

**University of Alberta** 

<sup>1</sup>Department of Renewable Resources



# GLOBAL WATER SECURITY, WILDFIRE RISK, AND SOCIETY





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impact

<sup>®</sup>Presenting author \*dwhallem@ncsu.edu Society & Water risk

Hydrological services

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Vegetation cover
Runoff, erosion
Streamflow
Snowmelt
Infiltration
Channel stability
Stream temperature

- Forests provide 40% of the water for the world's largest 100 cities. But, these forests experience increasing threats from wildfires.
- The implications of the coupled wildfirewater supply risk for sustainable development, economy, land management and water governance are not clear.
- Therefore, the challenge is to determine how the coupled wildfire-water risk affects larger water domains, and what the interactions and feedback mechanisms are.

#### Market values

Hydropower, industry Agriculture, aquaculture Flood mitigation

#### Direct risk

Fire suppression cost
Water treatment cost
Hydromodification cost
Pressure on
disaster funds

Short-term
effects
Water budget
Flood risk
Drought risk

Human health

Waterdomain interactions
Non-market

### values

Water quality
Aquatic ecosystem
Recreation, biodiversity
Aesthetic, religious

#### Indirect risk

Water stress
Insurance cost
Watershed
management cost
Sustainability of
freshwater resources

Long-term effects
Species survival
Sediment budgets

Nutrient budgets
Transborder water &
fire management

Left: Central Africa (NASA, 2015). Right: Papua Indonesia (NASA, 2014)
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Hallema, Robinne, & Bladon (2018). Reframing the challenge of global wildfire threats to water supplies. Earth's Future 6(6): 772-776

