Peak Water: The Next Oil? Unlocking Solutions to the World's Water Crisis

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Pacific Institute
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The Water “Crisis:” What is it?

Peak Water?

Water and Business Risks

Water and Business Opportunities

Solutions for the New Century

The Water Crisis: What is It?
Global and Regional Challenges

- The failure to meet basic human needs
- Water-related diseases
- Local water scarcity and resource depletion
- Water contamination
- The effects of climate change and extreme events
- Challenges to the production of food, goods, and services
- Ecosystem degradation and destruction
- Threats to national and international security

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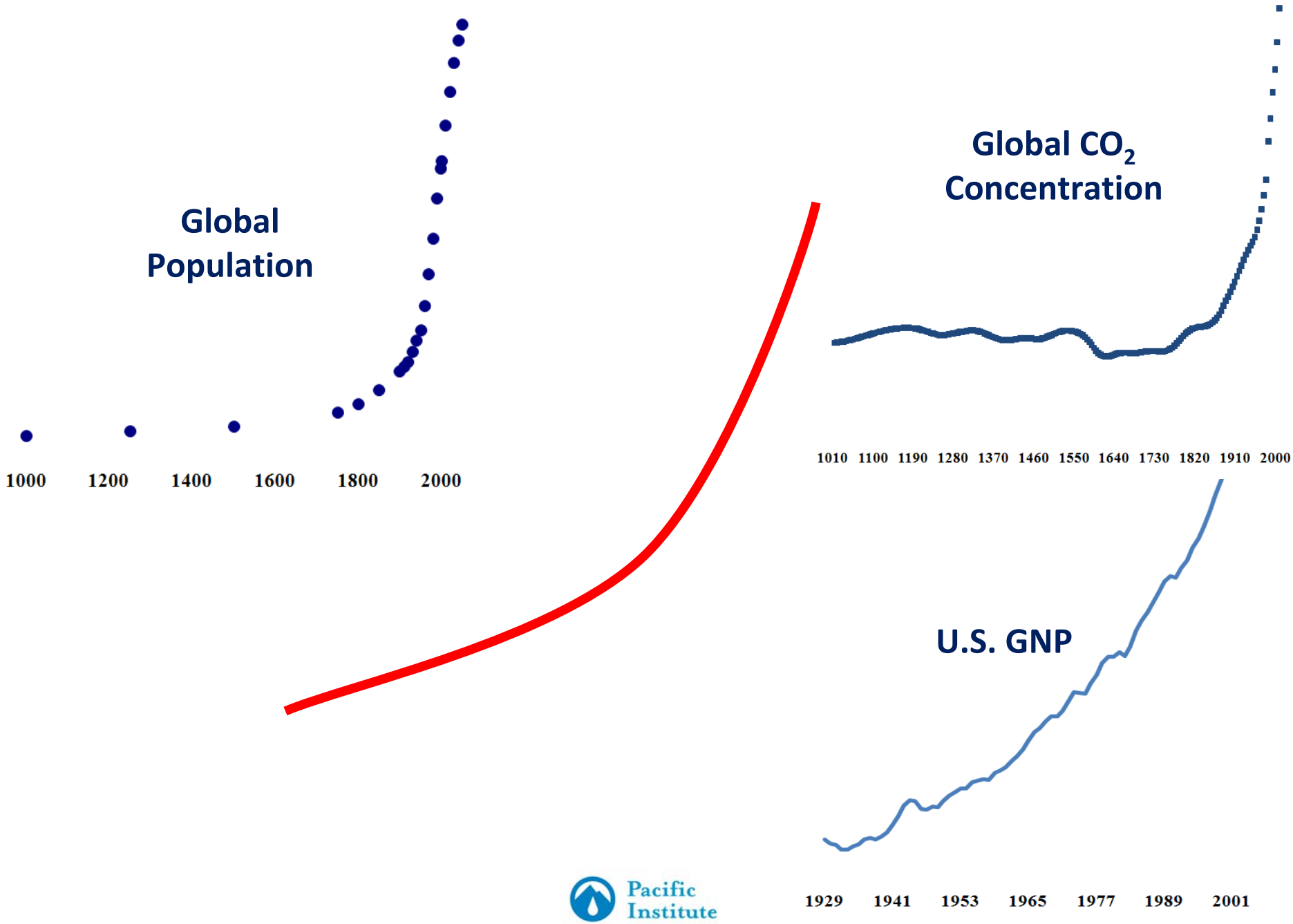
“Peak Water” in Three Easy Shapes


Global Population
1000
1200
1400
1600
1800
2000
Global CO_2 Concentration
1010
1100
1190
1280
1370
1460
1550
1640
1730
1820
1910
2000
U.S. GNP
1929
1941
1953
1965
1977
1989
2001
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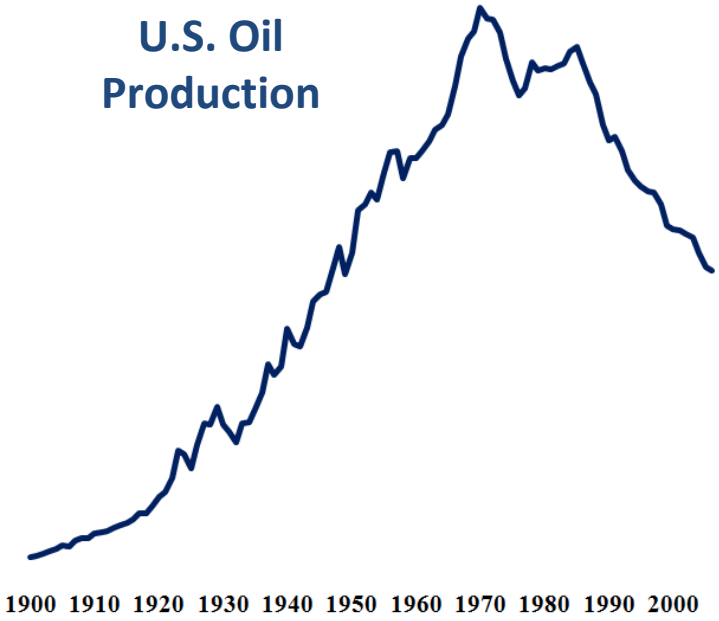

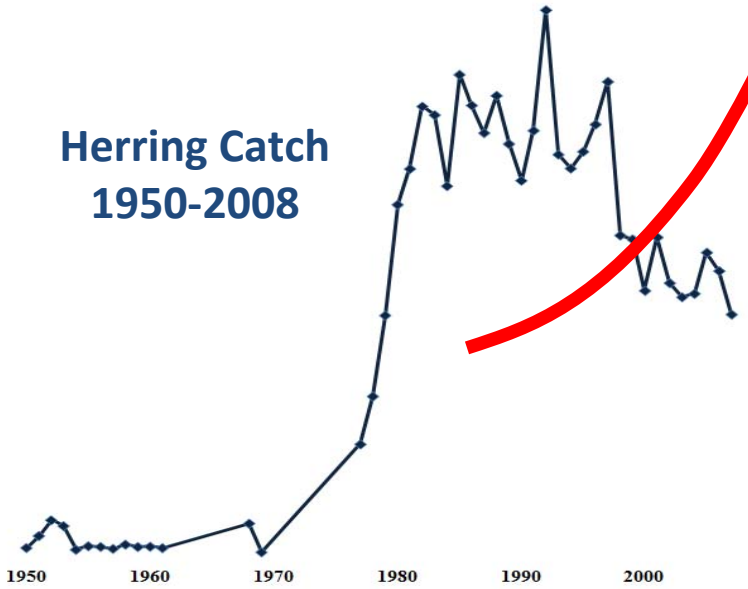

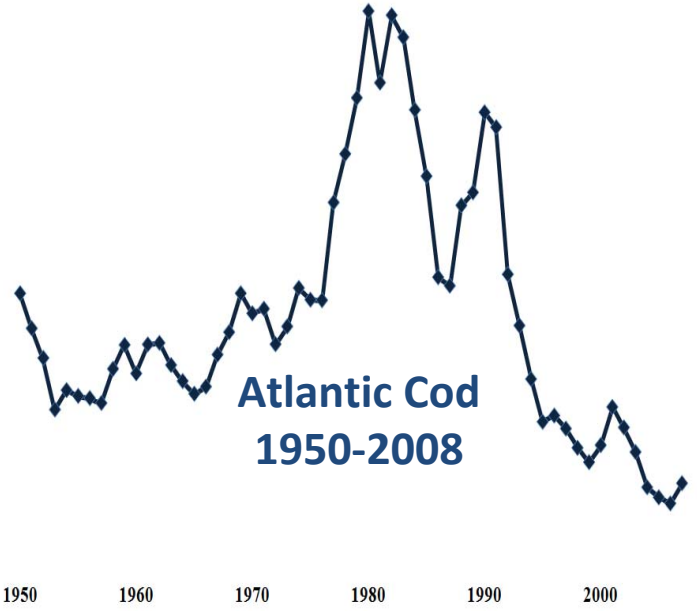

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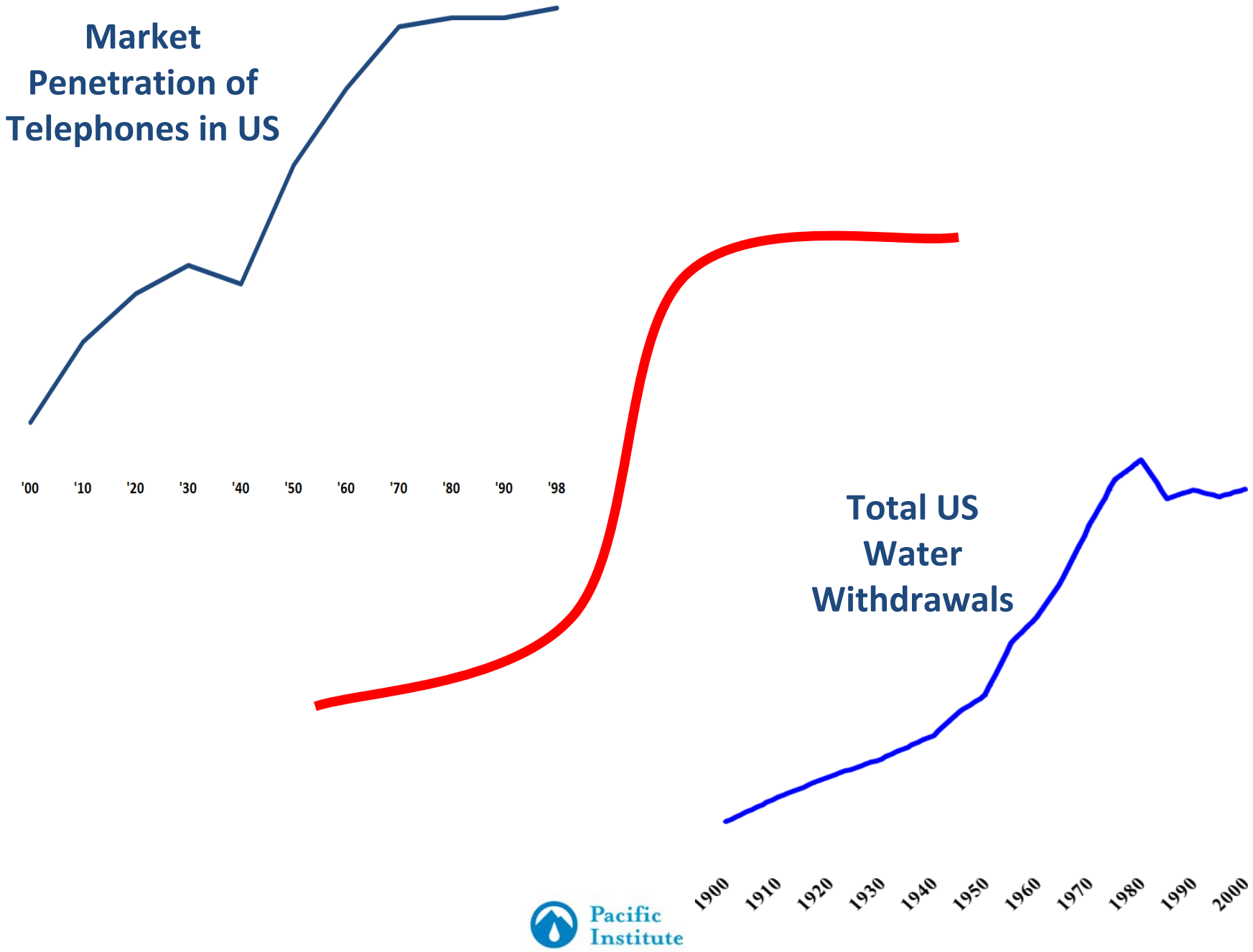
Market Penetration of Telephones in US
'00
'10
'20
'30
'40
'50
'60
'70
'80
'90
'98
Total US Water Withdrawals
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
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Oil and Water

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Oil and Water: Selected Characteristics

Characteristic	*Oil*	*Water*
Quantity?	Finite	Literally finite, ***but*** unlimited (at a cost)
Renewable or Non-Renewable?	Non-renewable	Renewable, ***but*** with locally non-renewable stocks
Transportability?	Long-distance transport economically viable	Long-distance transport ***not*** economically viable
Substitutability?	Wide range of alternatives can substitute	No substitutes for most purposes

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Renewable or Non-Renewable?

- Non-renewable resources are "stock" limited.
- Renewable resources are "flow" limited.

- Water uniquely exhibits characteristics of both: overall renewable but with some fixed, isolated non-renewable stocks.

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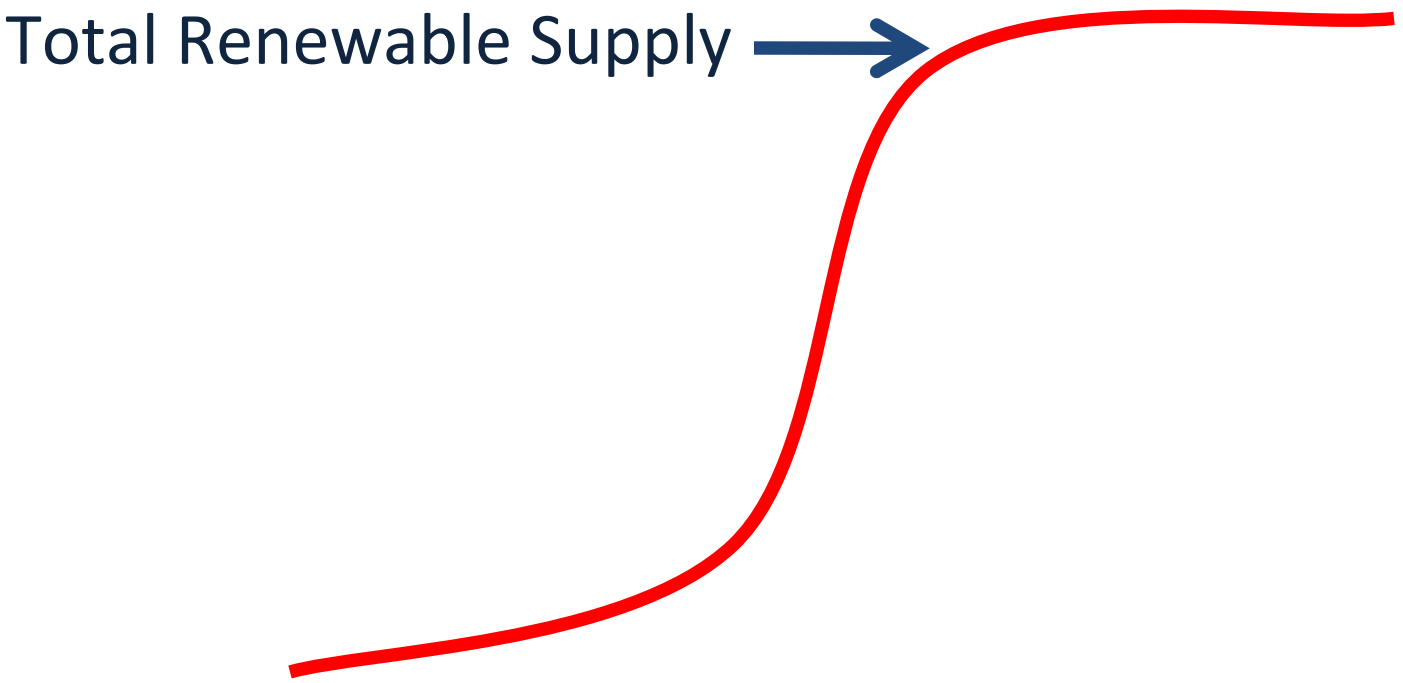
Peak Renewable Water



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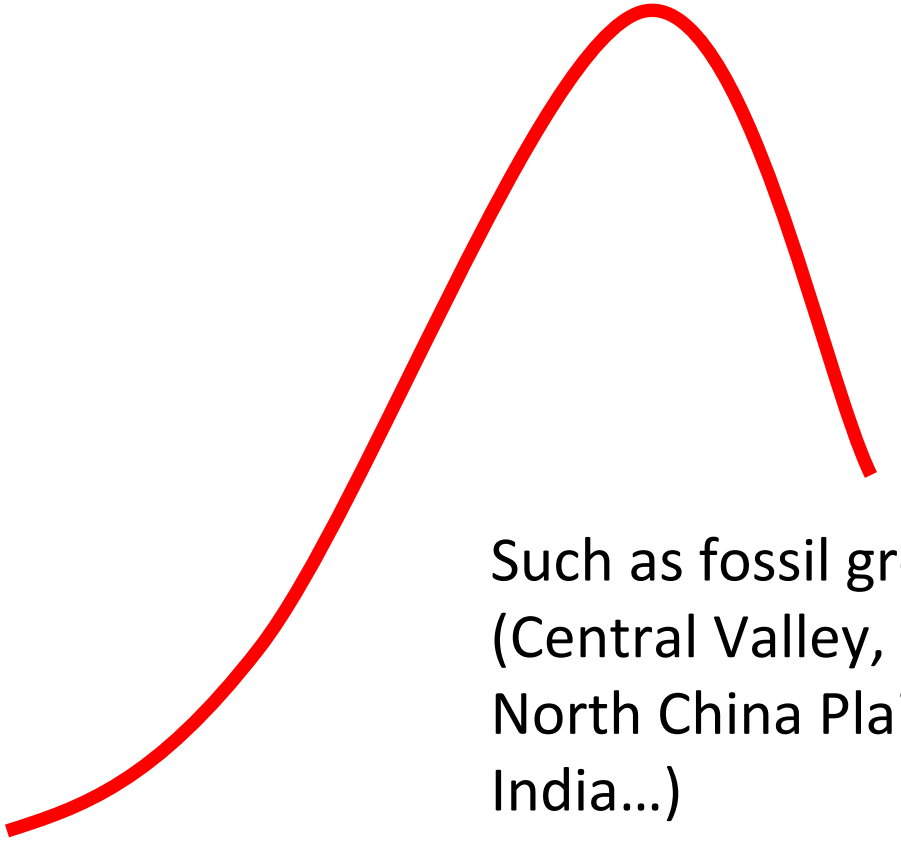
Peak “Non-Renewable” Water



Such as fossil groundwater (Central Valley, Ogallala, Libya, North China Plains, central India…)

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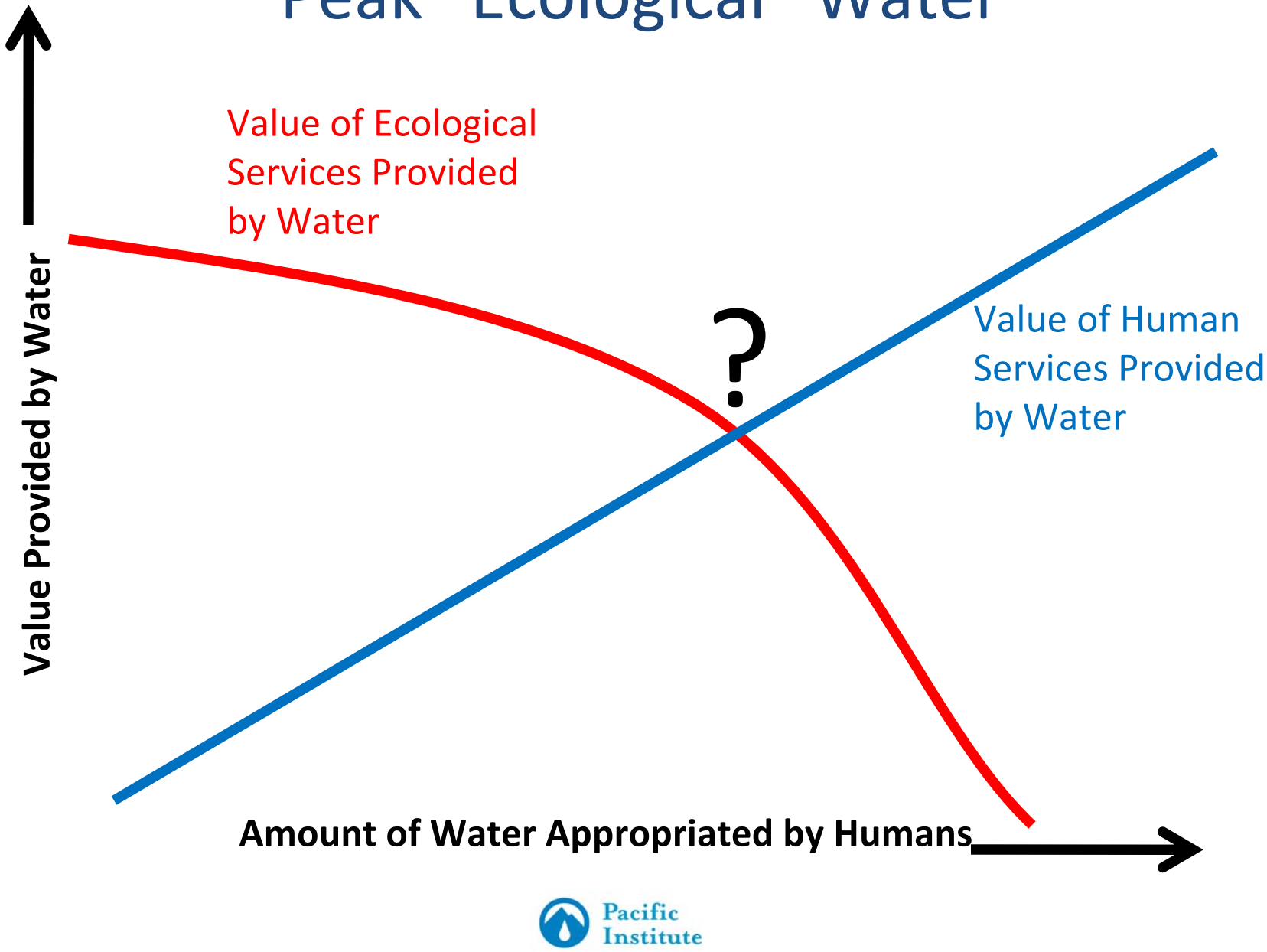
Peak "Ecological" Water



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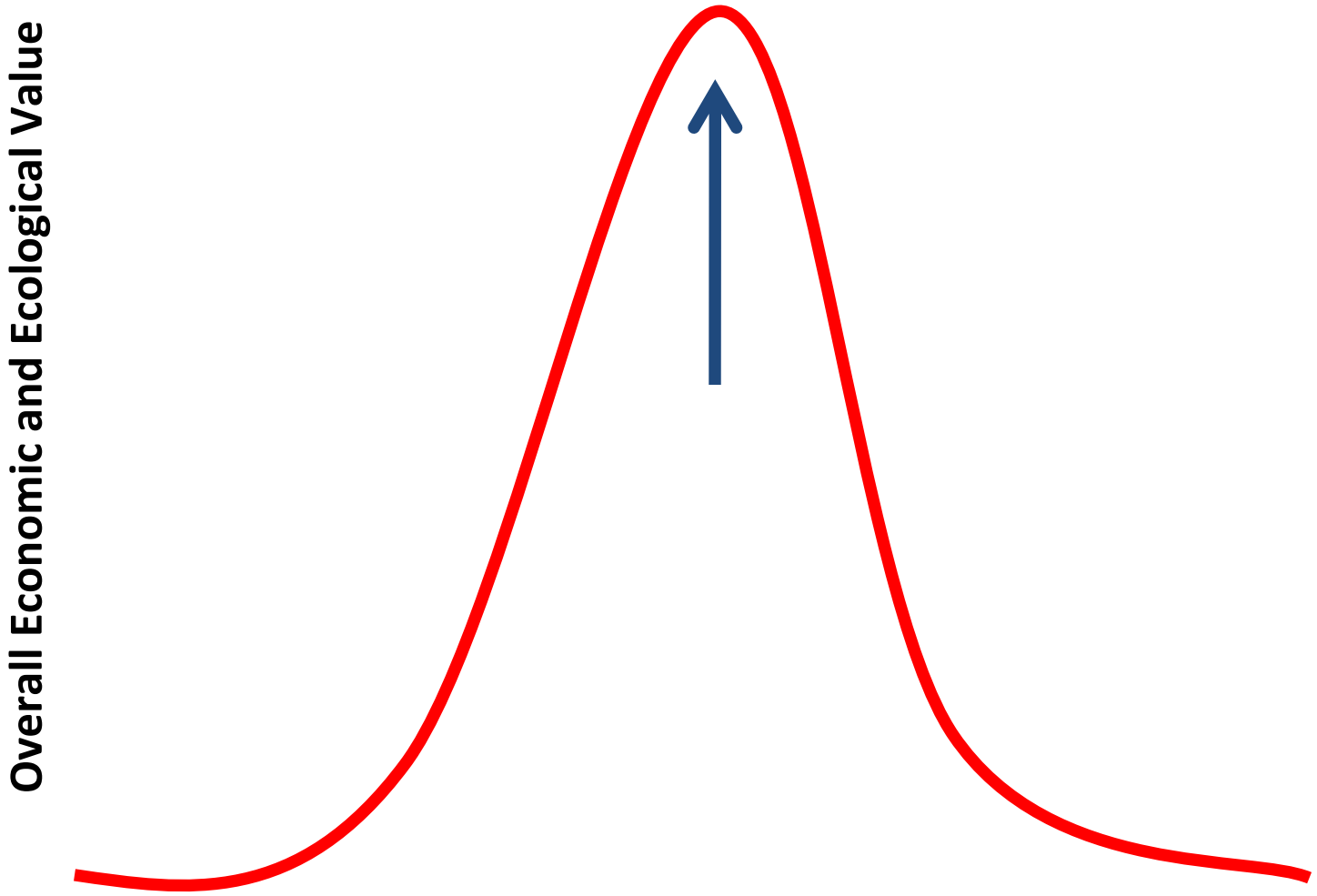
Peak "Ecological" Water



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So, What Does Peak Water Mean?

- We'll never "run out" of water overall. It is (mostly) renewable.
- Where water is "non-renewable" we will run into stock constraints.
- We will run up against "flow" limits that are a combination of natural and economic constraints.
- We are increasingly hitting (or exceeding) peak "ecological" water limits.

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What Does this Mean for the Economy, for the Water "Sector," and for Investors?

Two pieces:

Risks to companies that depend on water are real and growing; and

Solutions and opportunities exist in the water "sector" for companies, investors, and the public. But they can be hard to understand.

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Water-Related Risks for Industry

- Growing competition for water; worries about reliability
- New limits on access to markets/sites in water-short places
- Increased difficulty in getting/keeping water permits
- Higher pretreatment costs; new expenditures for treatment technology
- Regulatory uncertainty about standards and planning
- Higher costs for quality control, treatment, and pumping

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Water-Related Opportunities

- Revenue from water industry sectors totals over $400 billion.
- Significant growth—10-15% annually—will occur in some segments of the water industry.
- Significant growth will occur in some regions.
- Governments are encouraging new forms of investment and proposing boosting "infrastructure" funding.

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Water Sectors

- Drinking Water Treatment / Disinfection
- Industrial Pre-Treatment
- Industrial Wastewater Treatment
- Desalination
- Utility Water and Wastewater Operations
- Infrastructure Development and Management
- Demand Management and Conservation

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Some Final Thoughts

- People who understand water technology often don't understand economics.
- People who understand economics often don't understand the economics of water.
- Water rights laws are complicated.
- National laws often drive water quality investments and technology.
- Rates of return may be low, but reliable and steady.
- There are a lot of water weirdos out there.

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Conclusions

- There is a real water "crisis"
  - In different forms, in different regions.
- We will never "run out" of water, but
  - We are past the point of "peak ecological water" in many regions.
- Excessive use of water (or inadequate supply) is already constraining industrial production and growth in some regions and sectors.

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Conclusions

- Opportunities for clean-tech abound, but may require new thinking and new approaches.
- Truly sustainable water management and use – the "soft path for water" – requires efficiency, smart economics, advanced technology, and better governance and water management.

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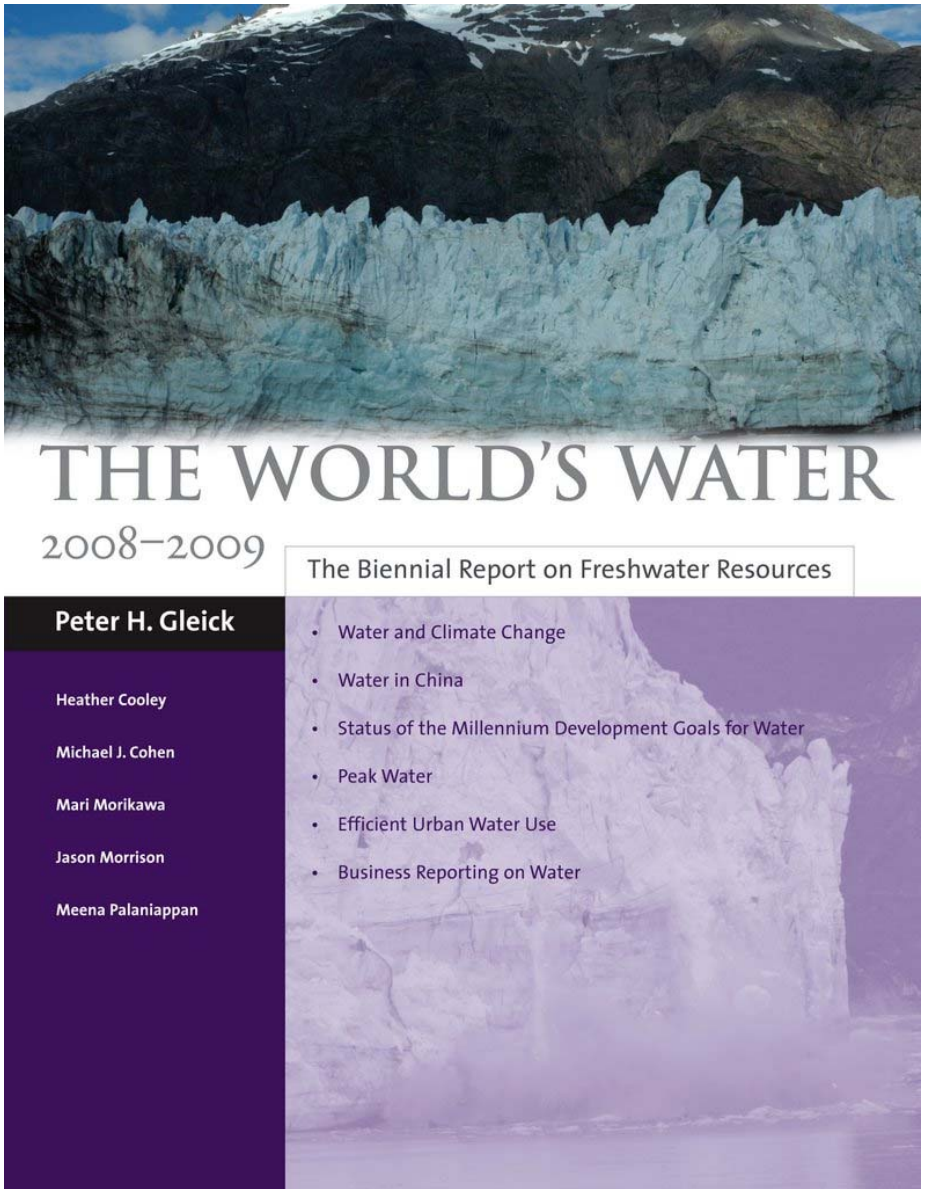

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