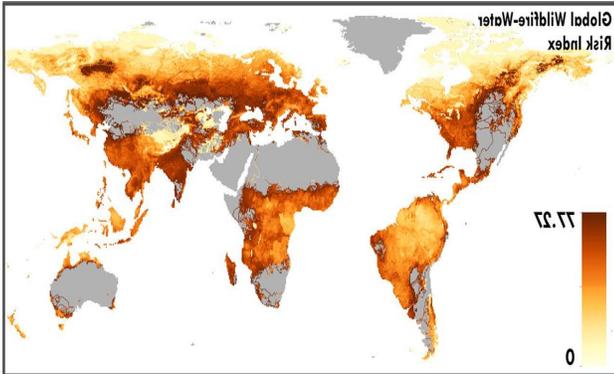




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A spatial evaluation of global wildfire-water risks to human and natural systems



Keywords: fire, fire effects on environment, fire sciences; water and watersheds, Water security, Wildland fire, Natural disaster, Emerging risk, DPSIR framework

Background & Management Issues:

Safeguarding water use for human activities and ecosystems is required for sustainable development; however, no global assessment of wildfire risks on water supply is currently available. Here, we provide the first global evaluation of wildfire risks to water security, in the form of a spatially explicit index.

Project Description: We adapted the Driving forces-Pressure-State-Impact-Response risk analysis framework to select a comprehensive set of indicators of fire activity and water availability, which we then aggregated to a single index of wildfire-water risk using a simple additive weighted model. Our results show that water security in many regions of the world is potentially vulnerable, regardless of socioeconomic status. However, in developing countries, a critical component of the risk is the lack of socio-economic capability to respond to disasters.

Results:

- ✓ Our work highlights the importance of addressing wildfire-induced risks in the development of water security policies.
- ✓ The geographic differences in the components of the overall risk could help adapting those policies to different regional contexts.
- ✓ Severe wildfires may endanger the water supply of human and natural communities.
- ✓ Beyond post-fire hazards, potential impacts and resilience capacities drive the global wildfire-water risk. Wildfire risk to water security can occur globally but may be particularly acute in water-insecure countries.



Management Implications:

- ❖ Understanding why some users don't practice low-impact techniques will improve efforts to change visitor behavior.
- ❖ The assumption that non-complying users simply don't know about low-impact techniques is not always correct. A wide range of factors influence noncompliance with low-impact techniques.
- ❖ Persuasive strategies to change behavior will be more effective if those strategies are developed in response to the specific factors that limit compliance. For example, if correct interpretation of the situation seems to be problematic, managers could emphasize educational efforts focusing on correctly reading the environment.
- ❖ Minimizing ambiguity in communicating low-impact recommendations increases the chance that users will feel social pressure to comply with low-impact techniques.

Publications / Products:

- ❖ Borrie, William T., and Harding, James A. 2002. Effective recreation visitor communication strategies: Rock climbers in the Bitterroot Valley, Montana. Research Note RMRS-RN-15. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 11 p. **Leopold Publication Number 503.**
- ❖ Borrie, William T.; Harding, James T. 2001. Basic Knowledge of Factors that Limit the Practice of Low-impact Behaviors. Draft report on file at: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Aldo Leopold Wilderness Research Institute, Missoula, MT. 183 p. **Leopold Unpublished Report Number 100.**
- ❖ Harding, James A.; Borrie, William T.; and Cole, David N. 2000. Factors that limit compliance with low-impact recommendations. *In:* Cole, David N.; McCool, Stephen F.; Borrie, William T.; O'Loughlin, Jennifer, comps. Wilderness science in a time of change conference Volume 4: Wilderness visitors, experiences, and visitor management; 1999 May 23-27; Missoula, MT. Proceedings RMRS-P-15 VOL-4. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 198-202. **Leopold Publication Number 392.**

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