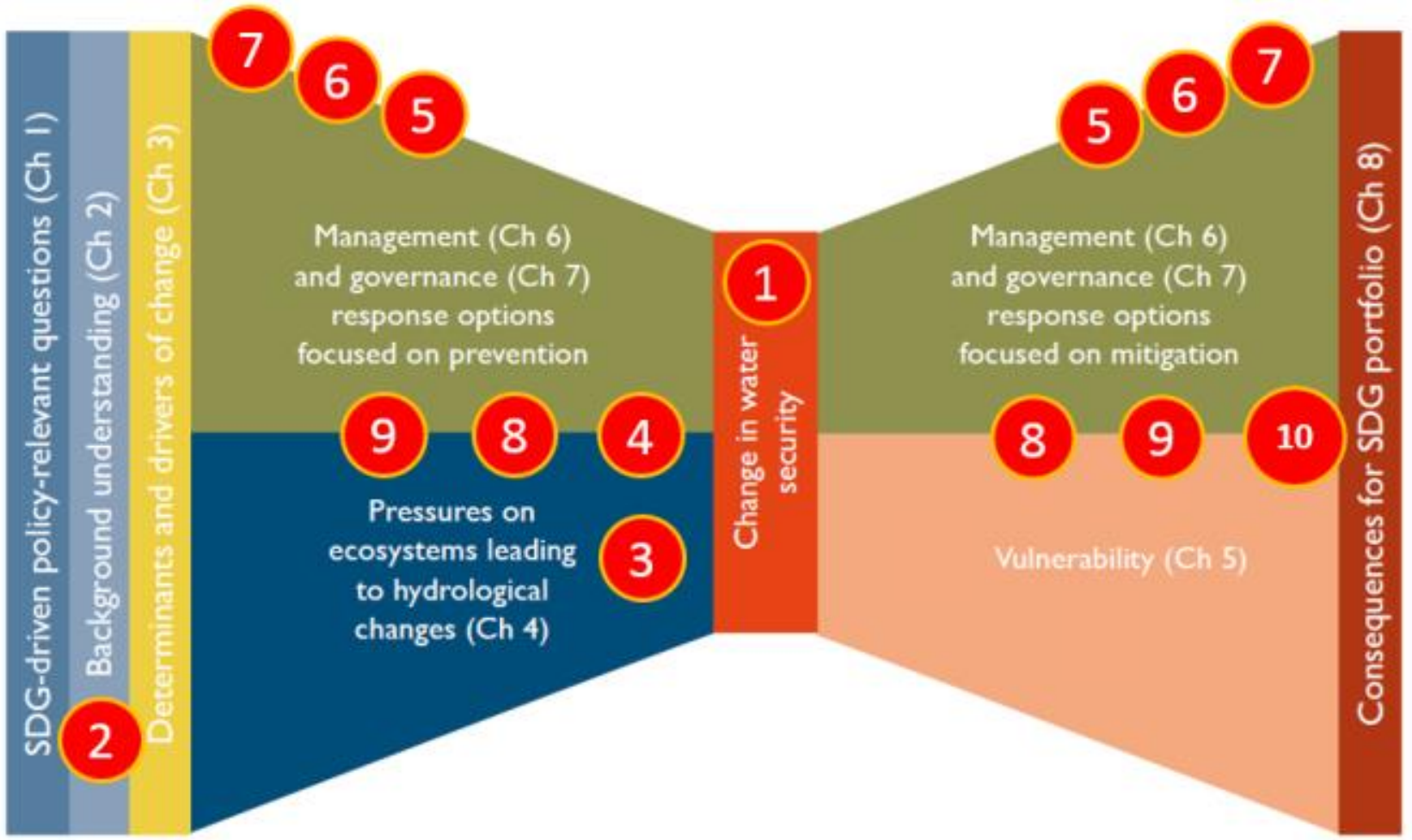
10 insights for informing international policy processes to achieve the UN's Sustainable Development Goals.



Main Message:

Science-based discussion on forests and water at local, regional and continental scales must form a key component of policy processes geared to achieving the SDGs.

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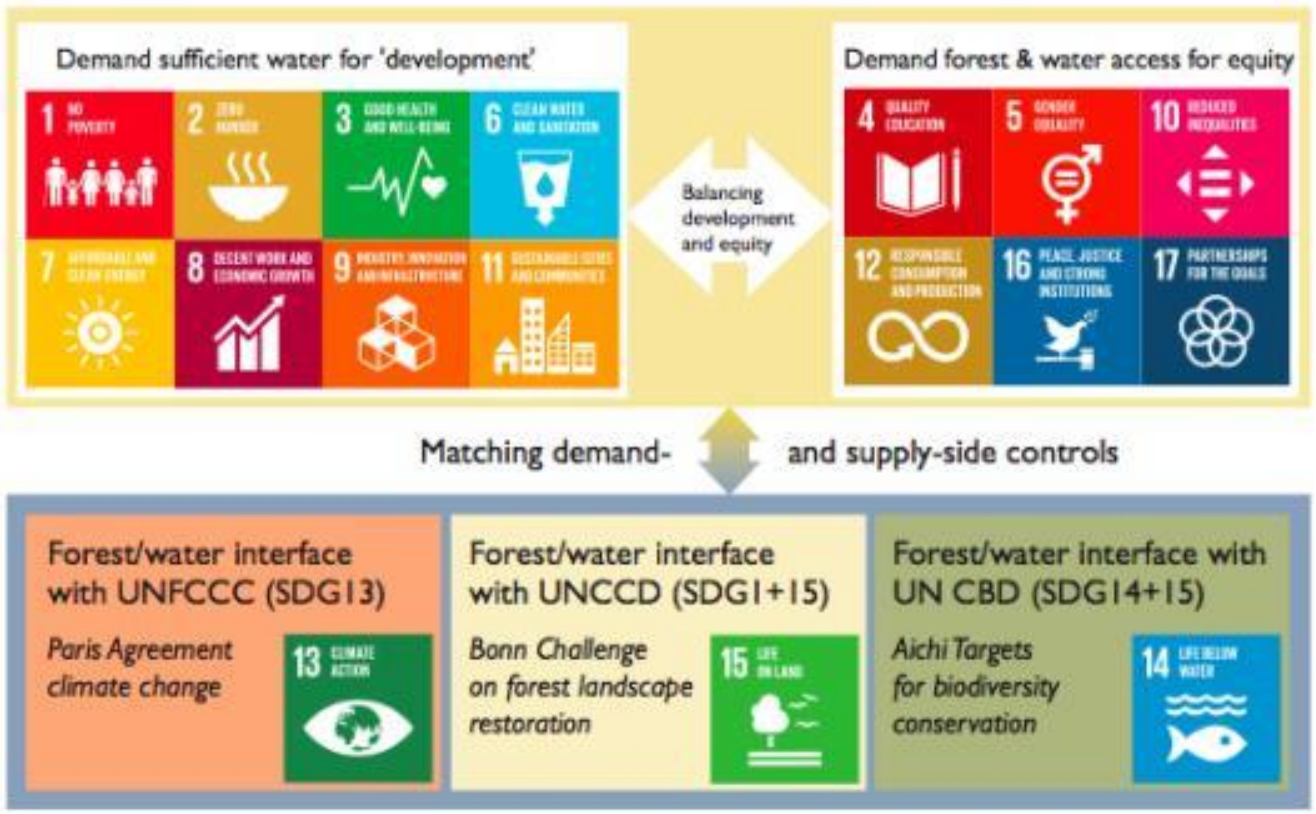
Insight: Water is central to all 17 SDGs. 1



- 4 billion people do not have sufficient access water, and the capacity of forests to provide water is increasingly threatened.
- 3 SDGs support the other 14 by securing the integrity of the planetary system.
- 8 SDGs call for an increased water security to meet development demands.
- 6 SDGs call for an increased water security to address social justice and equity.

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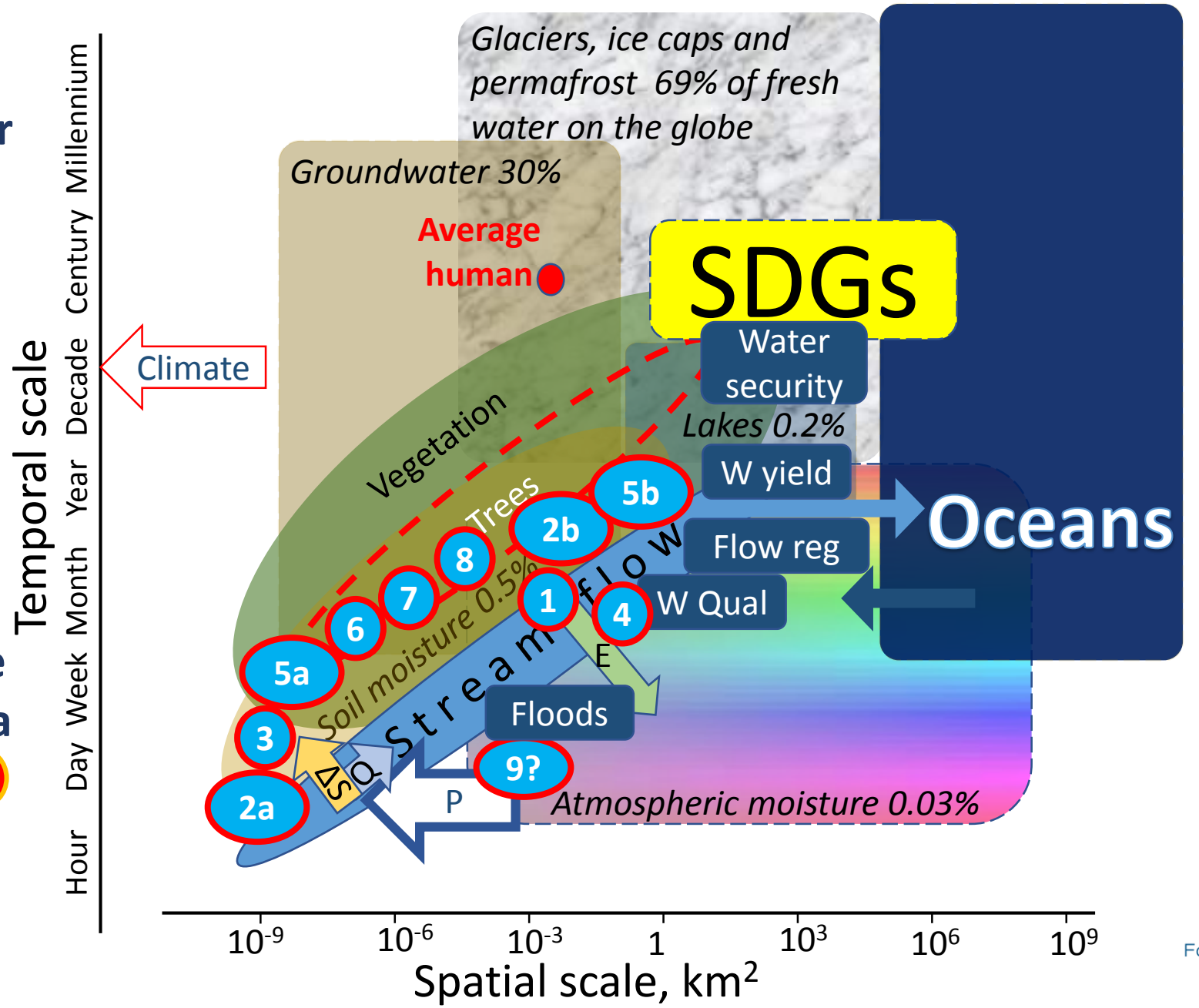
Insight: Climate, forests, water and people are inextricably interconnec-ted, and, despite the complexity this creates, they must be managed as a system. 2



Tree effects on watershed functions:

1. Water transmission
2. Buffering peak flows
3. Increased infiltration, groundwater release
4. Water quality
5. Slope & riparian stability
6. Reduced erosion
7. Modified microclimate
8. Coastal protection

9? Rainfall triggering

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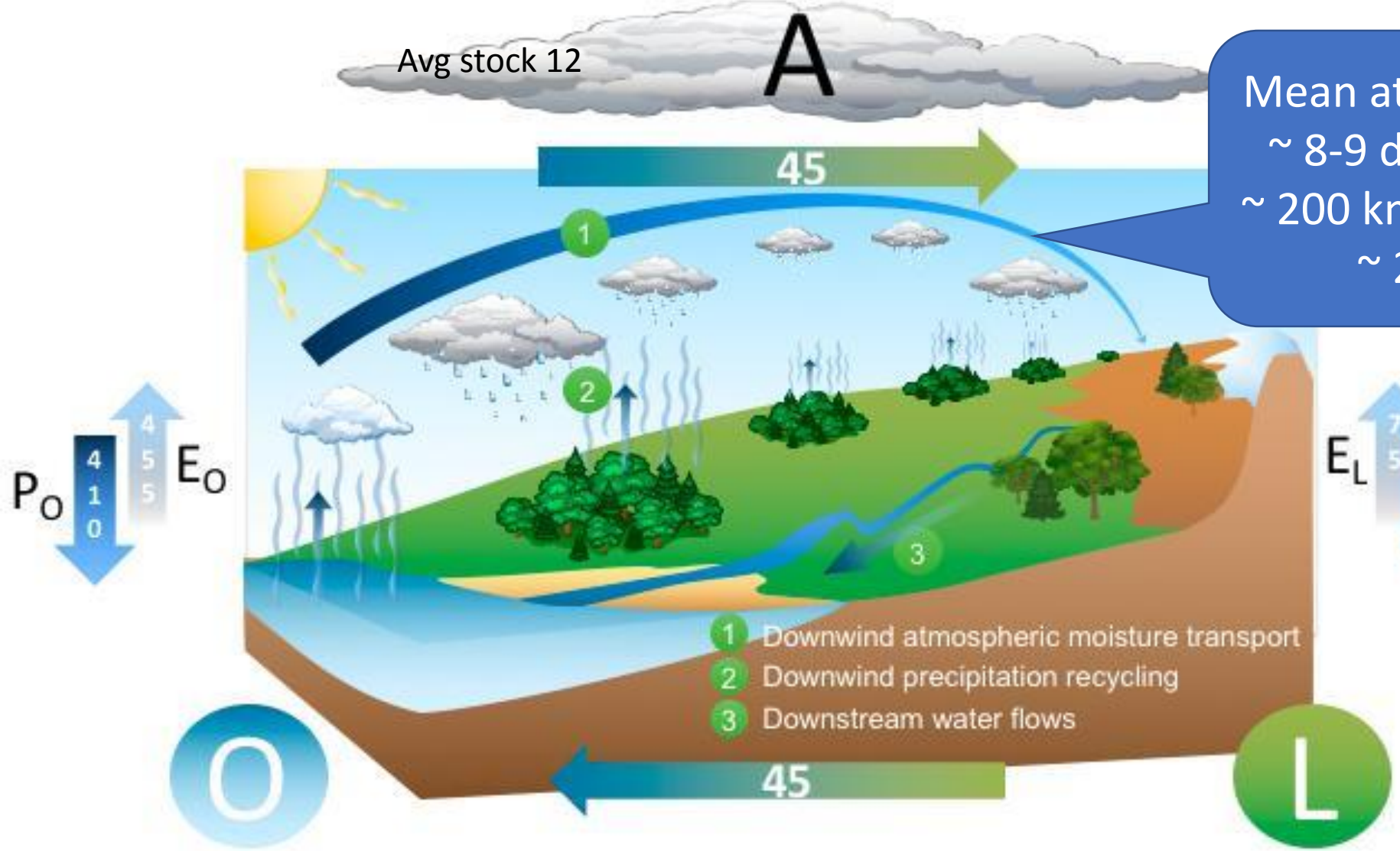

Mean atmospheric residence time ~ 8-9 days[1], implies distances of ~ 200 km downwind at 1 km/hr, or ~ 2000 km at 10 km/hr

1: 12*365/530 = 8.3 d

Achieving the SDGs requires policies that recognise the interactive effects of forests and water. In the absence of such policies, ongoing changes to forests are altering water supplies, and the consequences of these changes are not distributed evenly.

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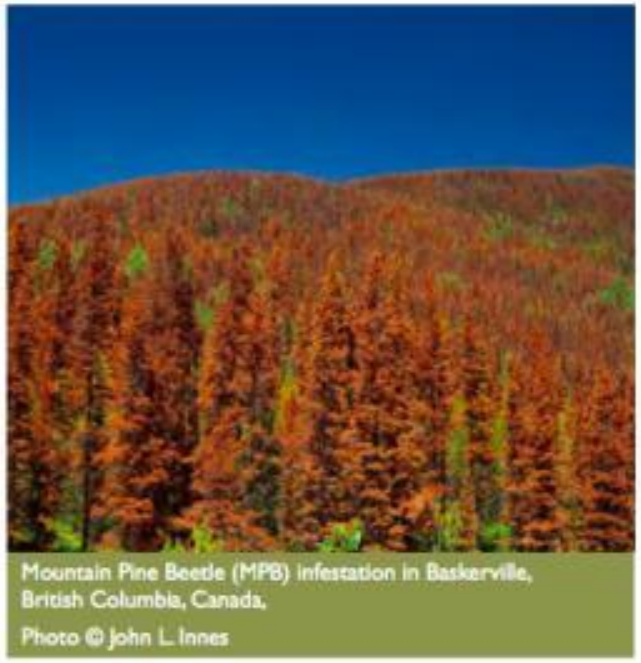
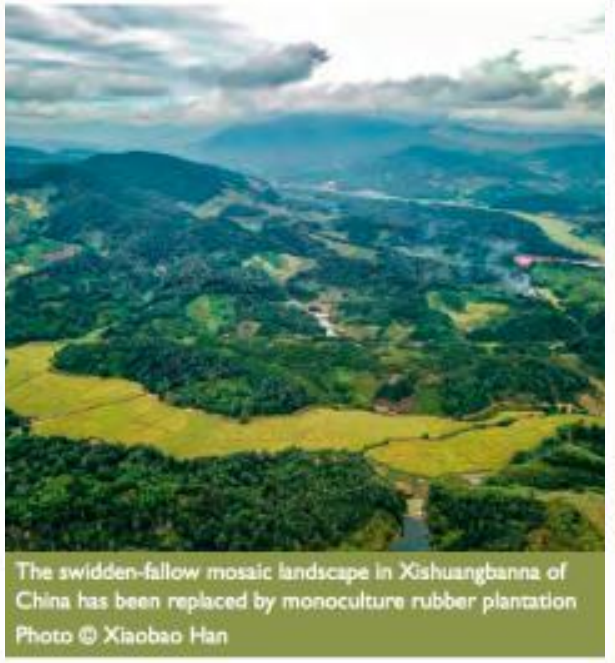
Insight: Forests influence water security, both “upstream” as a source of water in streams and “upwind” as a source of rainfall, and should be managed accordingly. [3] [4]

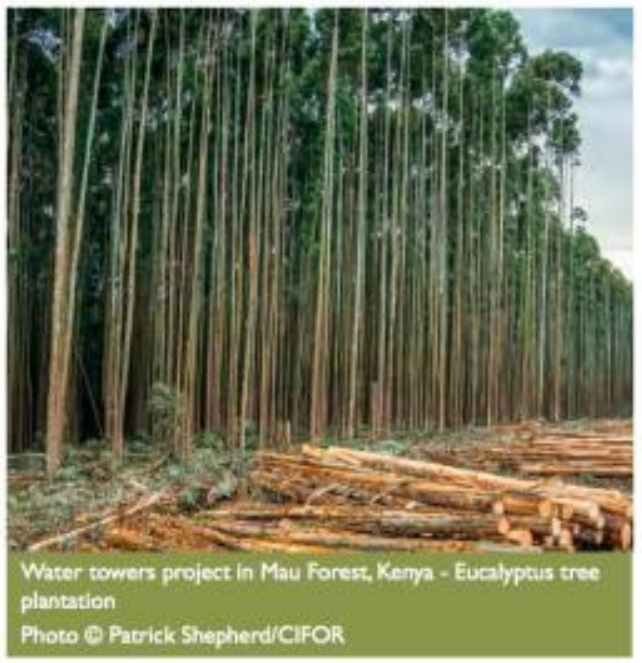
La Tuna wildfire in Los Angeles, CA in 2017
Photo © iStock: Jorge Villalba



Mountain Pine Beetle (MPB) infestation in Baskerville, British Columbia, Canada.
Photo © John L. Innes



The swidden-fallow mosaic landscape in Xishuangbanna of China has been replaced by monoculture rubber plantation
Photo © Xiaobao Han



Water towers project in Mau Forest, Kenya - Eucalyptus tree plantation
Photo © Patrick Shepherd/CIFOR

Natural forests improve resilience of water supply.

Changes – both natural and anthropogenic – in natural forests is undermining this resilience, and this loss in resilience cannot be fully replaced by tree planting efforts.

Protection of existing natural forests and better-informed management of planted forests – particularly under changing climate conditions – are essential.

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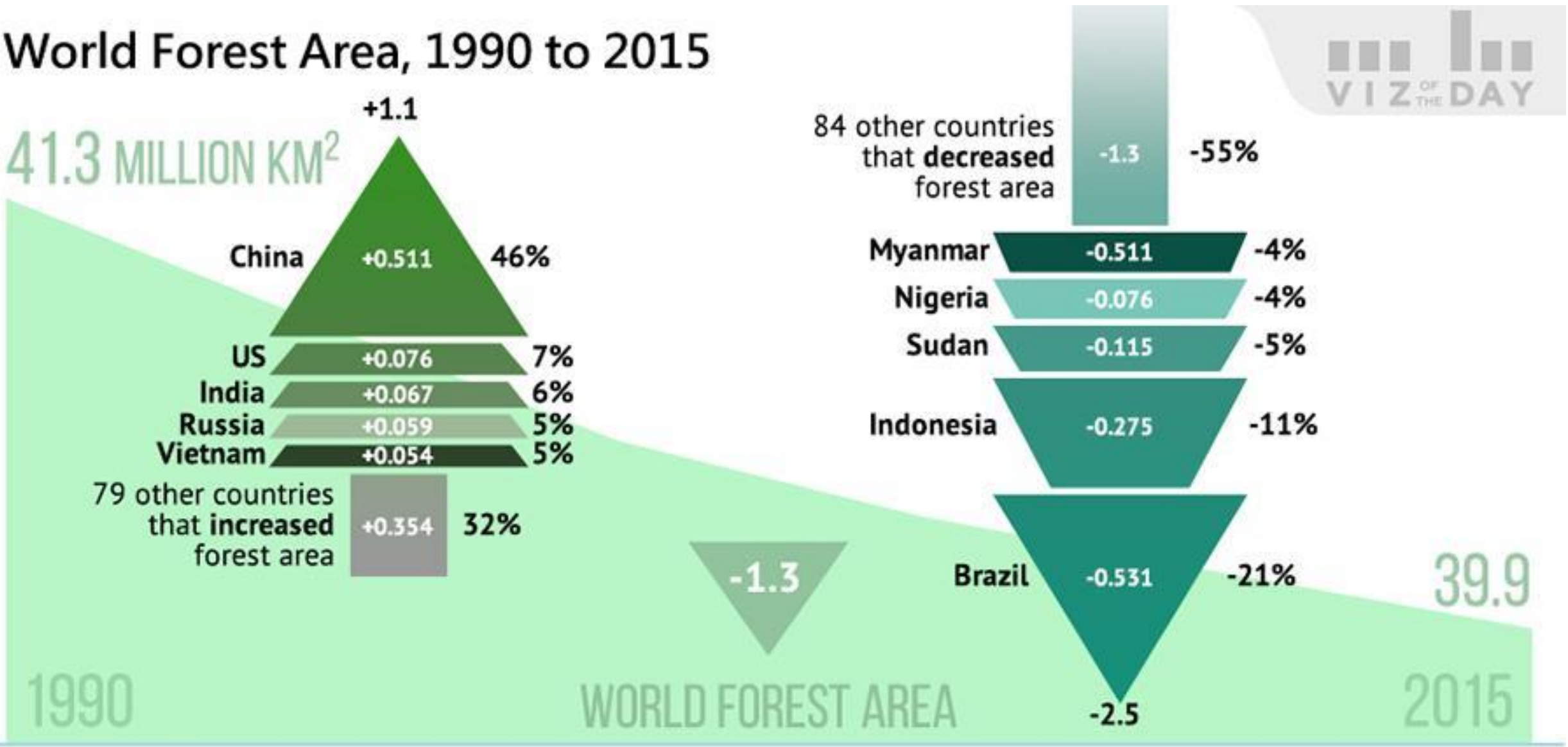
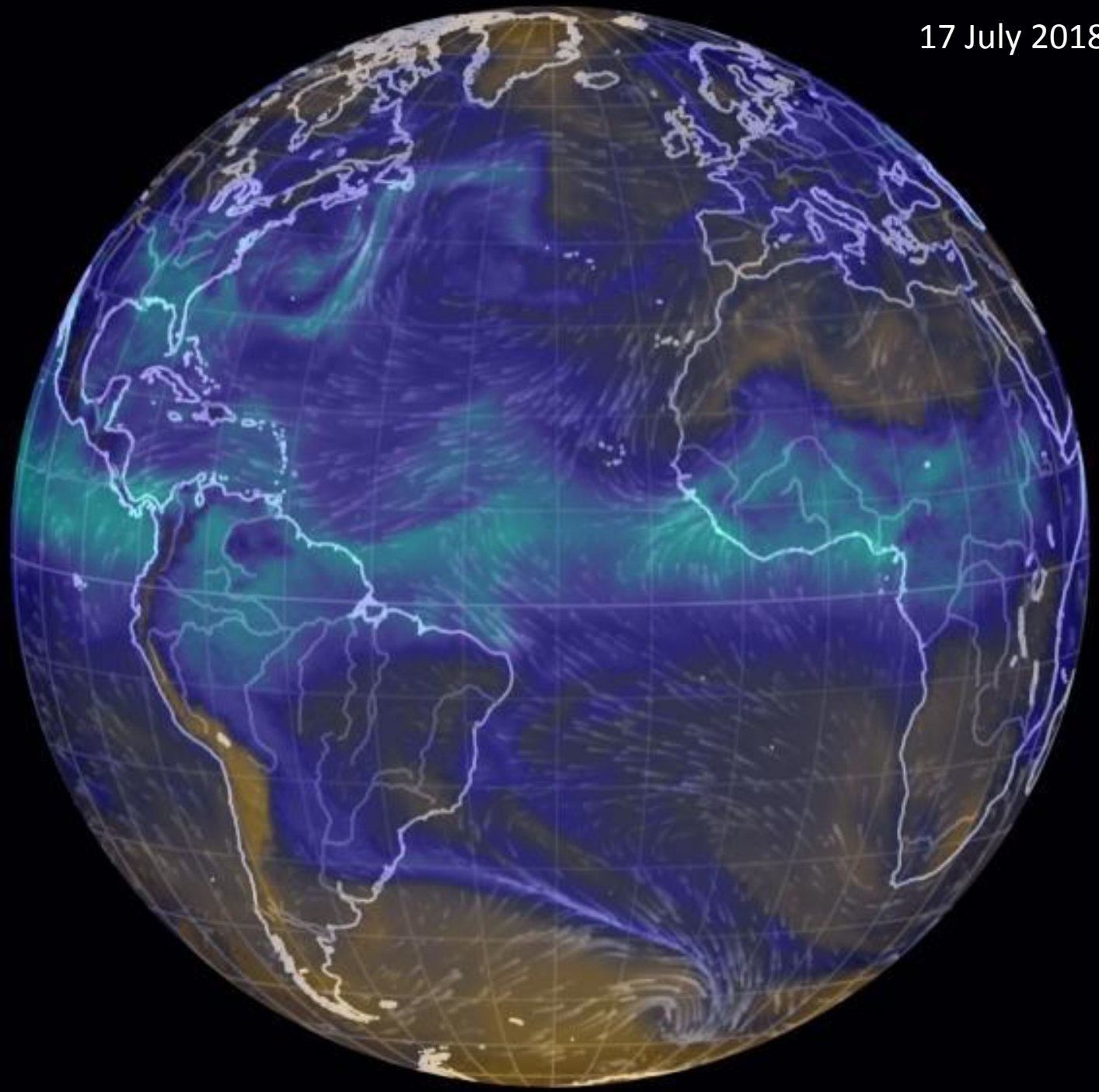
World Forest Area, 1990 to 2015

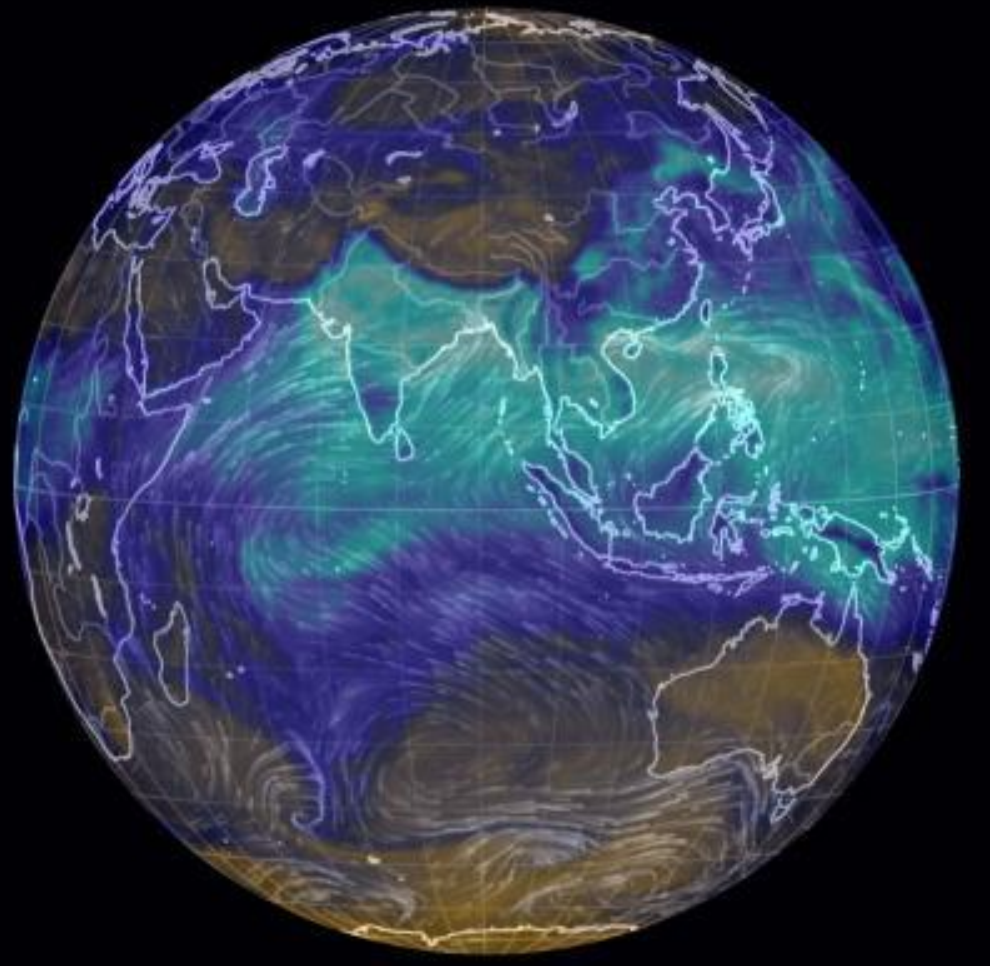


knoema

Source: Food and Agriculture Organization

17 July 2018





https://earth.nullschool.net/#current/wind/surface/level/overlay=total_precipitable_water/orthographic=-30.79,6.27,220

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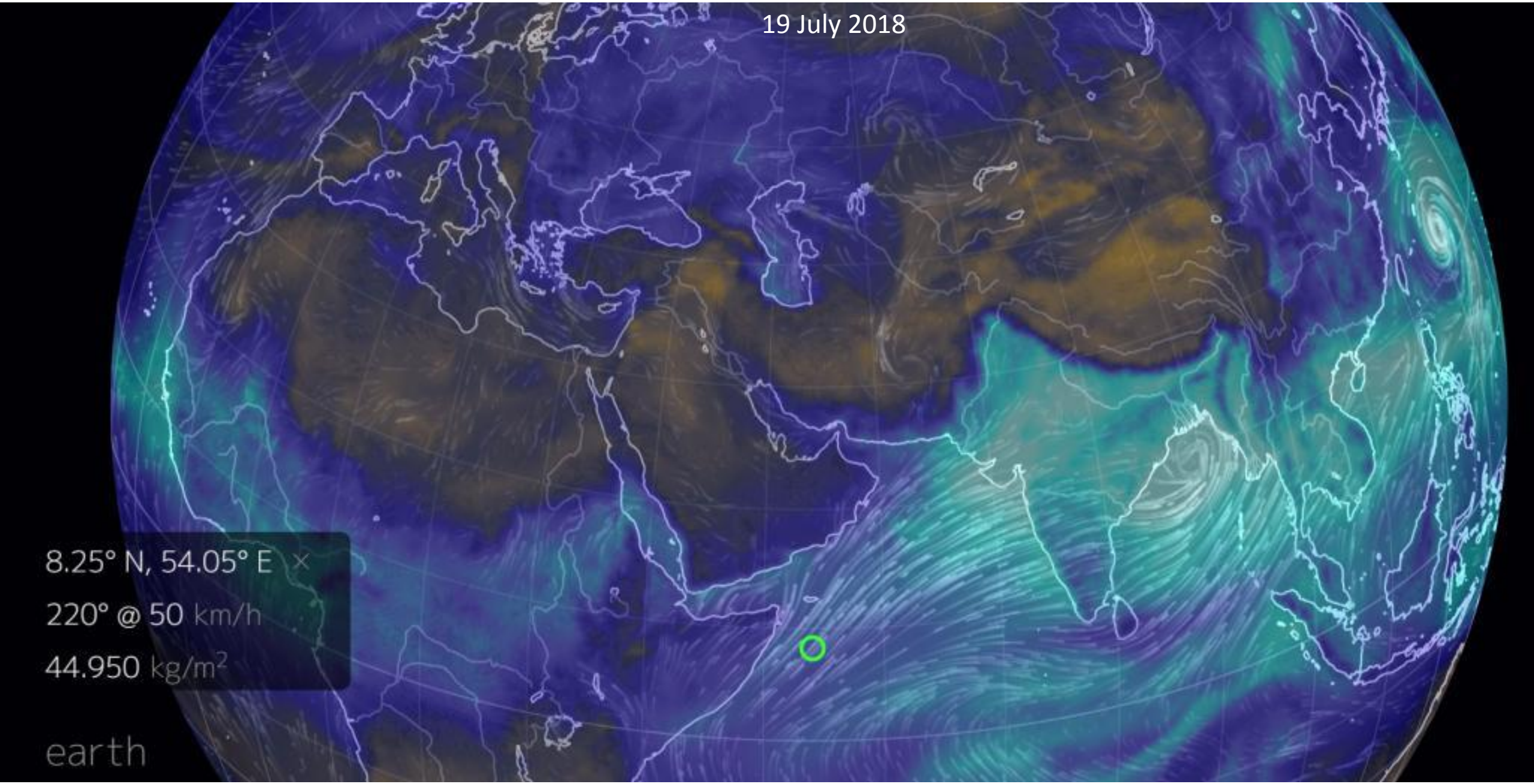
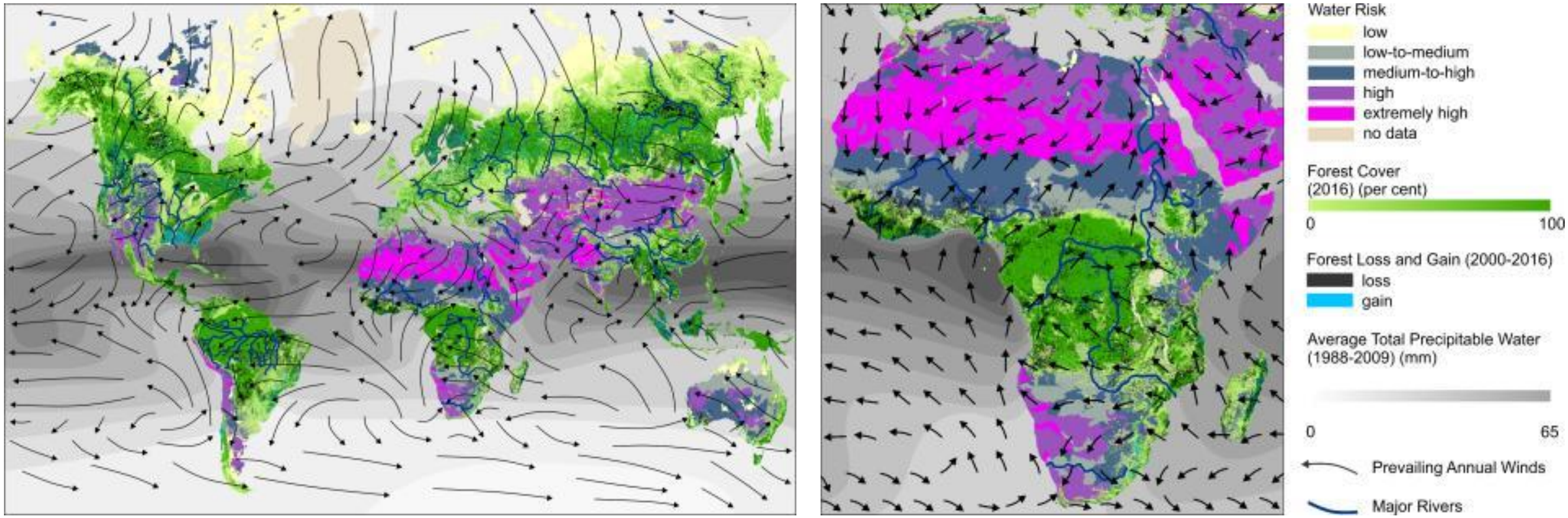

19 July 2018
8.25° N, 54.05° E
220° @ 50 km/h
44.950 kg/m²
earth

Large scale deforestation, reforestation and afforestation efforts may alter how forests transmit water downstream and recycle water downwind.



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Insight: National governments must focus on the role of forests for water (and water for forests), not just forests for carbon. 7

A clear policy gap in climate-forest-water-people relations exists, waiting to be filled.

The role of forests in current climate policy is limited to targets that reduce net greenhouse gas emissions and to increase carbon storage.

Some local-scale efforts to increase carbon storage may reduce local water availability.

Potential water impacts generated by carbon-centered forestation strategies must be considered.

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Insight: National governments should work together on global water governance to ensure resilient and reliable upstream-downstream and upwind-downwind water supplies. 5 6 8 9

New institutional and governance frameworks can play a key role in optimising climate-forest-water management.

- **REDUCE** vertical and horizontal fragmentation of governance between forest and water agencies.
- **EMBRACE** polycentric governance systems, with multiple centers of power and with multiples interacting scales of decision-making.
- **ENABLE** debate, negotiation, and agreement on the optimal strategies for managing the climate-forest-water-people system.
- **ENSURE** social and environmental justice and equity are reflected in policies and practices.
- **INCENTIVIZE** collective action, coordinated action, and sustainable forest and water management will be needed.

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Insight: Outstanding knowledge gaps on the forest-water interactions within the climate-forest-water-people system must urgently be tackled. 10

A series of regional assessments should complement the current global assessment.

But major knowledge gaps need to be filled to inform these regional assessments.

- What are the characteristics of natural and managed forests (e.g., species, ages, densities) that contribute to sustainability of water supply?
- What are the locations of forested areas that are most important as sources of water to ecosystems and to downstream and downwind users?
- What is the uncertainty in forest-water relations as a result of the cumulative effects of climate and land use/land cover changes across geographic regions?
- How are forests and the water that comes from forests are perceived and valued by people?

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Forests can be managed for resilience of water supplies to enable adaptation to global change.

- **ADAPT** forest management practices to respond to opportunities of climate change.
- **PROTECT** and **RESTORE** water towers.
- **FOCUS** forestation efforts in locations where the water supply is relatively abundant and can be removed by evapotranspiration.
- **FOCUS** forestation efforts in locations where the water supply is relatively abundant and where the transpired water can be transported downwind.
- **ESTABLISH** thresholds for forest removal to optimise water budget (recharge, evapotranspiration, discharge) and sustain safe and reliable water flows.
- **ASSESS** site-specific circumstances.

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We need to manage forests for water:

1. **Rethink forests as sources of water**
   Forests contribute to water supplies, both downstream and downwind, at a range of spatial and temporal scales.

2. **Reposition forest-water discussions**
   Forest-water relations must be central to policy discussions at regional, continental and international scales.

3. **Reimagine interventions**
   New institutional and governance frameworks that permit holistic consideration of forests and water are needed to create local policies that support global water security.

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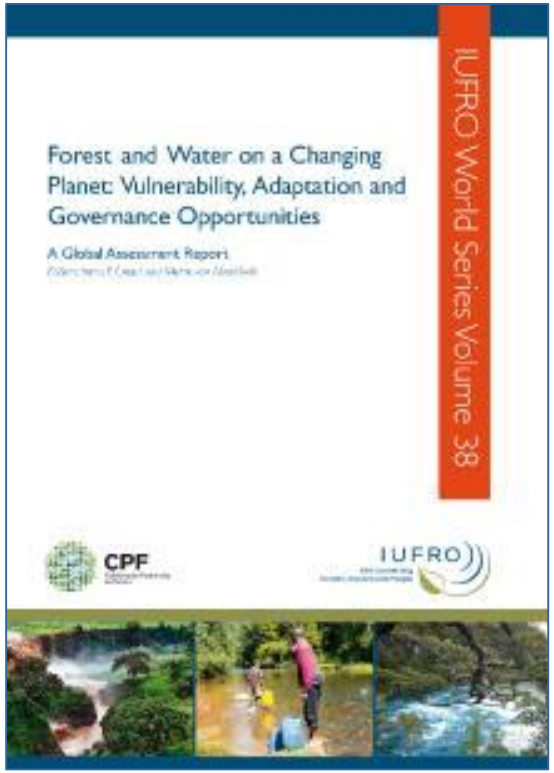
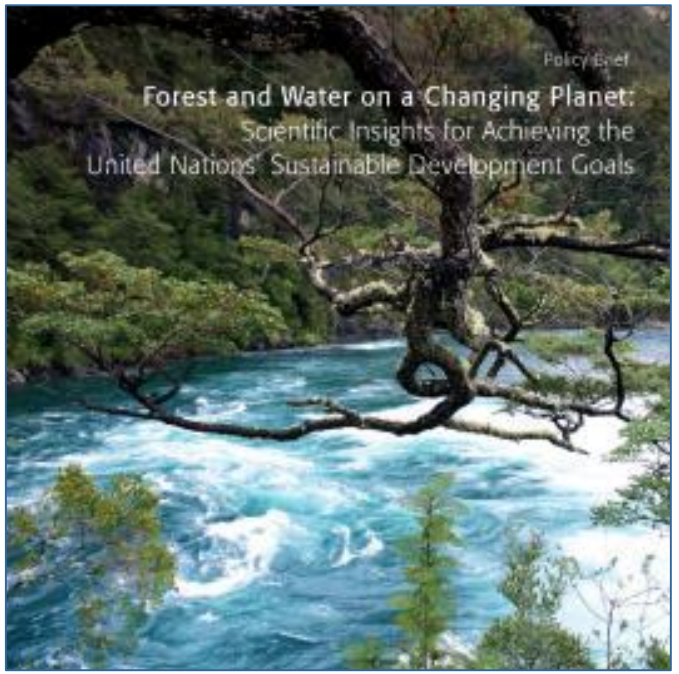
“Forest and Water on a Changing Planet”

The report and policy brief are available
at the official website of GFEP on Forests and Water

https://www.iufro.org/science/gfep/forests-and-water-panel/





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Donors and Supporters

Funding support for this publication was provided by the Ministry for Foreign Affairs of Finland (MFA), United States Forest Service (US-FS), Austrian Federal Ministry for Sustainability and Tourism (BMNT) and World Bank Group/PROFOR:

Special thanks to the Food and Agriculture Organization of the United Nations (FAO), the University of Cambridge, the University of Leeds, and IUFRO Headquarters in Vienna for hosting Expert Panel meetings.

Particular thanks to all the member organisations of the Collaborative Partnership on Forests (CPF):