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DAVE HUER

28-Jun-14

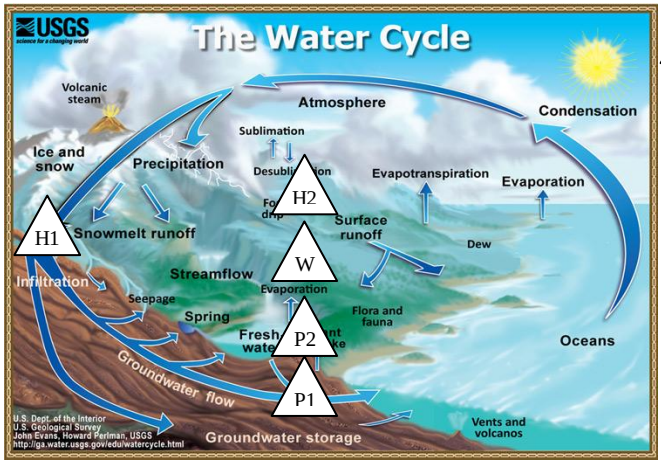
Aquifer "Float Rights"

Governments lease, allocate, and surrender land rights that are divided into air rights, surface rights, and subsurface rights. Water conflicts are enormously challenging when viewed simply as surface and subsurface resources. When Pacific winds carry moisture-laden air to the Sierra Nevada Mountains, no one argues that this vapour has private value; nor water flowing in public lands. Common assets are public property. It is only when liquid water passes over or is pumped from private land is it considered a private asset.

Many regions overuse aquifer resources; and water management is especially problematic because water property rights are determined by the Federal, International Treaty, State or Provincial jurisdiction where the water resides. For example, "California has laws governing surface water usage and quality, (but) there exist no statewide groundwater management laws. Each groundwater basin is individually adjudicated to determine water rights. Otherwise, for all practical purposes, land ownership implicitly carries the right to virtually unlimited groundwater pumping."[1] A stark example of the "tragedy of the commons".[2]

Could we use the "Float Rights" concept[3]—the anticipated value of a publicly-owned resource—to change the perspective? Could we *use* the hydrological cycle? The hydrological system is a closed loop. "Private" water inevitably becomes public later in the cycle, so it could be argued that private rights are for a % of the allocation, and the waste of any percentage of that right is a misuse of future public resources. Water *value* changes during the hydrological cycle. Could we use this as a "*hydrological spread*" (a financing spread) to minimize water waste?

Could we use the *anticipated future vapour value of wasted public liquid water* to encourage and reward waste prevention? Would an Anticipated Value Framework simultaneously protect private and common rights, create water-saving market incentives—and demand for new technology tools to help property owners earn tax credits?



Sample Calculation using *Hydrological Spread* Concept

H1	Usable Hydrological Spread ("HS") per Gal.	100%
P1	% of Allocation Pumped	75%
P2	% of Allocation Unused	25%
	"Minimized Waste Achievement" Last Month	
	– Certified Pumps, Fittings, Maintenance	1%
	– Corrosion-Free Pipes & Liners	1%
	– High Seal Evaporation Covers	25%
	– Cleaned & Recycled/Returned Waste Water	15%
W	**Net Prevented Waste = (Spread Baseline)**	42%
H2	Net Return to HS (NRHS) = P2 – (P2 x W)	14.5%
	NRHS x Monthly Tax Credit Mill Rate	$credit

[1] http://en.wikipedia.org/wiki/Water_in_California

[2] http://en.wikipedia.org/wiki/Tragedy_of_the_commons

[3] http://davehuer.com/bcitfolio/innoprojects/inno-images/inno-details/huer-oil-sands-float-rights.pdf

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Outcomes for Government & Policy Sector

- Hydrological Spread Value split into three asset types:
  - Anticipated value of public resource: *("Water Float Right")*
  - Actual value of public extracted resource: *("Public Liquid Right")*
  - Actual value of private extracted resource: *("Private Liquid Right")*
- Effect on credit rating of public and private water rights holders
- Tax Policy, Conservation Law, and Legislative Actions

Outcomes for Private Landowners and Industry

- Effect on water finance market (tradeable as new spot market segment)
- "Zero Waste" Target (pollution prevention of extractable resource) becomes value-added activity
- "Zero Loss" Target (preventing waste/evaporation during human extraction) becomes value-added activity
- Owners could profitably lease, sell, or leverage the anticipated value of their static asset rights, and could improve the value (leverageable spread) of that right by minimizing groundwater allocation waste
- Owners could cut their taxes or water right costs by minimizing water loss
- Float Right Licensee does not necessarily have to be Liquid Right Licensee

Numerous spin-offs for supporting industry

- Cyberinfrastructure
- Digital technology
- Emerging technologies
- Energy technology
- Environmental technology
- Lubrication & Machinery
- Microtechnology & Nanotechnology
- Spraying & Drilling techniques
- Radio technology
- Remote sensing technology
- Waste treatment technology
- Feasibility & global benchmarking studies
- Supply-chain design & risk analysis
- Real Estate & Resource Tenure Consolidation
- Site Modeling & geotechnical engineering
- Earthworks, drainage & stormwater management
- Site Planning, Grading & Utility Development
- Construction / Post Construction Management
- Erosion and Sedimentation Pollution Control
- Integrated logistics for capture mapping
- Extraction vapour loss monitoring
- Information technology

Remote Sensing – Industry Drill-Down Example

- Remote sensing of royalty properties
- Monitor outgassing as royalty value capture/loss ratio
- Build the tool and partnerships, test locally, leverage globally
- Data flows could post to spot market (ie. data reports affect materiality)
- Develop Stock Trading Data Board to leverage the data for capital markets reporting
- Leverage tool to monitor other outgassing properties for a variety of customers

Image sources: US public domain (US Geological Survey).