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Hi David,

First, I will briefly respond to your initial four question, then I will offer some broad comments on version one of TEOA and finally, I'll offer specific comments.

1. *Where it was useful for teaching?* All parts of the book were useful; however, I did not have sufficient time to devote to each part. We did have some good discussions based on pricing externalities and governance mechanisms. I would like to devote more time to the book than we did (roughly 2 weeks of a 10 week course.)
2. *Where it fell short?* Some of the supporting references and detail make some of the arguments less than compelling. More on this below.
3. *How it fit into your course materials?* Your book was one of many references we used. It was one of two textbooks; the other was Andrew Mertha's book *China's Water Warriors*. We also had a number of articles mostly related to China, but we started with "The Tragedy of the Commons" and a couple of responses from Elinor Ostrom.
4. *What students thought of it?* I think that they found it read easily and presented ideas that they had not encountered previously or at least, not in the context you present. Your book did provide some basics, those without economics, needed to be conversant on topics related to water scarcity.

My primary question for you is: who is your intended audience for the book? My sense is that it aims to inform a variety of decision-makers or those who will become such. You clearly have not framed the book for academics or, in my view, as a textbook for a specific course. If that were your intention, then you would have provided a more formal presentation (and I have several suggestions below.) For decision-makers, the reader's job needs to be made much easier. This can be done through charts, tables, and lists of key points.

Overall comments.

Main message: Economics deals with scarcity. Decision makers are influenced by both their disciplinary training and their decision-making context (institutions). Engineers are supply driven and subject to the technological imperative: "we can build it." It might be worth noting that "the pretense of knowledge is both costly and dangerous." See Hayek.

Links to references need to be much clearer. You have page references in the back. Include end note markings in the text and be sure to provide references for the tables unless these are examples you constructed for illustration. When in doubt, reference everything; of course, this is the academic in me speaking.

When you provide a list, bullet points would be better than straight text. It's both easier to read and to remember.

Supply depends positively on price, all else equal. It might be worth further discussion of cost structure and scale (and scope) economies and how these relate to price. This requires graphics and why marginal cost pricing cannot generate sufficient revenue to cover costs if sizeable scale economies exist.

A key theme is the importance of appropriate governance. You might discuss how Lin Ostrom responded to Hardin's "tragedy." See "Water Rights in the Commons" by Ostrom, Stern, and Dietz

I like the distinction between Parts I and II. These make good sense, but Part II needs to be "beefed up" a bit.

It might be worthwhile to devote a separate chapter to regulation in general and lay out "public interest" versus market for regulation along the lines spelled out by Stigler or Peltzman.

In terms of governance, it might be useful to discuss both the Colorado and Great Lakes Compacts. These are rich cases that illustrate many of the problems you discuss in part II.

It might be useful to discuss the allocation mechanisms existent under Oregon's Freshwater Trust (<http://www.thefreshwatertrust.org/>) or the Columbia River Basin Trading regime (see your August 3rd blogposting.)

Consider highlighting a set of axioms or principles that you return to throughout the book. O'Sullivan does this with his Urban Econ text. Examples might include (all drawn from your text at different points):

1. Pricing can internalize externalities
2. Clear property rights can yield efficient levels of water generation.
3. Efficiency can best served by having marginal uses priced at their full social cost. OR Scarcity pricing is critical to efficiently address the end of abundance. OR We should pay the full cost of our fun. OR Sell scarce water to those who value it most highly.
4. Equity can be best served by transfers that do not affect behavior at the margin. OR Rights allocation serves equity goals.
5. Monopolists serve their own interests unless appropriate governance and incentives shape their behavior.
6. Competition forces suppliers to deliver value for money. OR Markets provide the necessary flexibility to match scarcity and preferences.
7. Water management should take place at the watershed basin level.
8. As the separation between customers and decision-makers increases, transparency and efficiency decline.
9. People spend other people's money more wastefully than they spend their own.

Specifics

- Page 18 –term "once the shortage is avoided" is vague.
- Good discussion of characteristics of goods – page 20. Maybe more examples here.
- Second sentence of header of Chapter 1 is confusing. It's not clear why residential water prices per capita is either fair or efficient.
- Page 33 – include somewhere a discussion of the economics of desalination (including how the cost has come down.) Gavin Menzies in *1421* argues that the Chinese successfully desalinated water for their many passengers on their ocean going vessels.

- Explain why there exist cost differences between SF and LV
- Death spiral problem discussion is very important (pages 40 and 41) Document some of the detail such as the rule of thumb that costs are largely fixed (80%), but revenue is variable.
- Jan Beecher’s piece on water budgeting might be helpful here and for reviewing attempts to make judgments. (<http://dx.doi.org/10.5942/jawwa.2012.104.0021>)
- You might explicitly address peak load pricing.
- Discussion at the beginning of chapter 2 could use more formality. Cap and trade in the US needs a good example. Perhaps, the allocations for depositing of waste along the Fox River (which runs north from Oshkosh to Green Bay) would be useful.
- I like the discussion of Coase’s theorem. In short, it separates the efficiency question (what level of externalities is best?) from the equity question (who pays?) Graphics would help here to show the difference between private and social costs.
- You cite privatization’s role in Argentina. Chile probably is better. Spell out the pertinent details. Page 63.
- Good discussion of the importance of property rights to generate innovation – Chapter 4
- Stockton, CA example P88 – can be added to (bankruptcy in 2012)
- Page 89 – “Cost of building a network is a sunk cost” - This only holds if the network owner cannot recover such costs in any way; that is, no transfer or sale is possible.
- Page 99 – excellent initial paragraph
- Discussion of diversions should address Great Lakes Compact. Gets into the area of origins law – 109 Check out Peter Annin’s book, *The Great Lakes Water Wars*.
- Example on page 111 needs more clarity. Put numbers into a table. Be careful with statements such as “opportunity costs go to zero when PVID sells water, because water is going to a higher valued use.” As long as PVID sells the water for positive price and gives up its alternative use, there is a positive opportunity cost. You might argue that social net benefits are maximized or that welfare loss is minimized.
- The discussion of the Balinese water temple approach is interesting but incomplete. The authorities are substituting their judgment for a decentralized market judgment. This seems counter to what you argue for most of the book. Are you arguing that “rituals” are better than markets? Page 113
- Distinctions between water and oil markets are important. You might want a bit more discussion of renewables vs. non-renewables.
- I like the distinction you make between when purchasers buy both the product and what’s needed for its ongoing use. This again returns to scarcity pricing as critical. (131)

Part II

You might note that government does not equal governance (emphasized in chapter 7)

- I like the point that all policy choices impose costs on someone and the highlighting of public interest vs. public choice frameworks.
- Key point on 148 regarding gap between customer and decision-maker reduces transparency and efficiency. (picks up notion introduced on page 131)
- “Engineers are more cost conscious than value conscious.” – 147. I’m not sure I buy this. Engineers also suffer from the technological imperative; so they seek supply –based solutions rather than manage demand. Economists, if they are doing their job correctly,

address both and seek to minimize welfare losses (which admittedly are not easy to determine.)

- If you seek more about the tragedy of the anti-commons, see Michael Heller's work *The Gridlock Economy*.
- Preventative is a noun. You should refer to preventive maintenance – 153
- There is a growing literature on prediction markets as more accurate than experts since real money is at stake and the distribution of opinion is likely to be unbiased (if the market is sufficiently liquid.)
- Loved chapter 8 – especially the Other People's Money notion. I call it the OPM (or opium) principle.
- 159 – add graphics regarding scale economies, minimum efficient scale and pricing. Figure 7 features a flat MC curve. Your arguments hold to some degree if MC declines with quantity. The key is what does the “full cost” curve look like.
- I would like to know more about the 2017 Hoover allocation.
- The 1922 Colorado River Compact is fraught with problems. You might note this in your discussion on 165/166.
- I really like the iron triangle of specific interests argument -167
- Your discussion of the 3 Gorges Dam project needs more detail or drop it. I've heard as well as seen evidence of serious compensation for those forced to move. Of course, adequacy and opportunity cost analysis needs to be done here. 171
- I like your use of TI's definition of corruption.
- Chapter 8 would benefit from a discussion of the Colorado and Great Lakes compacts
- Chapter 9 does a nice job highlighting the differences between managing oil vs. water as well as the need to match institutions (such as property rights) to the desired objectives.
- Incentives matter! Indeed – 181
- Desalination plant in California discussion is a bit confusing. Perhaps a table would help.
- Local water management – cite Oregon FWT or Columbia basin plan – 183
- Although I find your example on 185 interesting, it's not clear to me why one might not just auction water rights and then have a water trust (or the Nature Conservancy) be one bidder in the process.
- Money drives this opportunity cost option. Drop the “is”.
- Key point in chapter 10. Flexible systems are needed to adapt to change. Hard coded law or compacts make this difficult. Markets are made to adapt.
- Good introduction of risk versus uncertainty and how it affects behavior.
- Chapter 11 – I like the idea of turning human rights into property rights. Rather than negative and positive rights, I prefer tangible and intangible rights. (199/200)
- Discussion of ownership vs. use rights is worthwhile. 204- 206
- Page 210 – comment on the Colorado River allocation based on flows available when the 1922 compact was written.
- Chapter 12 is way too short. You make a number of good points but explicit examples would highlight the key arguments. Water treaties/behaviors along the Indus River and the Jordan River would be interest here.