

# Water-Energy Nexus



## Learning Objectives

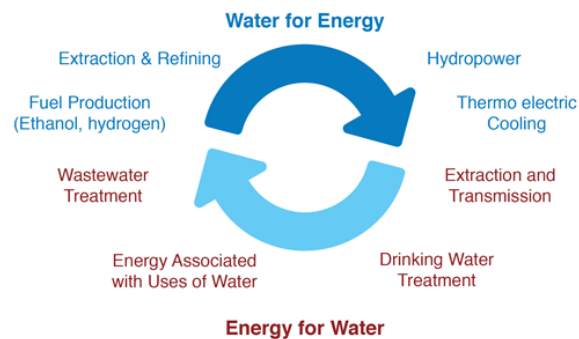
- 1. What is the Water-Energy Nexus?
- 2. Mackenzie Basin Example
- 3. Future Concerns

Geog 412

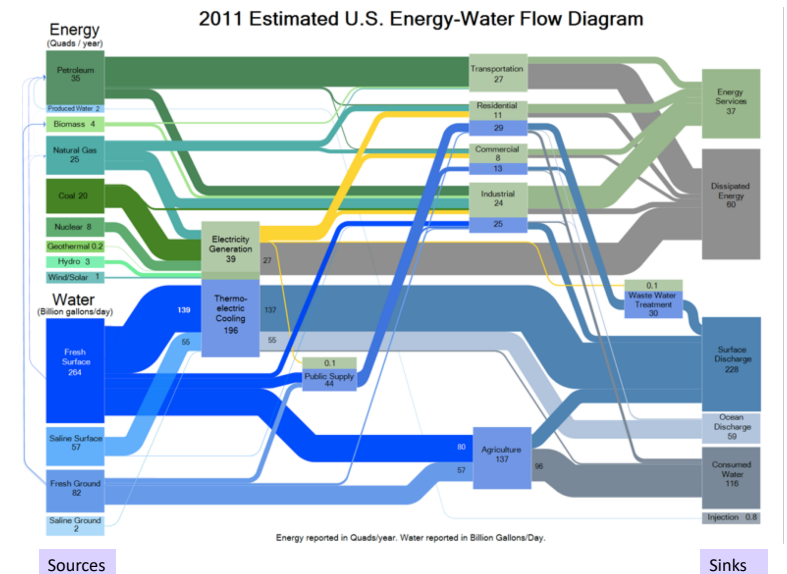
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# Water-Energy Nexus



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[Image: Bauer, D., Philbrick, M., Vallario, B., Battey, H., Clement, Z., & Fields, F. (2014). The Water-Energy Nexus: Challenges and Opportunities. *US Department of Energy* 2014, p. vii]

## Central Concepts

- Broader understanding of water-energy nexus **beyond consumption** (ie. input/output equations)
- **Multi-tiered jurisdictional levels** for the management of energy-water resources (laws, policies, organizations).

Scott, C. A., Pierce, S. A., Pasqualetti, M. J., Jones, A. L., Montz, B. E., & Hoover, J. H. (2011). Policy and institutional dimensions of the water–energy nexus. *Energy Policy*, 39(10), 6622-6630.

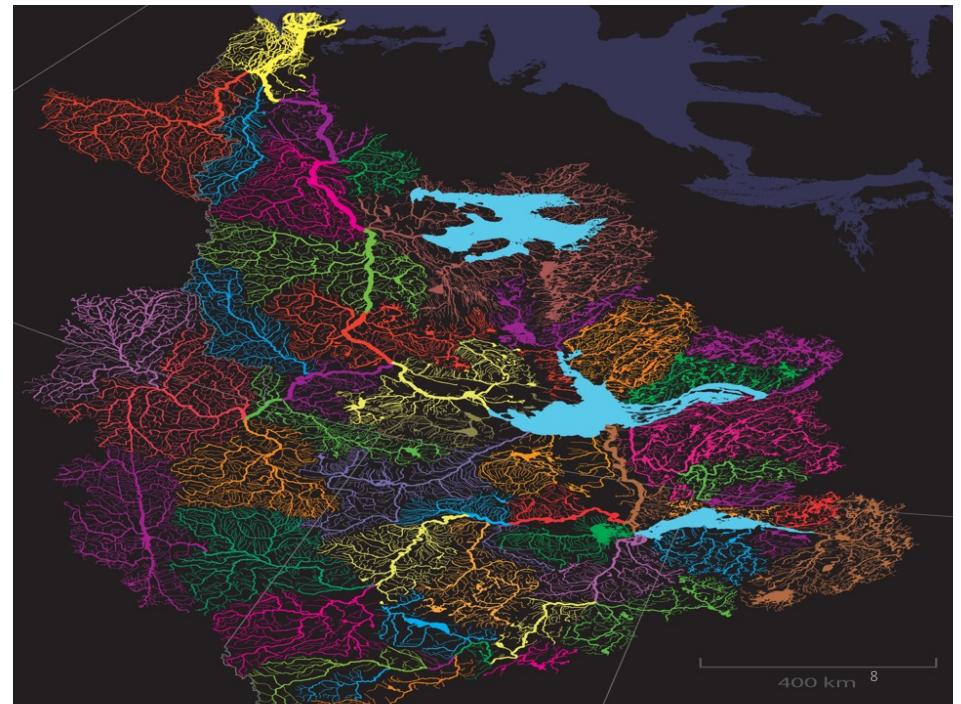
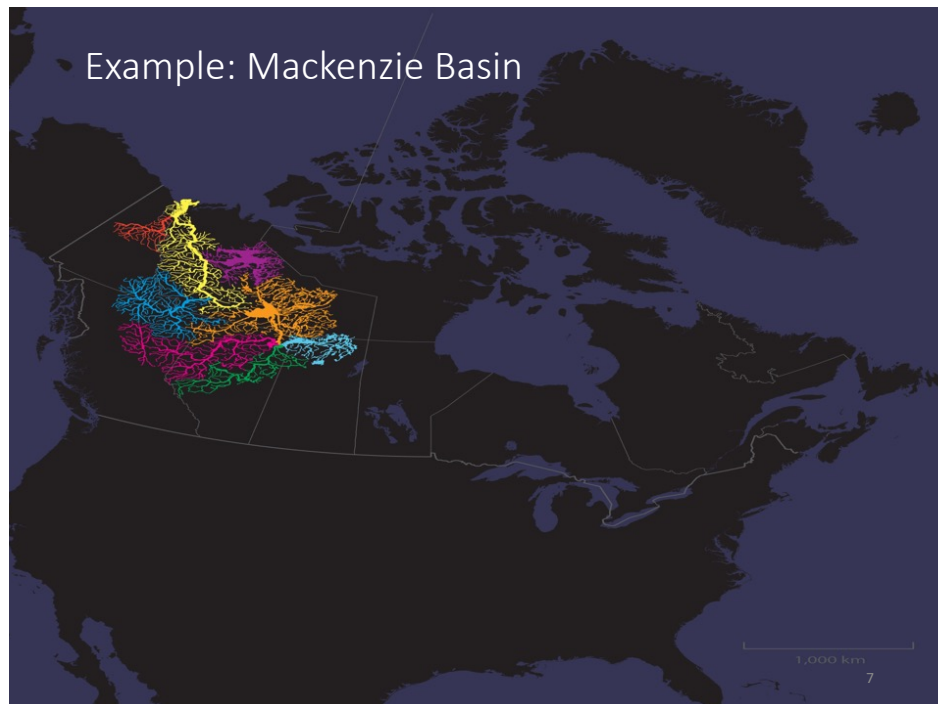
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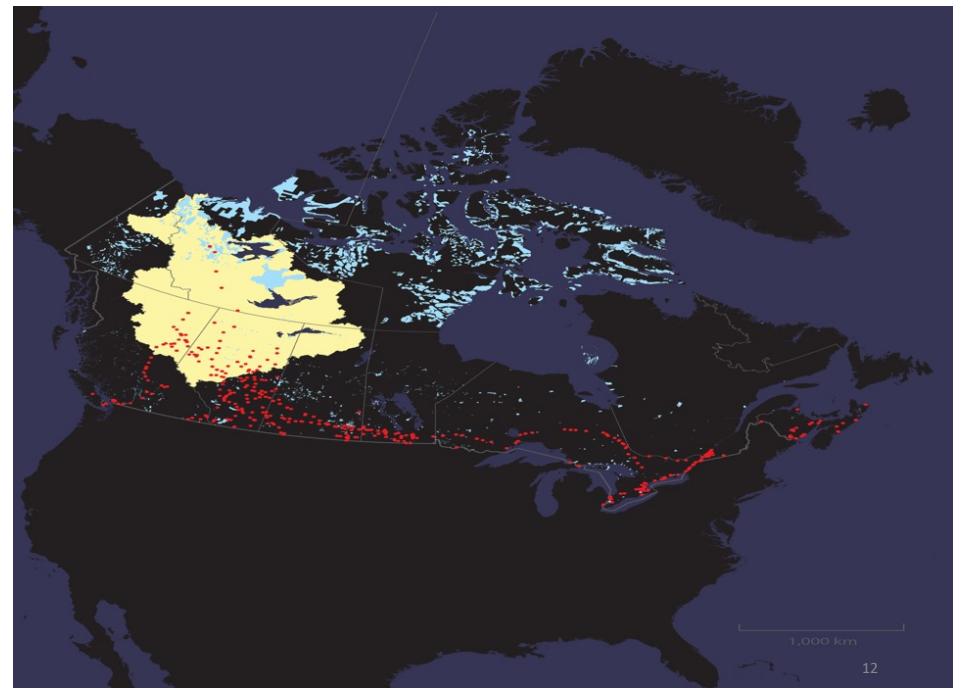
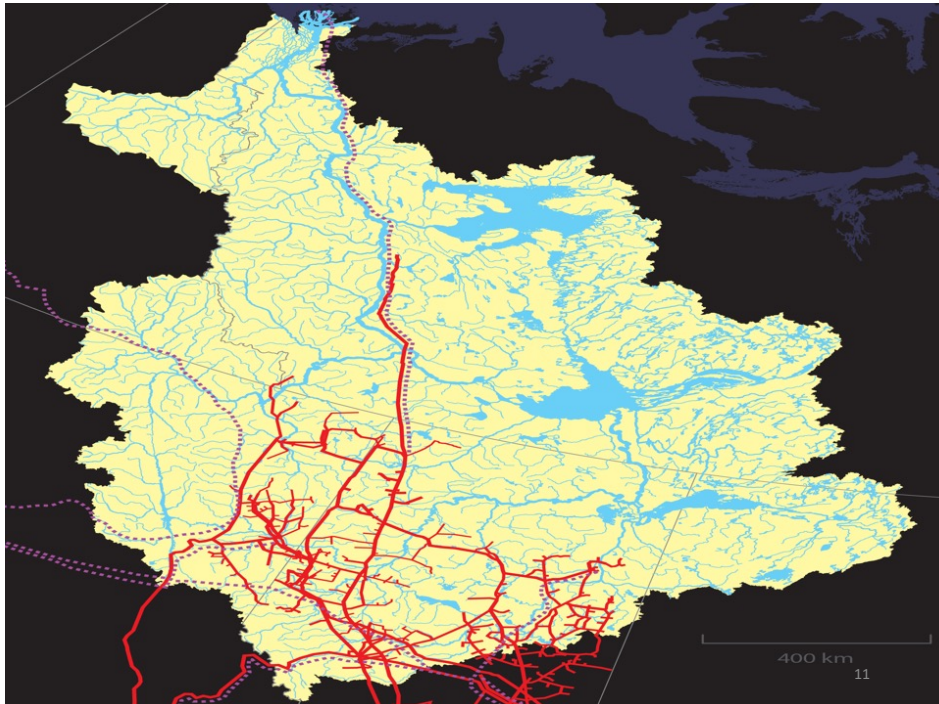
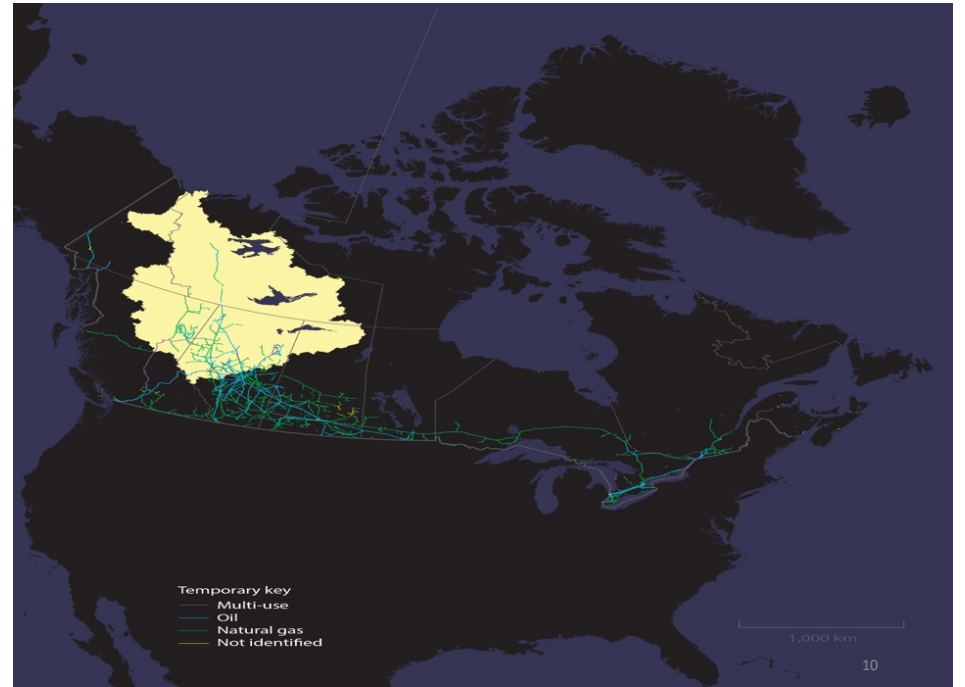
## Considerations for Water-Energy Policy

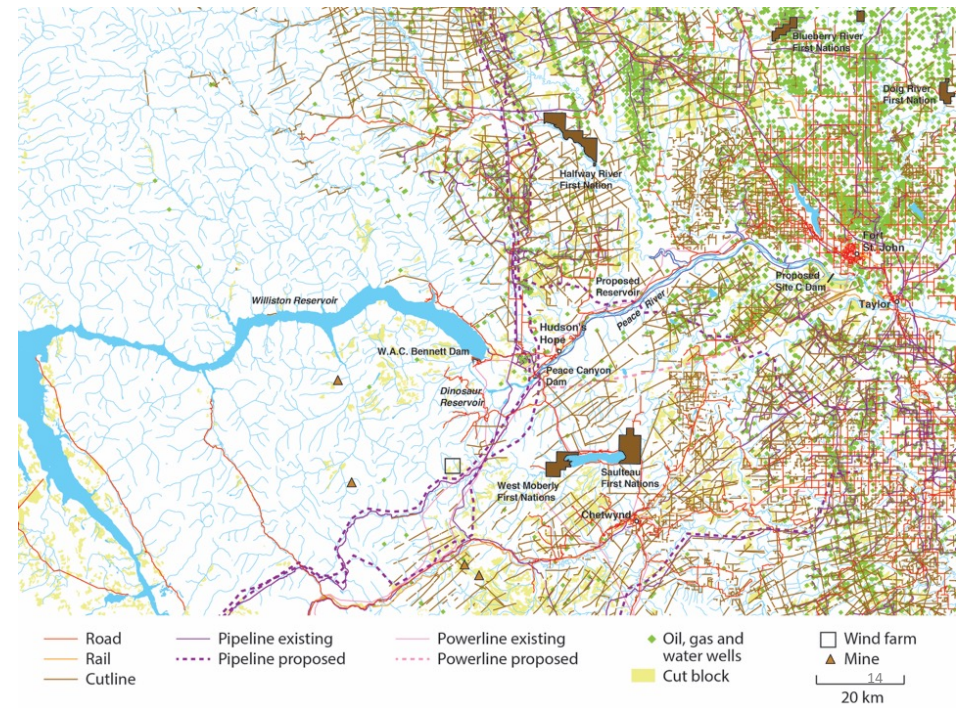
- Consider decision-making, resource governance, policy, and global-change adaptations.
- Complex – alternatives and scenarios can inform policy
- Pluralistic viewpoints– need stakeholder interaction
- Discrepancies between local and national perspectives – spatial dislocation
- Improved coordination between water and energy policy

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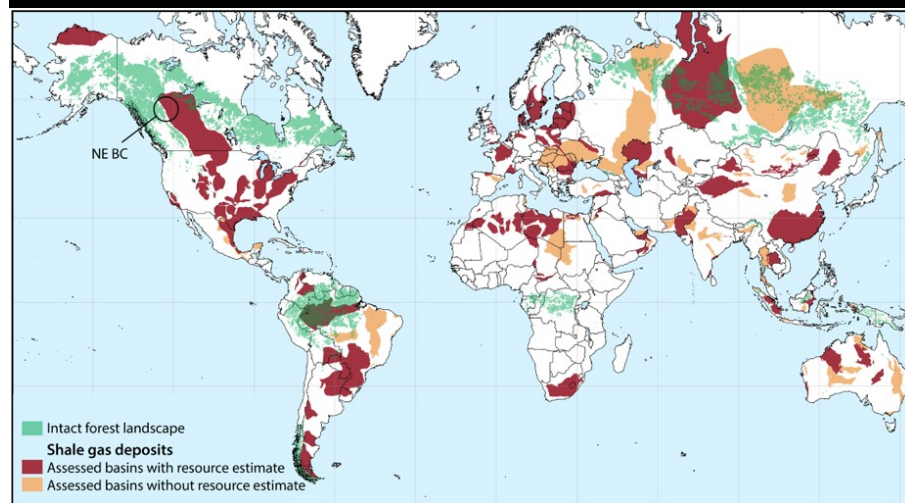
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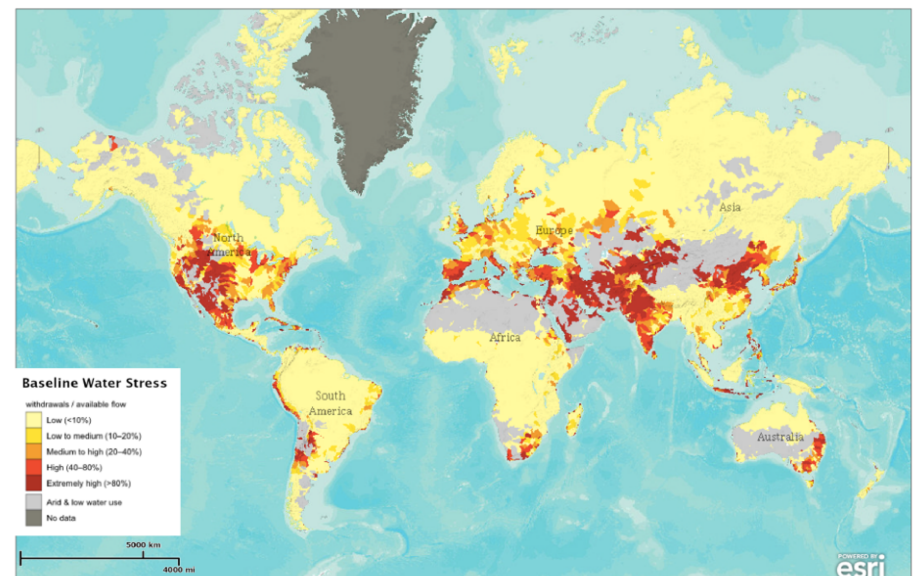


## Water-energy nexus



[Image: Potapov, P. et al. 2008. Mapping the world's intact forest landscapes by remote sensing. Ecology and Society 13(2): 51.]

## AQUEDUCT



Data provided by: WORLD RESOURCES INSTITUTE

[Map: World Resource Institute: <http://www.wri.org/blog/2015/08/ranking-world%E2%80%99s-most-water-stressed-countries-2040>]

## Challenges

- Increasing demands on finite water resources and energy services, population growth, and migration.
- Risks of climate change and extreme events
- Threat to energy security
- Need policymakers to consider water-energy nexus
- Many decision makers involved
- Water pollution (renewable but finite resource)
- Balancing uses for humans and non-humans

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## Opportunities

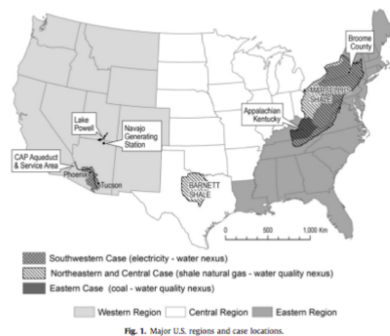
- Optimize water and energy with new technologies
- Multi-scale cooperation
- Demand management



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## Reading

Scott, C. A., Pierce, S. A., Pasqualetti, M. J., Jones, A. L., Montz, B. E., & Hoover, J. H. (2011). Policy and institutional dimensions of the water–energy nexus. *Energy Policy*, 39(10), 6622-6630.



[Image: Scott, C. A., et al. (2011) p. 6625]

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