Seminar

3

Valuation of Ecosystem Services

Speaker

Dr. James Boyd

2011 ECOSYSTEM SERVICES SEMINAR SERIES

GORDON AND BETTY MOORE FOUNDATION

Ecosystem Services Seminar 3: Valuation of Ecosystem Services

Presentation and Discussion Notes From Speaker: Dr. James Boyd

Seminar Series and Seminar 3 Goals:

The goal of the multi-session seminar is to educate the broader conservation community including practitioners and funders on the diverse aspects of ecosystem services – such as how to account for ecosystem services and to effectively measure, manage, and communicate them.

Seminar 3 and associated readings focused on the following goals:

- *Monetary and non-monetary valuation*
- *Methodologies for valuing ecosystem services: biophysical, economic, social*
- *Strengths and weaknesses of current methodologies*
- *Contrasting perspectives on "putting a price" on nature*
- *Tradeoff Analysis – how to make informed ecosystem services decisions regarding tradeoffs inherent in decision-making*

This document is a product of the Gordon and Betty Moore Foundation's Ecosystem Services Seminar Series that took place between March and November 2011. For more information please visit www.moore.org or request "ES Course Info" from Heather Wright at info@moore.org.

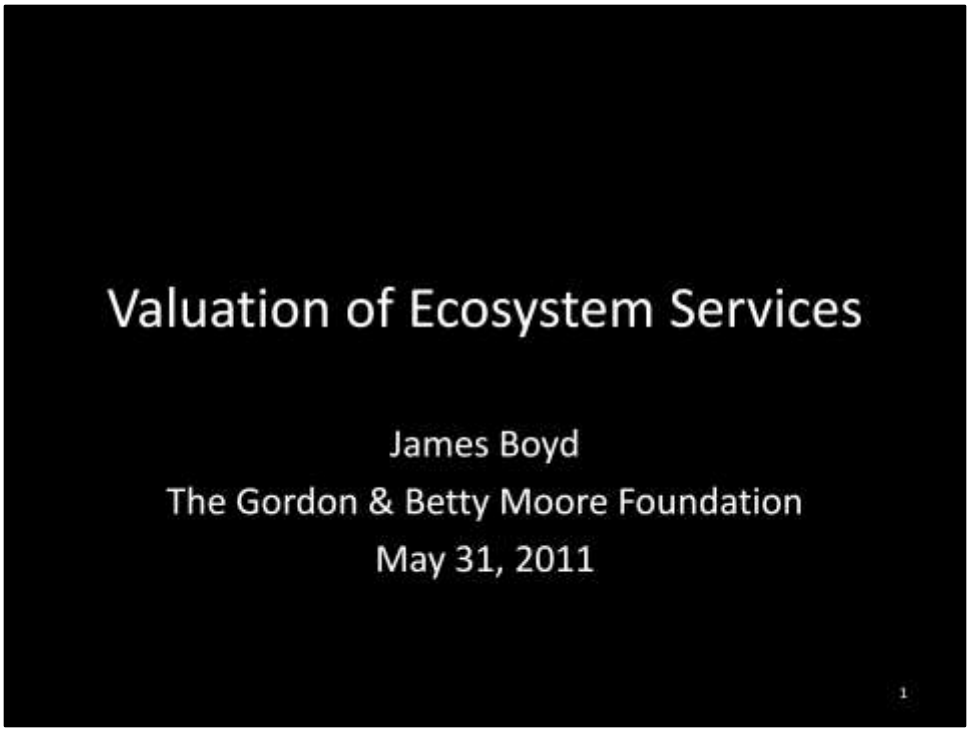
Disclaimer:

This document is a summary that includes PowerPoint slides from the speaker, Dr. James Boyd, and notes of his talking points. In addition, we provide a synthesis of important questions discussed during Seminar 3. Please keep in the mind that the following document is only a recap of Dr. Boyd's presentation and Blue Earth Consultants' notetakers have, to the best of their ability, captured the speaker's presentation. We hope that the following presentation and discussion notes will be used as resource to advance further discussions about ecosystem services.

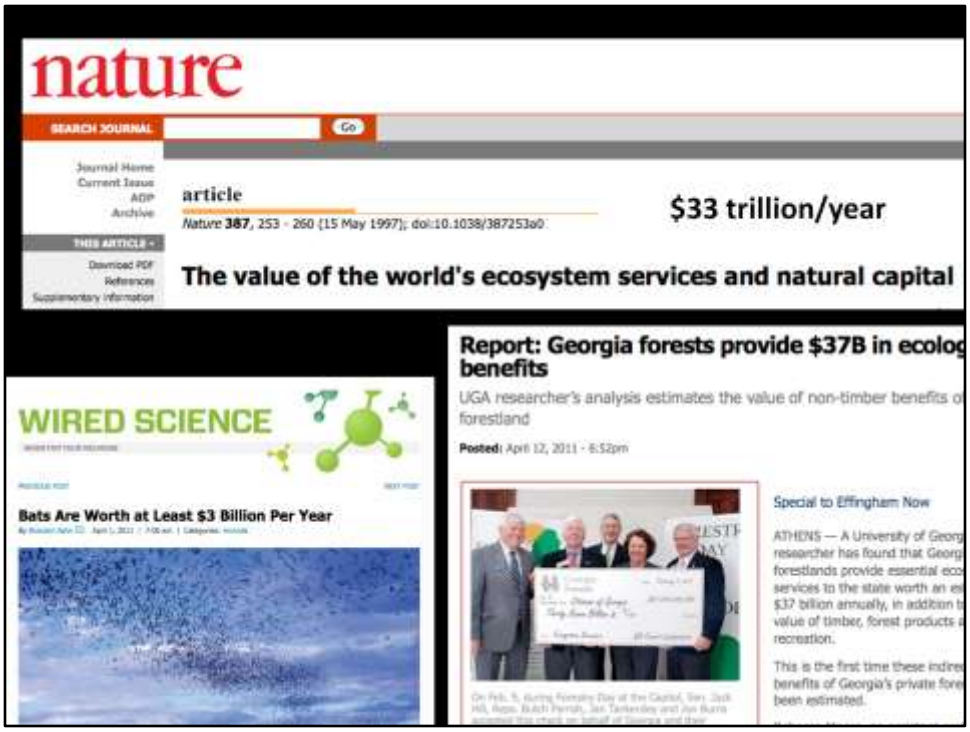
GORDON AND BETTY MOORE FOUNDATION

COASTAL QUEST

BLUE EARTH CONSULTANTS



- This topic has a lot of room for philosophical discussion and the hope is that this presentation stimulates such discussion with an end focus on opportunities of ecosystem service valuation.



- I have been an economist for a few decades and the idea of thinking about nature and its value has become more common within the past five years.
- As a group, let us reflect on what is going on here.
  - Take the headline depicted on the slide that estimates the value of bats at $3 billion/year:
    - Do we believe that?
    - How will we use this kind of information?
  - I want to convey that valuation is happening and we need to figure out how to use it.

Tallying BP spill toll on wildlife, habitat

'Putting a price on a brown pelican is like trying to put a price on a sunset'

Fight for survival: An oiled crab crawls on the hand of P.J. Hahn, Plaquemines Parish coastal zone director

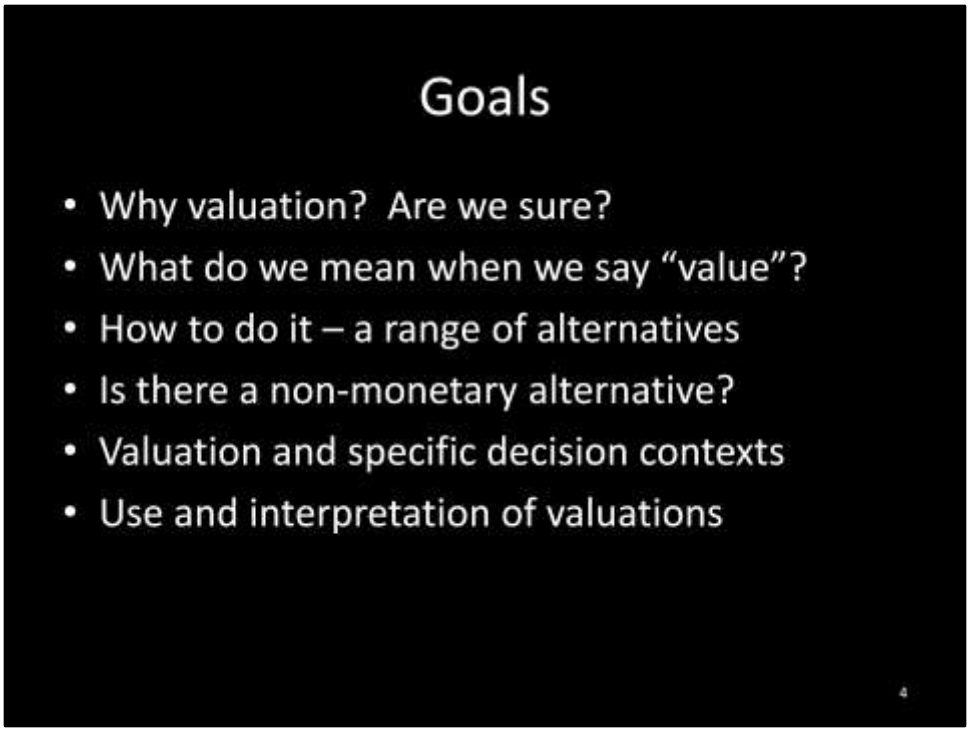
By Donna Leinwand
USA TODAY

What's a brown pelican worth?

"$328.63," deadpan economist Jim Boyd, senior fellow at Resources for the Future, a non-partisan economic research organization. "Reasonable people will differ on the value of a pelican. Some will say zero; some will say thousands."

It's a question that could consume environmental economists and scientists for years as they try to put price tags on the animals killed and habitat destroyed by the massive Gulf of Mexico oil spill — an environmental analysis federal officials describe as the largest of its kind. The federal and state authorities ultimately will send their bill to BP and the other compa-

- This article appeared in USA Today just after the oil spill in the Gulf of Mexico. A reporter called me to ask about the value of the brown pelican. I jokingly said $328.63 and proceeded to have an in-depth conversation with the reporter for another hour about valuation. The report only included the silly value I gave.
- The point of this story is to demonstrate the power of the number. It is what the media wants because that is what people understand, but they do not necessarily make sense. When you see them reported in headlines or in the media, be skeptical.



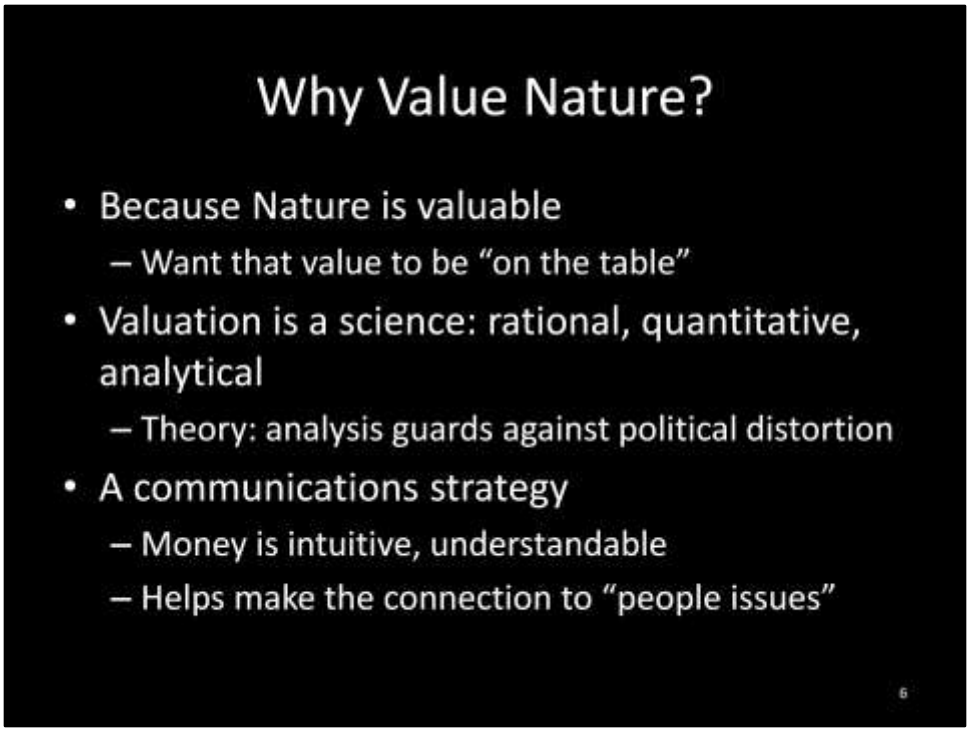
Presentation Goals

- I would like to be a little philosophical in today's presentation and think on how valuation is going to work in the long-run.
- This presentation will not be too technical, but I will briefly touch on technical aspects.
- Non-monetary alternatives are important. Non-monetary values can help to make the connection without resorting to the single dollar value at the end.
- We will also talk about opportunities to impact policy and public dialogues.

- Does anyone want to talk about why you think we need these values?

Group Responses:

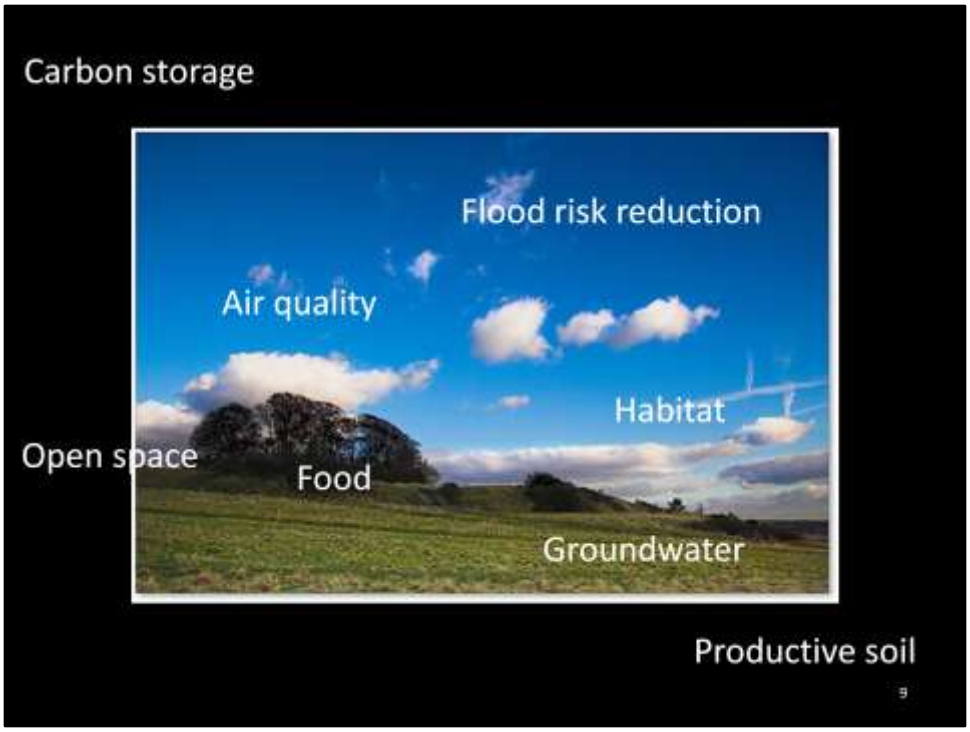
- The narrative process following the Deep Water Horizon, i.e. there are legal reasons to get values for awarding damages etc.
- Economists understand it and they are powerful folks who help frame policy.
- People understand dollars.
- Practical way to understand the damage going on in the Gulf.



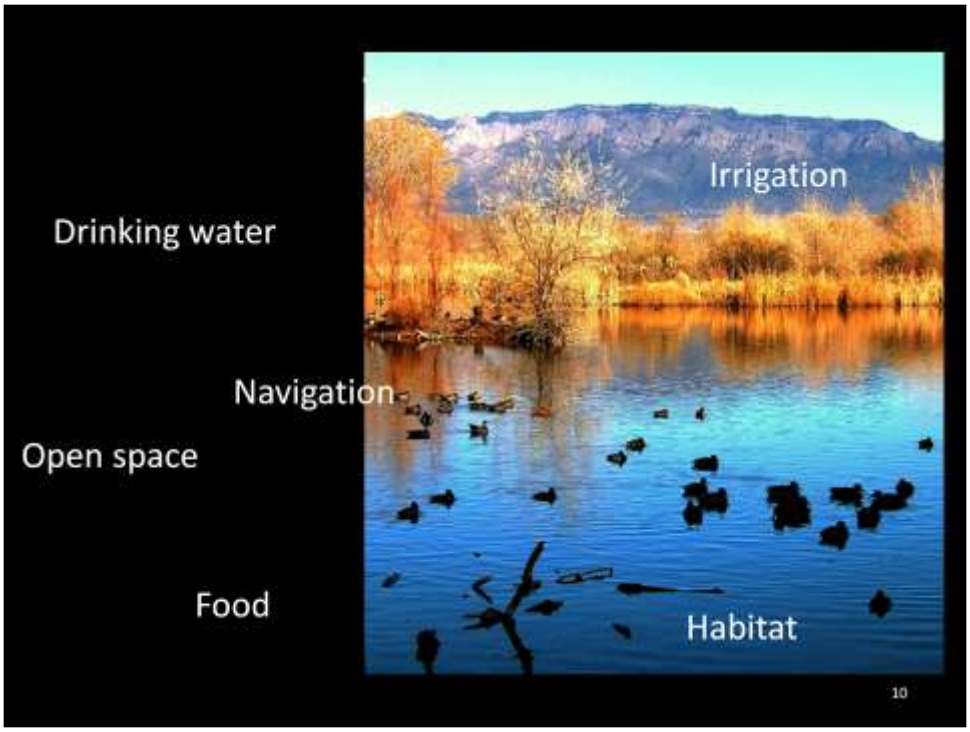
- To an economist, the fact that nature has value has been uncontroversial for a hundred years. Economists agree that the value of nature should be on the table and considered against other easy to measure aspects.
- The second point is from the reading and may be an older school argument for doing valuation: it is the rational science valuation of what is important to our society. The idea here is that valuation disciplines our politicians. I would say this is a naïve theory.
- The act of valuing nature also helps people make the connection.

- We are talking about valuable stuff.
- We believe that there is "stuff" like the objects pictured in the slide and most people understand and agree on the value of the "stuff," but … *[Boyd's point continues on slide 9]*

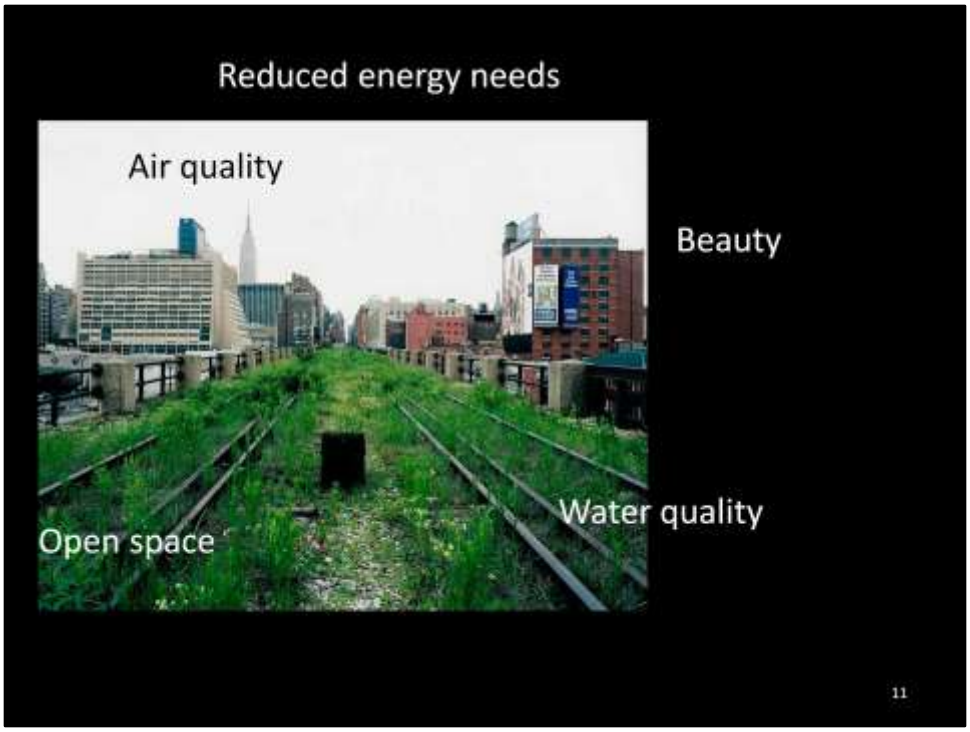

Ecological Wealth
• All around us
• Shared, common goods
• The foundation of all economic activity & human wellbeing



- *[Boyd's point continued from slide 7]*…. there are all these other things that are valuable that are harder to see, i.e. air quality, productive soil etc.



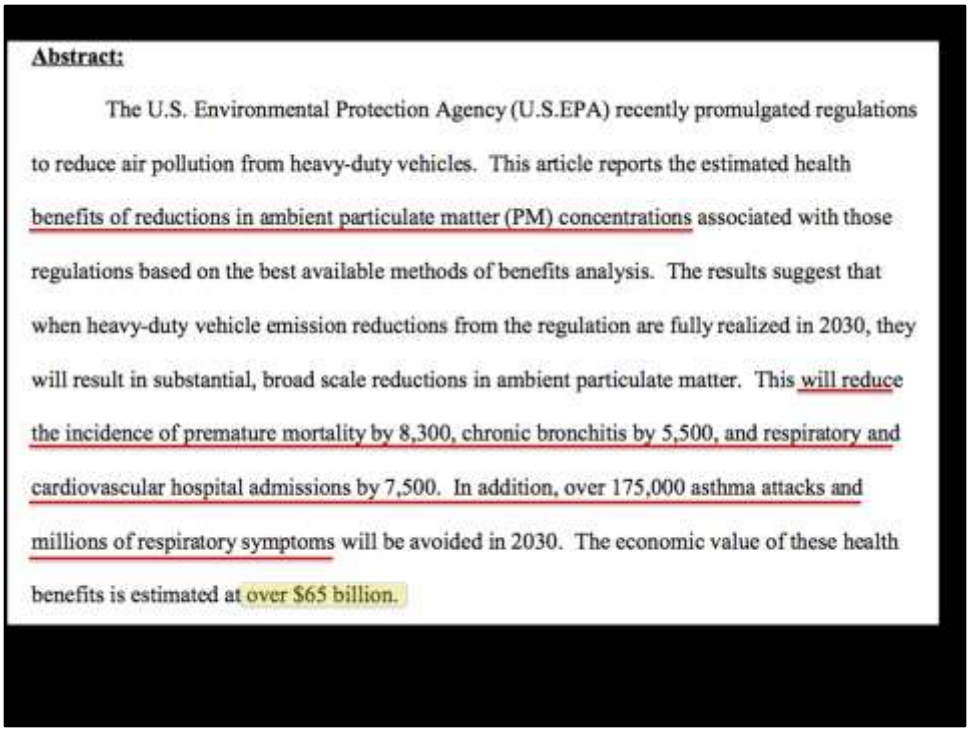
- They are public, non-market resources and what we are trying to do with valuation is to give life to those harder to see resources like air quality, open space etc.
- This image shows a different landscape from the previous slide, but tremendous value still exists no matter what the mix of elements.



- We are not just talking about wild nature either; New York City, Shanghai etc. also have these kinds of resource values.
- These values exists everywhere, they are just harder to see.

Back to the importance of valuation:

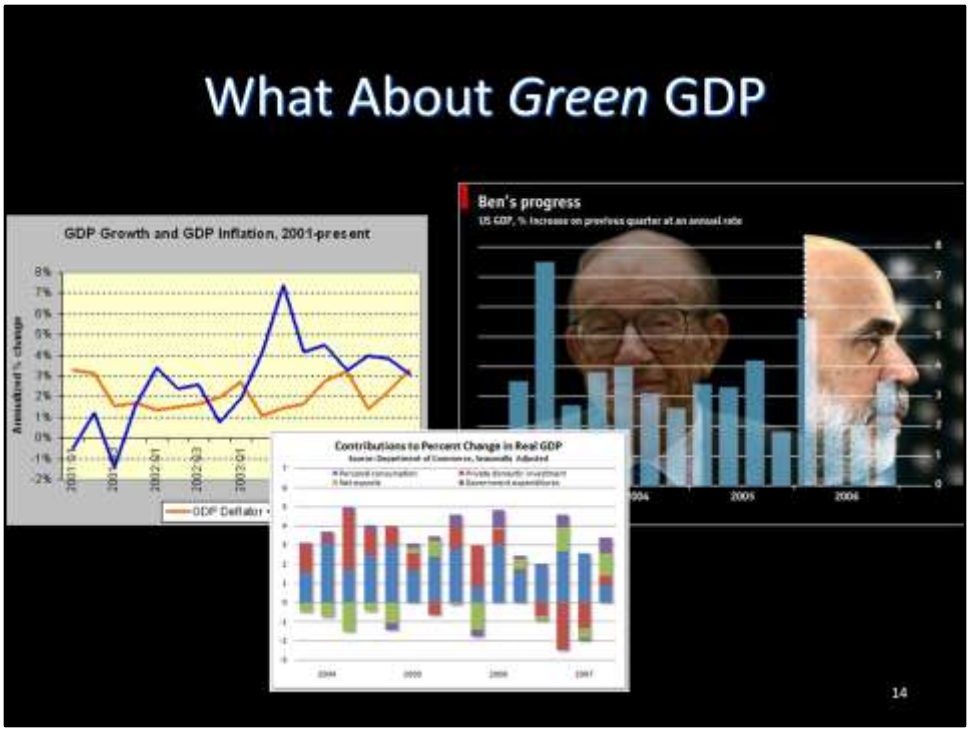
- It is important in any policy battle.
- For example, Wal-Mart will make a strong argument about the benefits a new store will bring to the community (revenue, jobs etc.). Essentially, we need a counter argument for a natural landscape. If we can boil it down to dollars, we can have an argument on the same level as Wal-Mart.
- This is another reason why we do valuation.



Abstract:

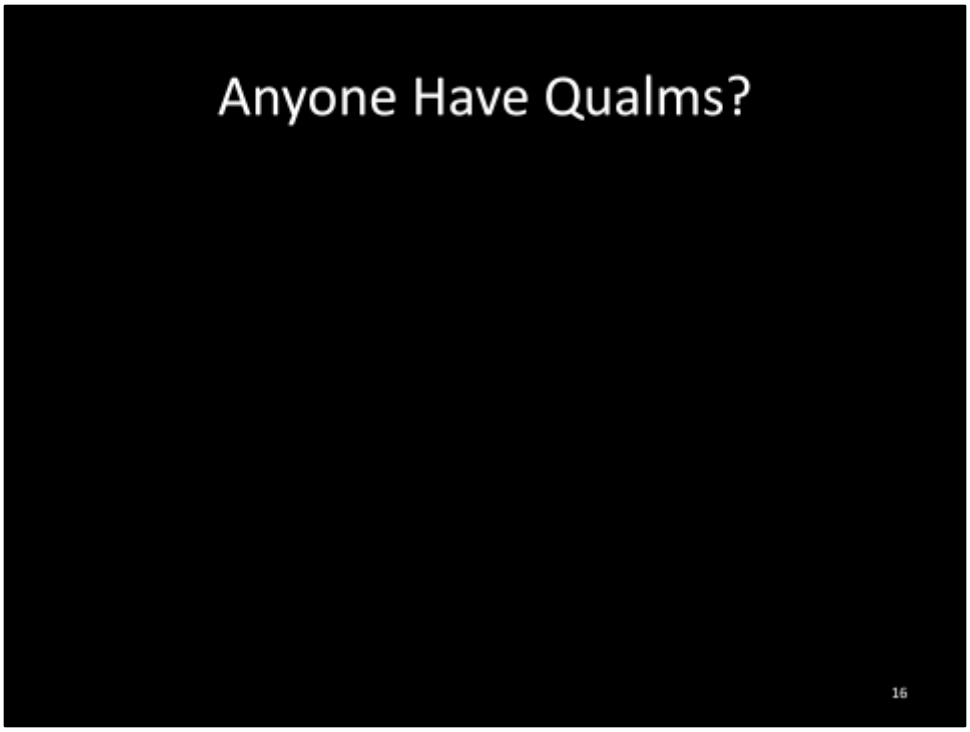
The U.S. Environmental Protection Agency (U.S.EPA) recently promulgated regulations to reduce air pollution from heavy-duty vehicles. This article reports the estimated health benefits of reductions in ambient particulate matter (PM) concentrations associated with those regulations based on the best available methods of benefits analysis. The results suggest that when heavy-duty vehicle emission reductions from the regulation are fully realized in 2030, they will result in substantial, broad scale reductions in ambient particulate matter. This will reduce the incidence of premature mortality by 8,300, chronic bronchitis by 5,500, and respiratory and cardiovascular hospital admissions by 7,500. In addition, over 175,000 asthma attacks and millions of respiratory symptoms will be avoided in 2030. The economic value of these health benefits is estimated at over $65 billion.

- This abstract is from a study done by the Environmental Protection Agency (EPA) and National Institute of Health (NIH). The EPA was thinking about tightening auto emissions regulations and did a multi-year study to calculate the potential impacts.
- The study showed that fewer people would die earlier and fewer people would get sick if the regulations in questions were in effect. The study estimated the benefits to be over $65 million. Obviously, this number is a powerful motivator and thus helps to push this kind or regulation forward.
- Now, imagine being able to do this for ecological systems and being able to show what can happen to real people and real economies and then put a dollar value on it.



- This is another trend we are seeing not just in the technical communities but also in the larger community: there is a growing sense that the way we measure our society is wrong. GDP does not cut it.
    - The more oil we burn, the higher GDP grows. The more fish we pull out, the higher GDP grows. GDP does not convey what is really going on.
- Valuation will produce more practical values. It will balance out our over consumptive behaviors to preserve future well-being. This idea of *green* GDP is another application with real legs in the international community.

- I am doing some work with The Nature Conservancy (TNC) and they are asking the following question:
  - We do not have lots of money to spend, where should we spend it to get the greatest impact?
- Typically, these investments have been oriented toward increasing biodiversity.
- Valuation is a way to capture progress and effectiveness of multi-faceted outcomes.
- Valuation can help direct investment.



- Does anyone have any problems with these ideas?

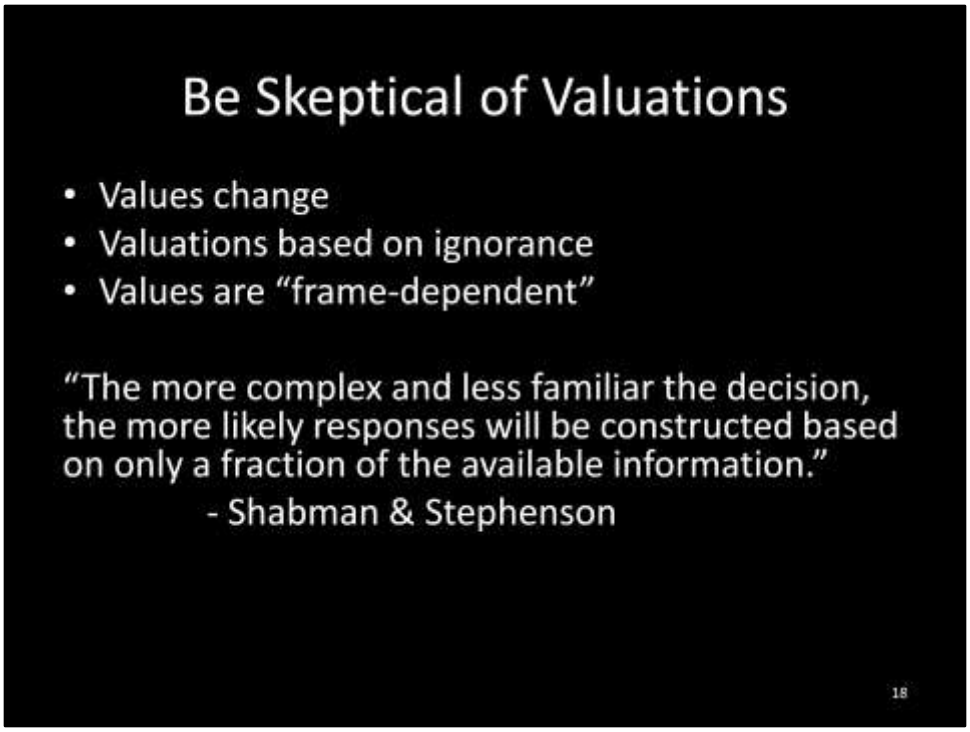
Group Responses:

- In the example where the EPA valued air pollutant regulation at $65 billion, clearly they were valuing lives. When you get to the point of valuing lives and using different risk assessment and different discount rates I get uncomfortable.
- Value to whom? Who gets to make the decision? There are issues with equity and equality that make me uncomfortable.
- The illustrations you have shown are about viewing nature as a bundle of services, but there is something important about fitting them together that is valuable in itself.
- Maybe it is the opposite, i.e. by not considering nature and dollars, we have undervalued nature.

Boyd's Reply:

- There is a tendency to deconstruct a system in order to get a handle on it. There is a desire to define each specific good and service. This is a struggle because psychologically we are drawn to the totalitarian way of thinking about nature. I will not defend the desire to deconstruct systems but I will recognize that it poses huge problems for economics.
- This goes beyond the value of nature as well. If you think about cars, they are bundles of goods too. One thing I am starting to do is work with marketing people to see how they measure and design products and how they reach people. In addition, I think this is a great future research question and one our society has not grappled with enough. I hope that we can come back to this issue.

- There is a big difference between value and *values*.
- When we invade a country, we do not actually do a cost-benefit analysis. We do not put a price on freedom.
- For some of us, valuation can feel a little strange. We will do it for a variety of reasons, but we should not forget that valuation may reflect a set of *values* and our donor communities and stakeholders may feel accordingly. This process continues to cause people problems and we should be sensitive to that.
- Last point is depressing: Does anyone actually care?



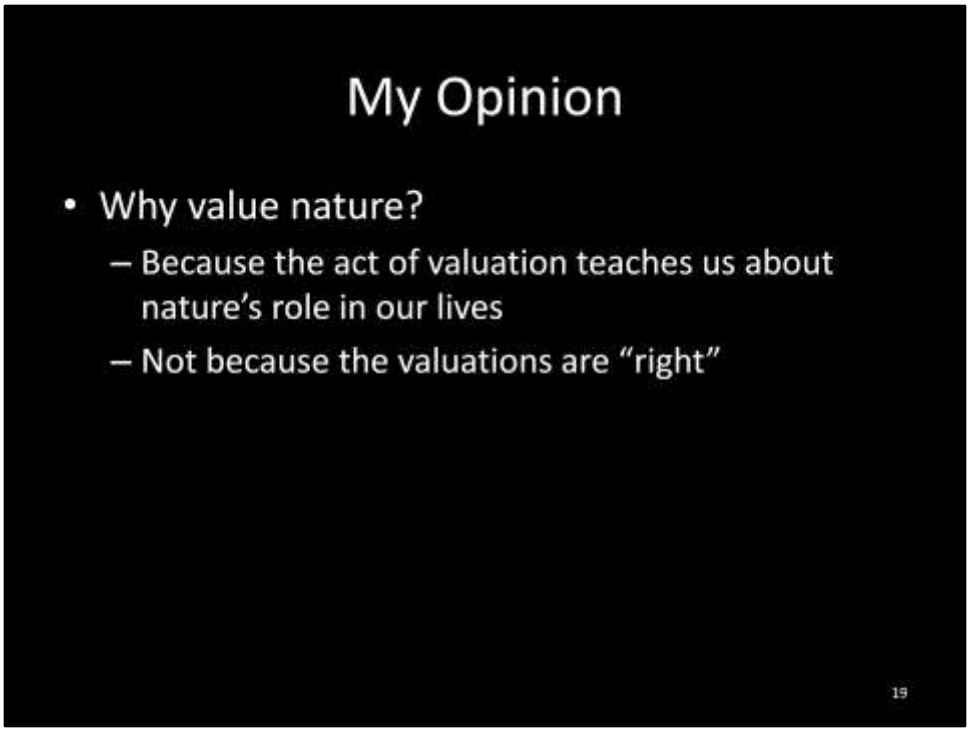
- As we talk about skepticism, I want to leave you with **positive skepticism** today.
- The three points listed on the slide are probably obvious, but they are important to remember. They are particularly important when quoting a study from 1985. Values change with time and we need to recognize that. Values can be influenced through social marketing and are always changing.
- Valuation is based on ignorance – this is another reason to be skeptical. When you actually try to tease out the valuation reasoning, it is a slippery process.

Group Comments:

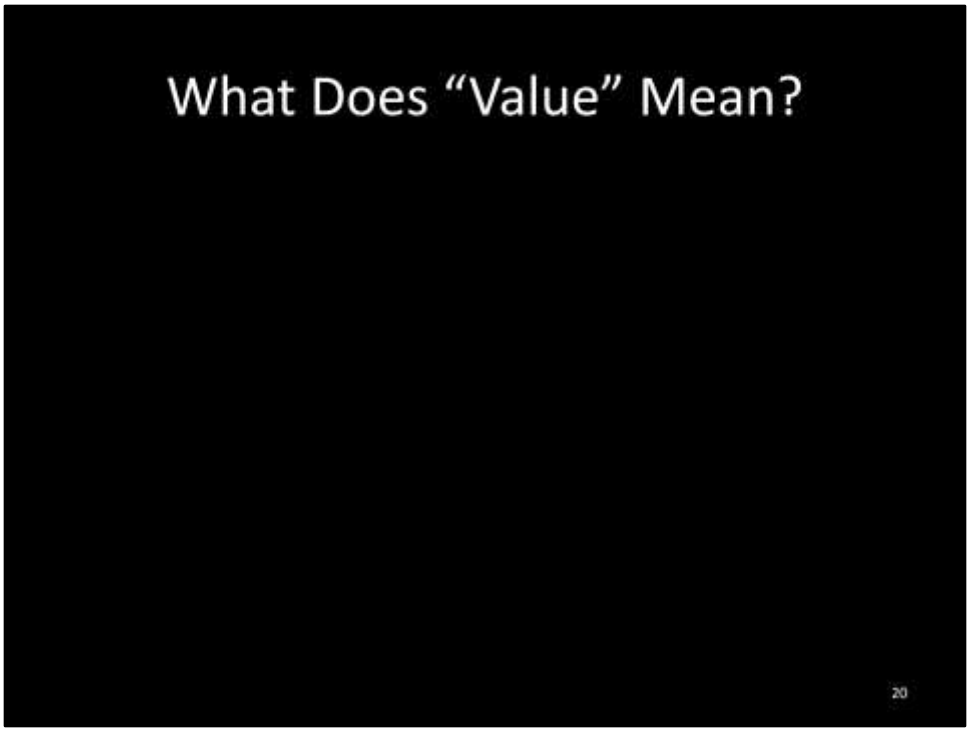
- I have a business background, and business people are trained to make decisions despite the existence of unknowns and high uncertainty. You are taught to make a decision, move forward and then you learn based on what happens. It has always been puzzling to me that people have an objection to this because the alternative is to do nothing and then have a value of 0. It is better to try than do nothing; the business community can do this very adeptly.

Boyd's Reply:

- Thank you for bringing that up. A lot of the work comes from a very scientific and technical community and we tend to overcomplicate and overanalyze. We are worried about not being published and about what our colleagues will think. Many of our stakeholders are not ready, but we have to get to the point where we make decisions because it will never be perfect in the end since values change continuously.



- When you do valuation, you learn a lot about nature and human well-being.
- I look at any number with skepticism because I know how the sausage is made.
- We need to work together to better tell the story.



- Now I would like to talk about a few misconceptions.

- Valuation is not about business or making profits, it is about more than that.
- Valuation does not always have to be expressed in the final $ amount. Dollars are merely a yardstick.
- Government is not acting on valuations; valuations are not THE decisive factor. Valuations are one element that goes into the calculus.

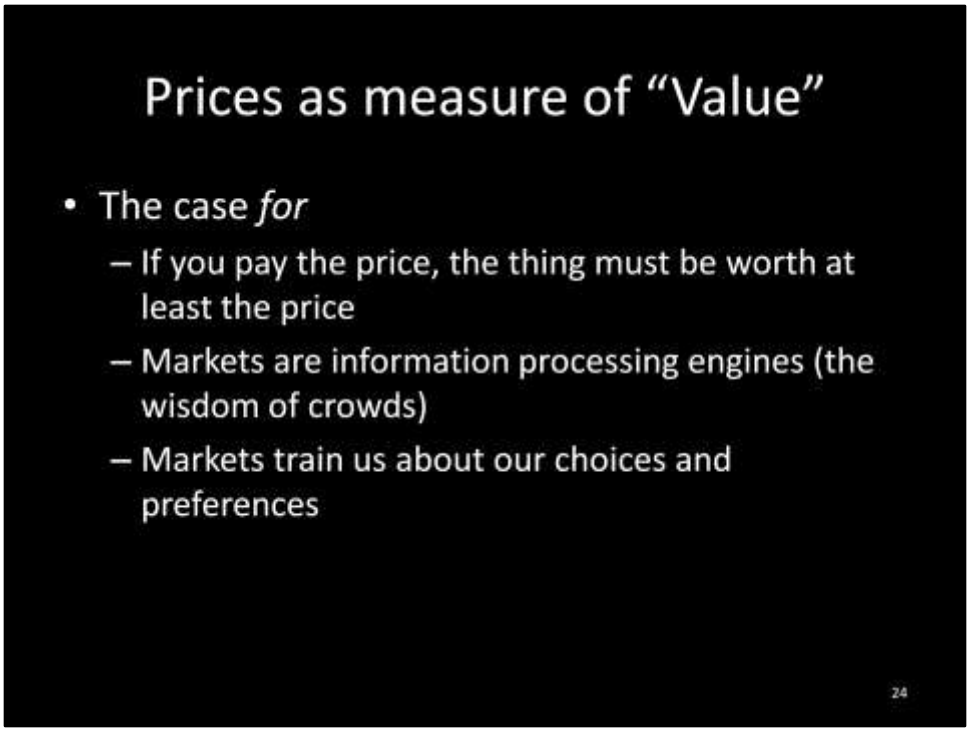
- Does this value bother anyone?

- My hypothesis is that it is not controversial.

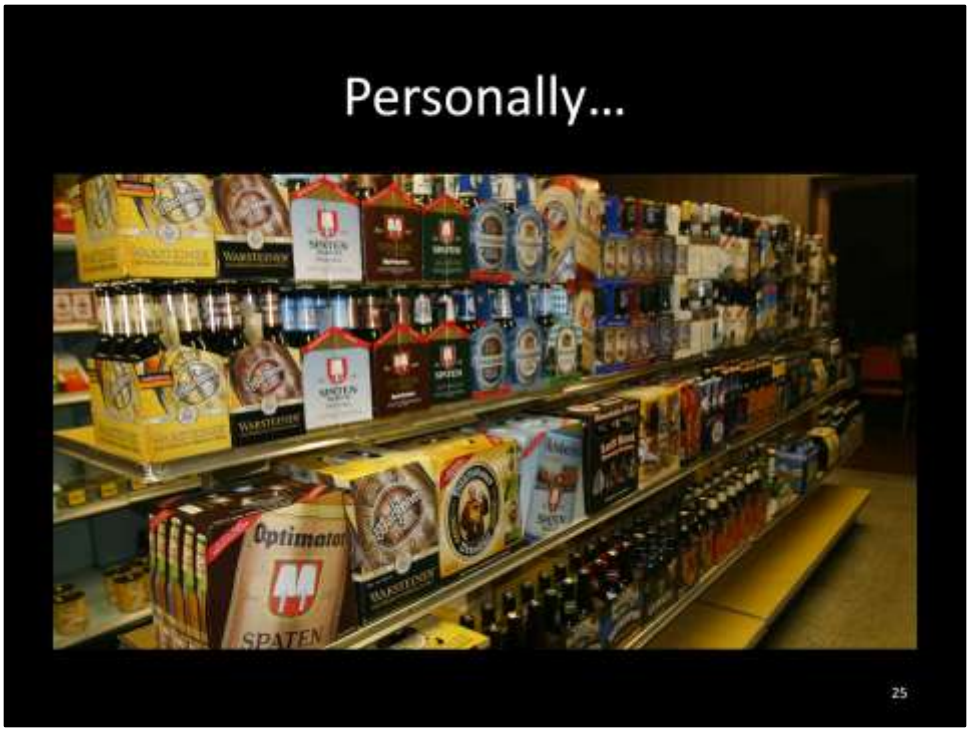
- Now if I say the wetland is worth $28,000 does your emotional or intellectual comfort change?

Group Responses:

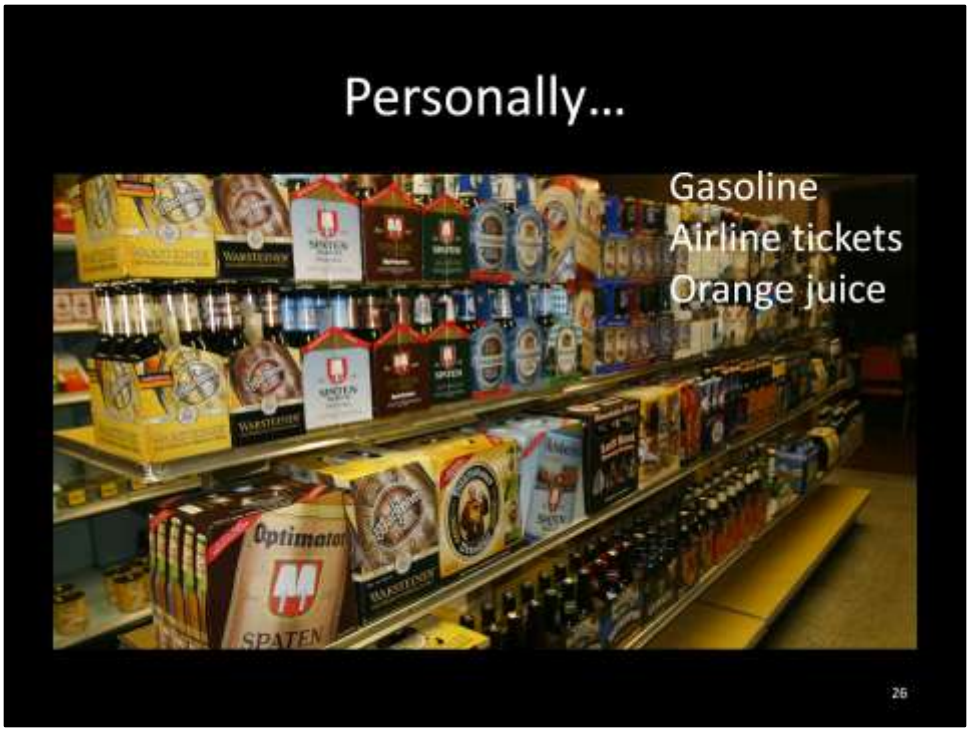
- From my experience with wetlands, the value seems low.
- I observe the Prius in other markets for about $28,000 so it makes sense to me. On the other hand, I cannot go out and see similar prices and valuations for a wetland, so I do not feel comfortable with the price.



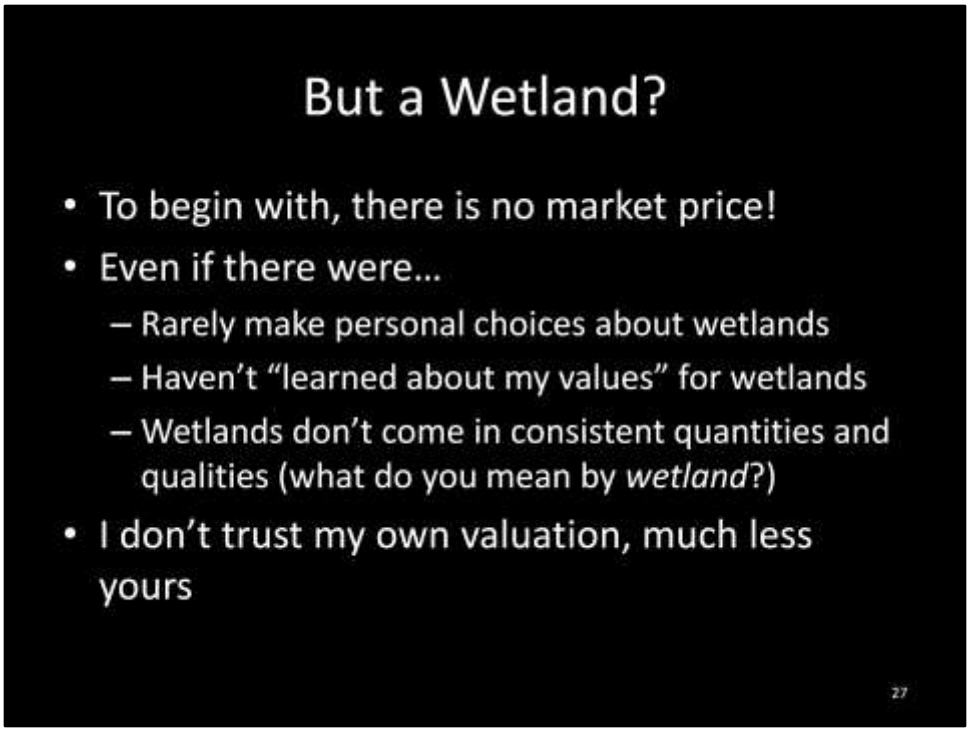
- In a market situation, you are forced to confront choices and options and the value of those differences. This is why prices are a good measure.



- I interact with markets regularly and frequently when I buy beer.
- I know quite a bit about what I value for certain kinds of beer because I have compared prices and I do it regularly. Through my regular market interactions, I have been training myself to think cognitively.



- The same is true for gas prices. As a society we are regularly confronted with gas prices; they are posted everywhere and it drives politics. There is some experiential valuation components to it.
- Most services, we value more episodically, which makes the prices more difficult to demonstrate.

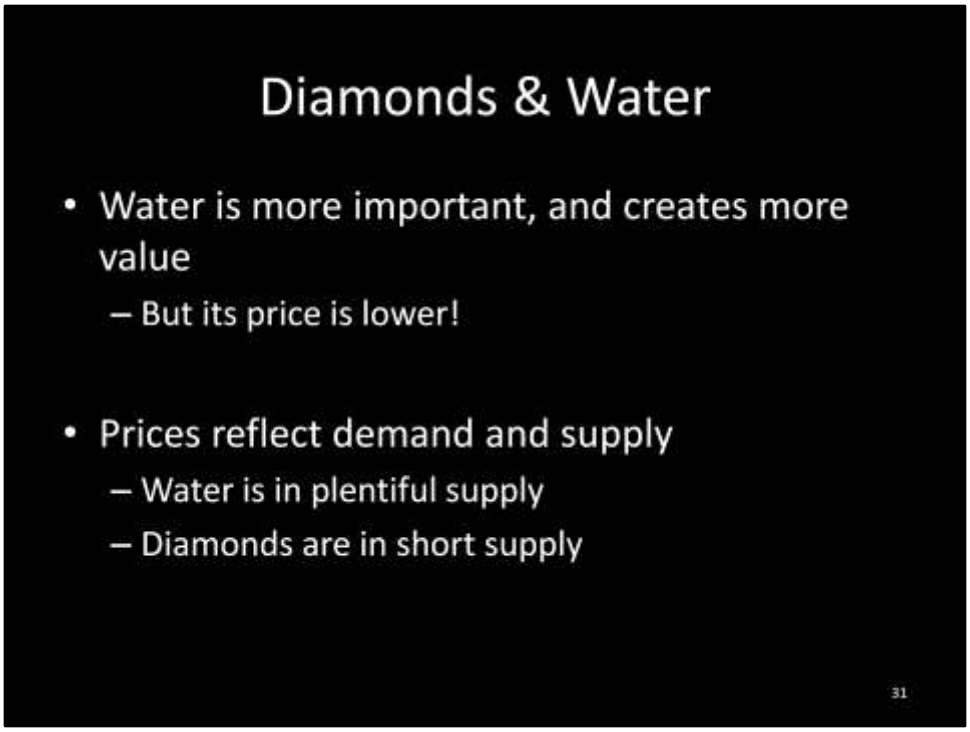


- There is no market price for a wetland right now.
- There are some costs to wetland restoration but in general, we are inexperienced about how we value wetlands.
- We rarely make personal choices about wetlands.

- Another important issue is how direct experience influences the value.
  - If I live there and/or I walk there, I will value the wetland more than if I had little interaction with it.
  - One's direct experience is a big part of value but so are the contributions the wetland has to larger components like flood mitigation, habitat creation in an estuary 10s or 100s of miles away.
  - The wetland's roles in production that are harder to see create big problems for valuation and we need to be conscious of them.

- Prices are a lower bound on something.
- For example, I have an iPhone application to play guitar and it only costs $20. To me that application is worth much more than just $20. It is worth the total cost of buying the guitar, the amp, and the various distortion pedals. The application is worth hundreds to me and I bought it because it costs less than what it is worth to me.


Startling Statement 1: Heal
"The market price of a good does not tell us how important that good is to society."
30



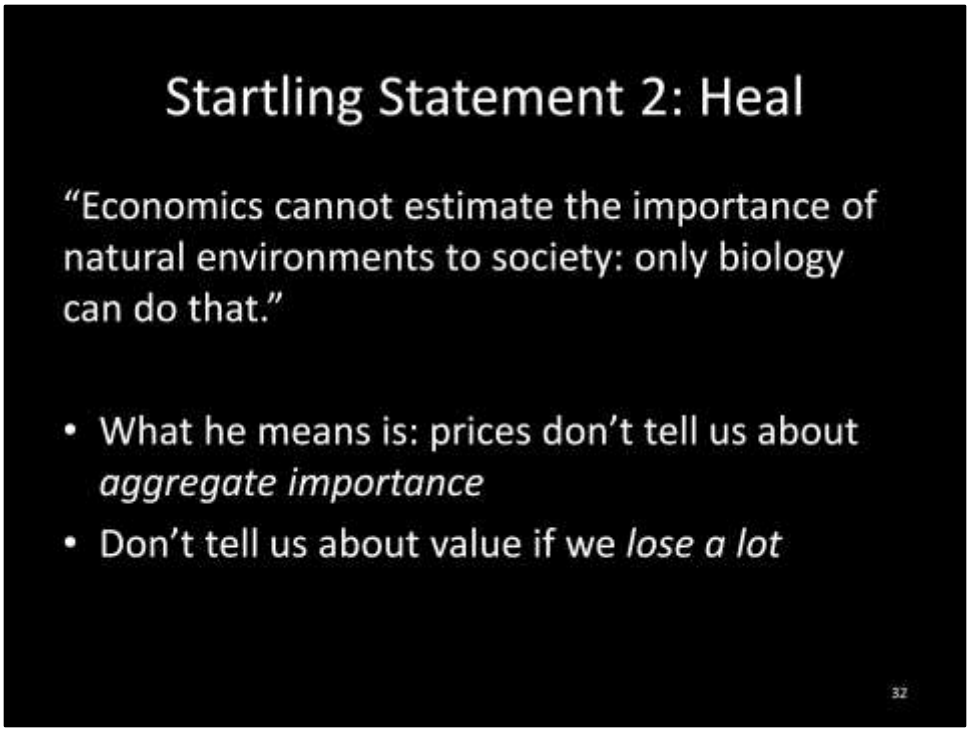
- This demonstrates the diamond and water paradox. It tells us that supply and demand are relevant: the supply will affect the price.
- When dealing with economists, scarcity is important! It is what we use for our "triage." The things that traditionally motivate conservation (biodiversity, wild nature) are the scarcest.
- Fresh drinking water is an example where we will be able to use technology to get out of the scarcity box, i.e. desalinization processes etc.

  - In your roles as people of conservation, can you give some examples of what you think are diamonds and what are examples of water?

Group Responses:
- Diamonds: honeybees and functional riparian ecosystems (in CA they are extremely scarce).

Group Comments:
- What if we do not want to accurately value an ecosystem? Maybe I just want to buy that ranch for $X? If I look into all the benefits of protecting the land, its value will increase and I will have to pay more for it. So why do I want to go out and find the real value if it might be worth more than the market value?

Boyd's Response:
- That is a good question and something you confront in markets every day. When you buy a house you do not tell the seller how excited you are about it because you want to get the lowest possible price.

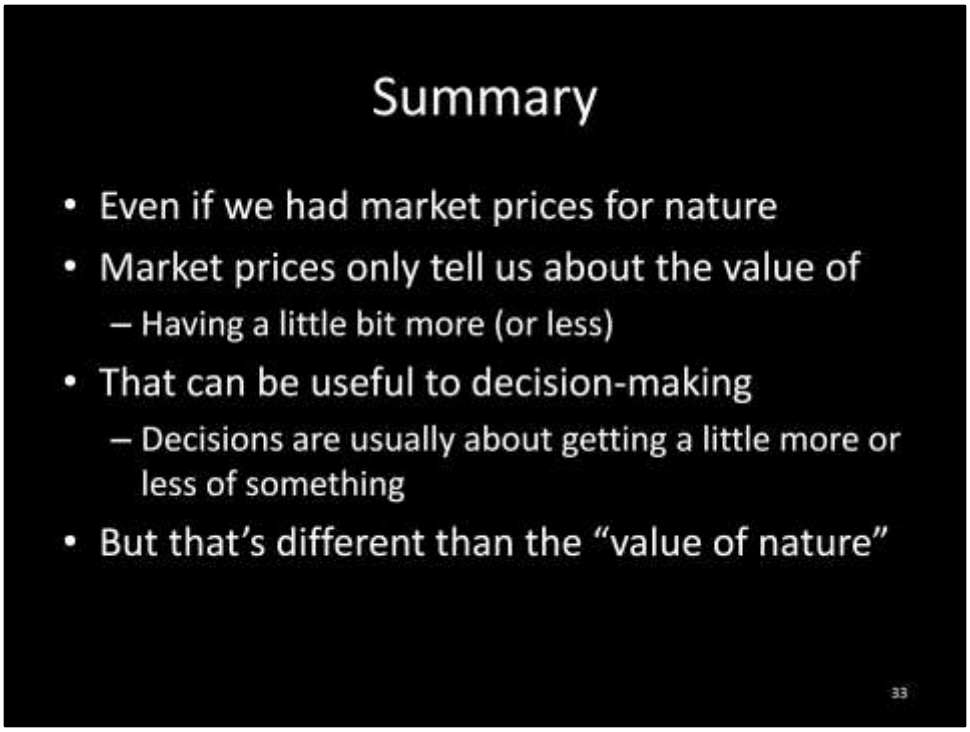


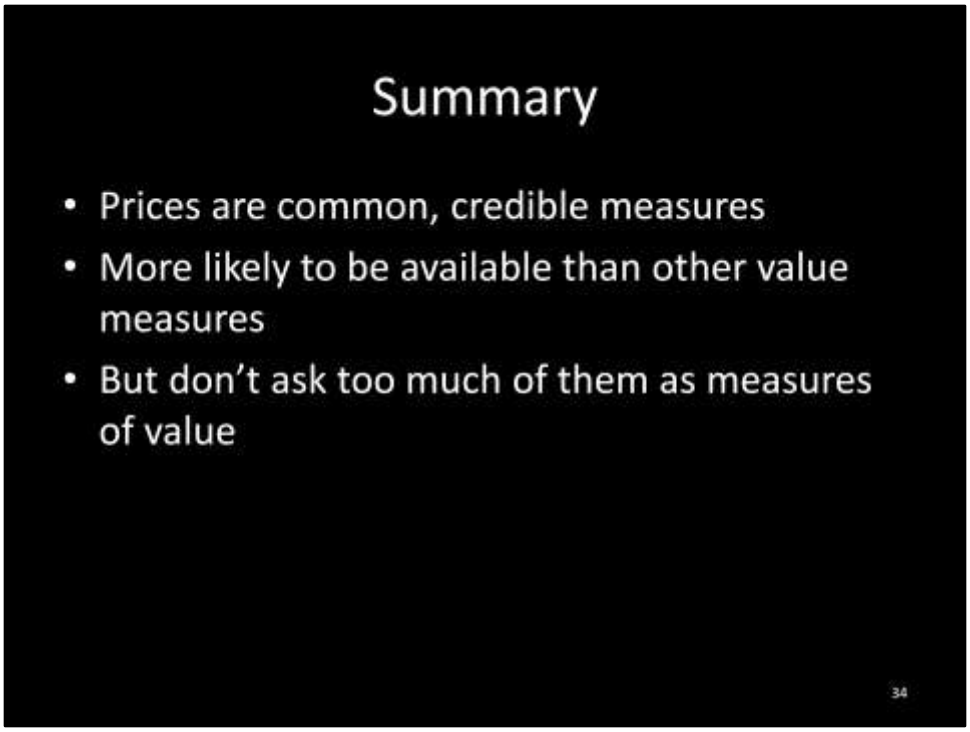
- This is the diamonds and water theme again. Prices and economics tell you about the marginal changes (i.e., if you change a little here and a little there, the price will rise and fall this much).
- What it does not tell you is about losing a lot of something. We do not have the evidence base for big changes, i.e. prices cannot say anything about losing all freshwater.

  - Does this statement frustrate you?

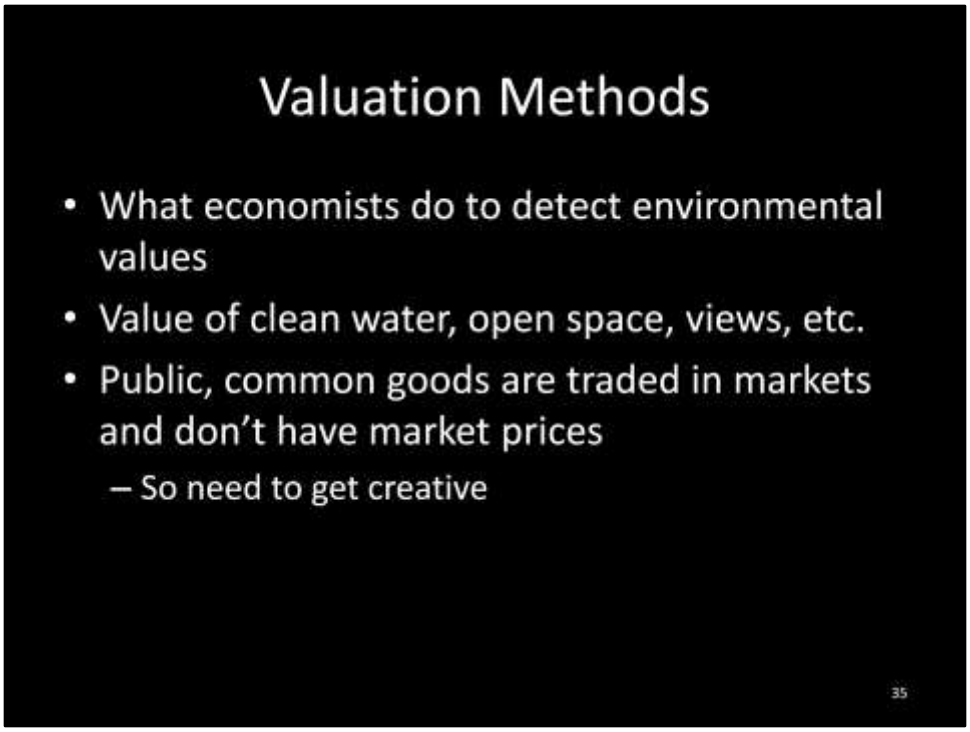
<u>Group Responses:</u>

- This is the idea that nature is too big to fail. Similar argument for the bank bailout.
- That is the climate change debate right now as well.

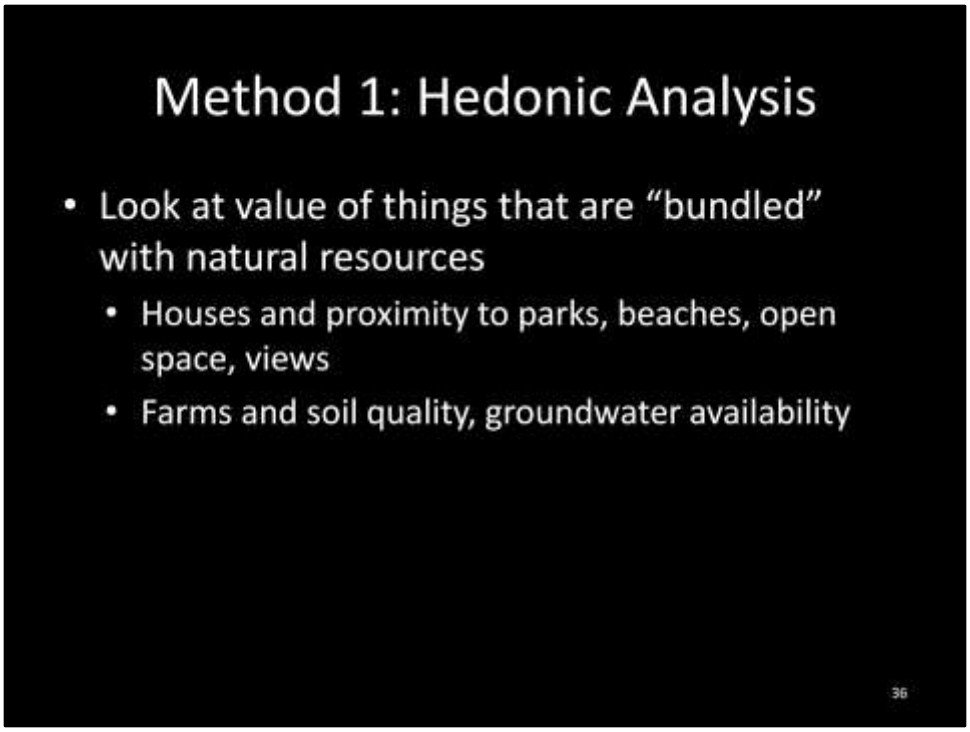

Summary
• Even if we had market prices for nature
• Market prices only tell us about the value of
– Having a little bit more (or less)
• That can be useful to decision-making
– Decisions are usually about getting a little more or less of something
• But that's different than the "value of nature"
33



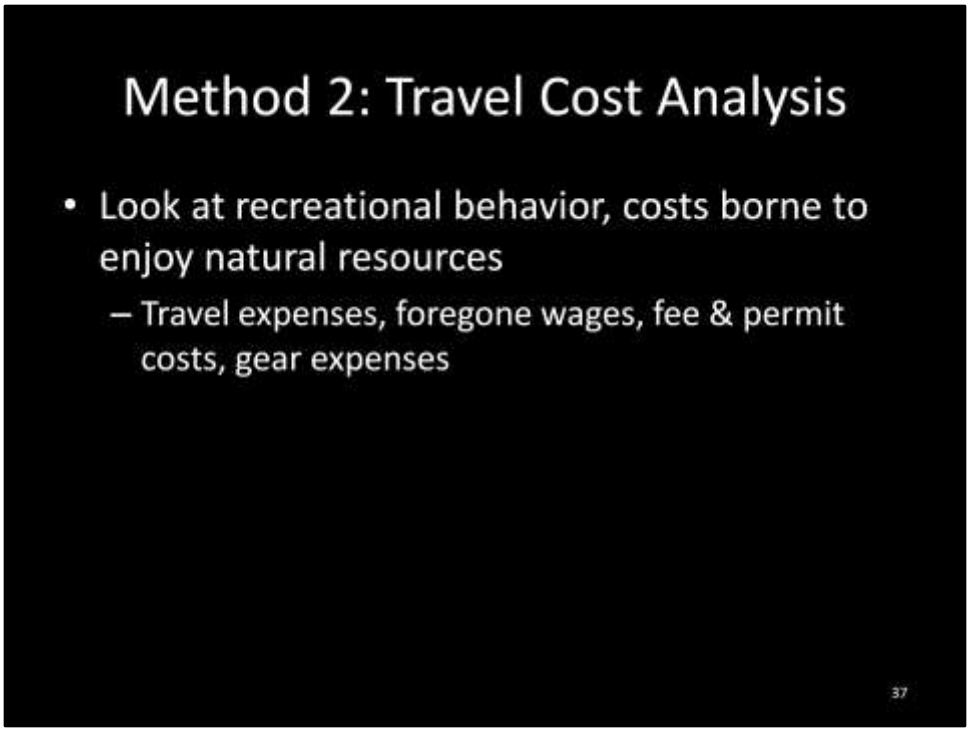
- Prices are common and credible, but you cannot ask too much of them. We use prices for specific reasons.
- Prices are not synonymous with value or values.



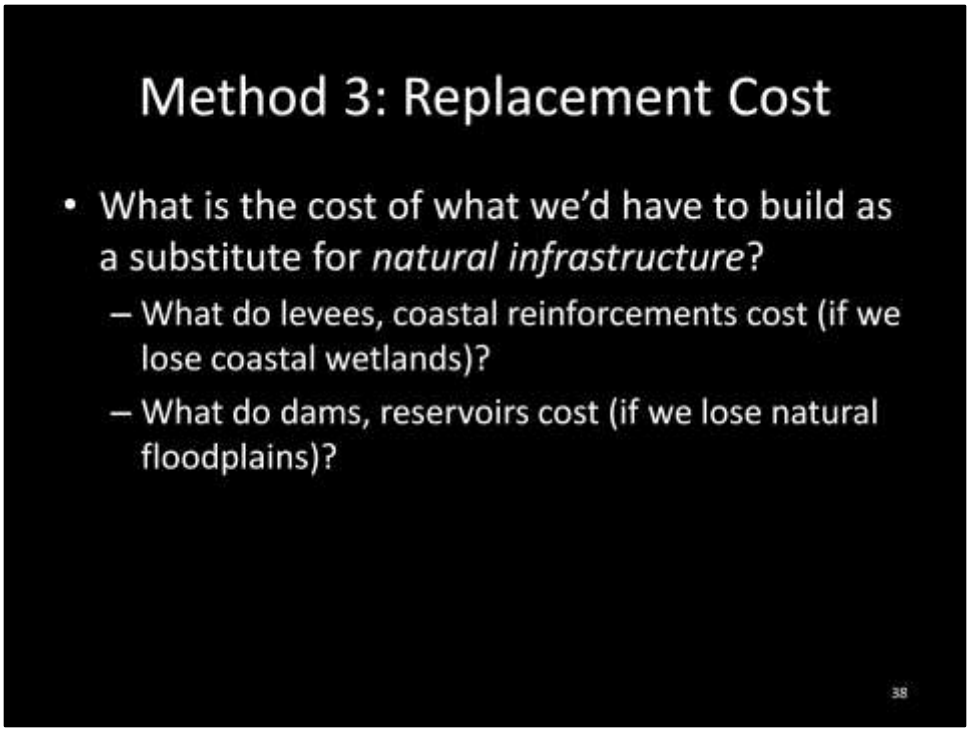
- The problem is that we do not have markets buying and selling this stuff. We do not have the data so we have to get creative to give it a value. Here is how…



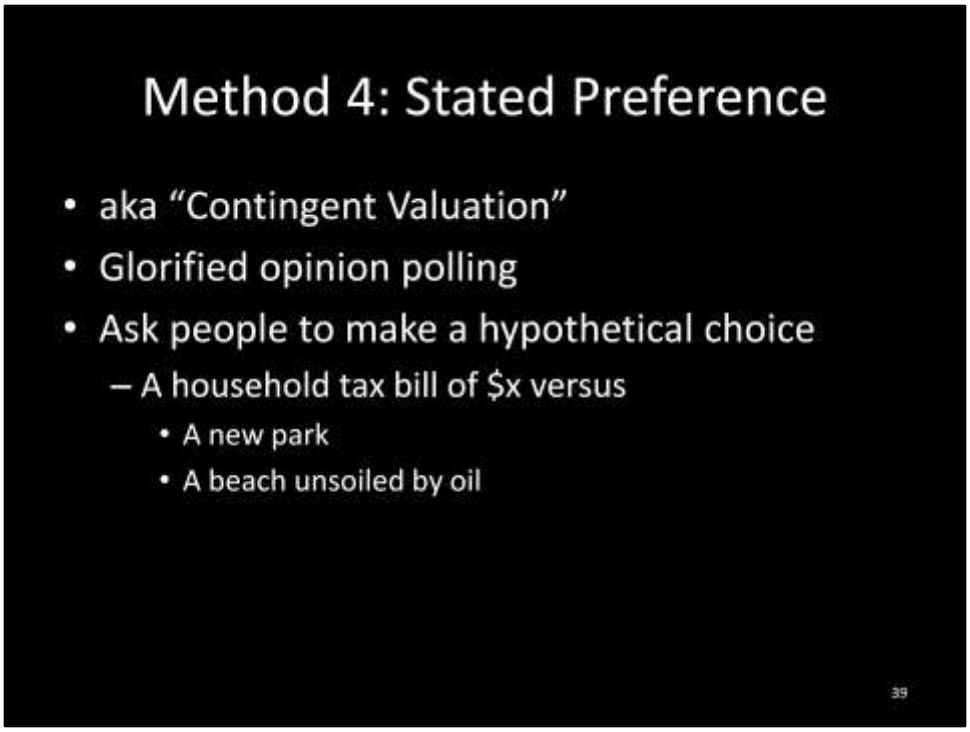
- In the first method, you relate housing values with associated amenities.
  - Palo Alto is a prime example. If you hold number of bedrooms, presence of a garage etc. constant, how much are houses valued here in comparison to same thing in a place without mountains and less open space?



- In this method, you look at how much people spend to go to the beach or to go fishing or how far they travel to get to the place in question. Essentially, you are trying to estimate how much people are giving up to go spend time at the location of focus.
- This estimate then becomes the lower bound. If you are spending at least that much, it must be worth more for you to give it up.

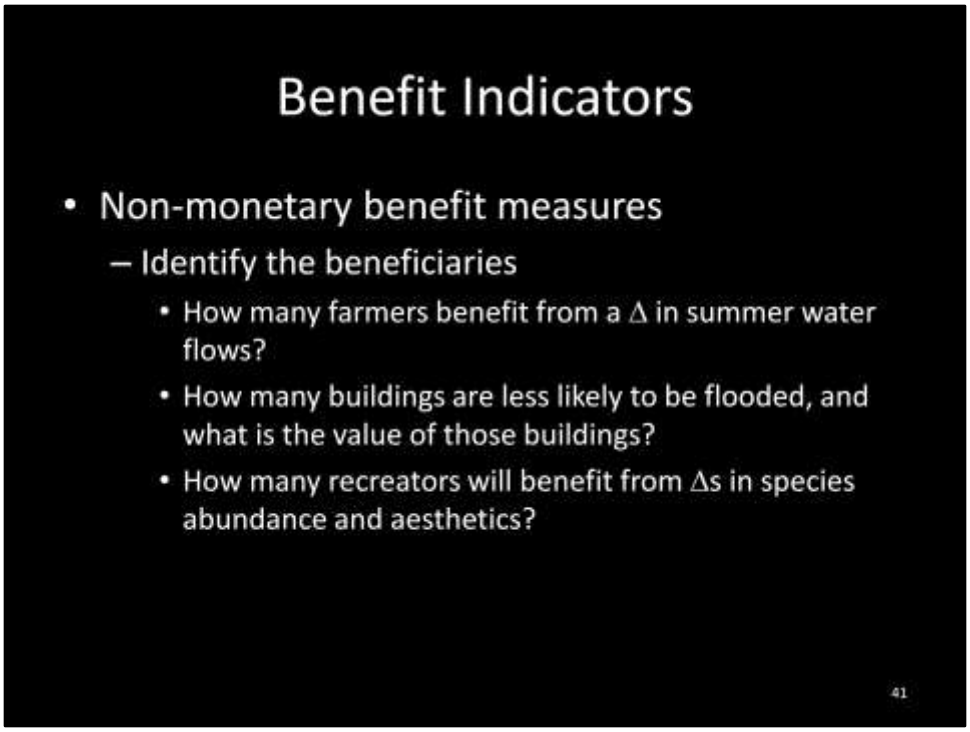


- Catskills watershed is the best example of this type of valuation method.
- For example, if we are looking into how to best lower New Orleans' flood risk, we can estimate the value of protecting the wetland by interpreting the cost of building levees around New Orleans. Then the cost of protecting the wetland is at least the forgone cost of building the physical infrastructure.



- This method is essentially just very structured opinion polling.
- There is a lot of literature on how to do this.
- The shortfall to these kinds of studies is that the people interviewed are not really putting their money on the line and you can run into the issue where respondents answer in a way to please the survey giver. However, there are ways around those errors.

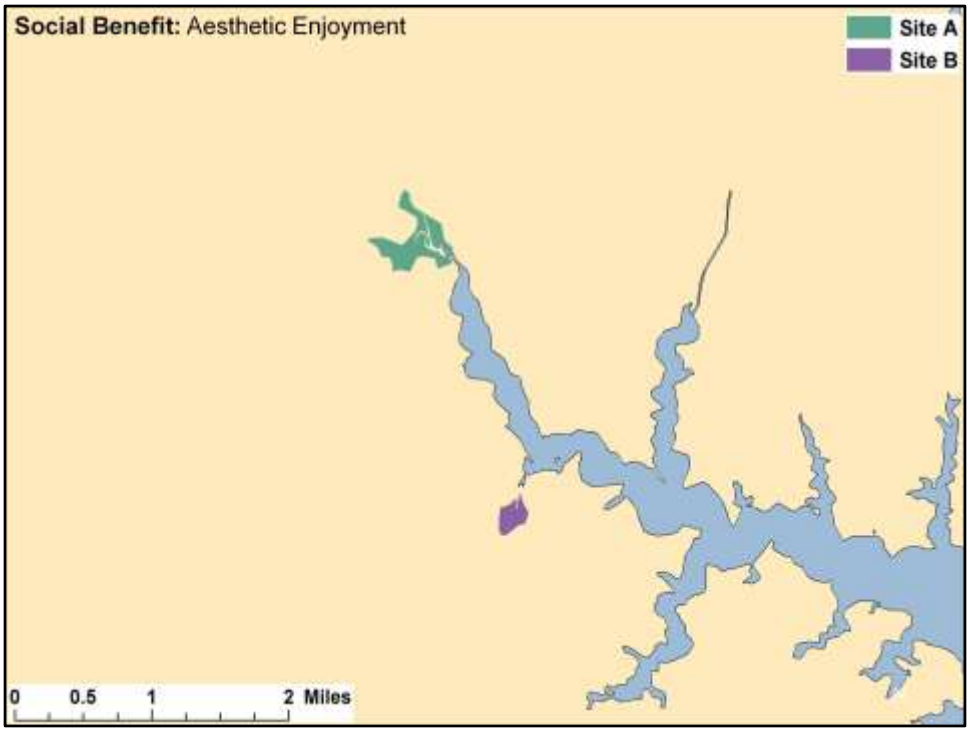
- I want to spend more time on non-monetary valuation.
- The idea is that there are quantitative things we can do to tell the story about how ecosystem goods and services are affecting people. I call them **benefit indicators**. This is another way of conveying the benefits of nature and I think this is a strategy worth pursuing in certain contexts.



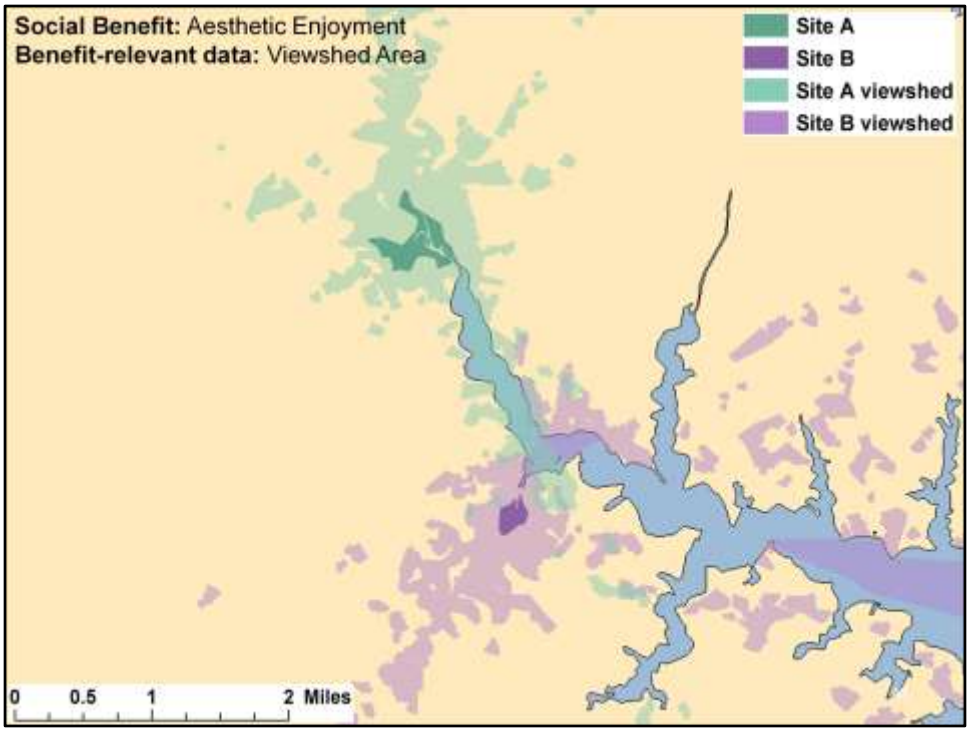
Let us work through an example…

- If we manage the forest or watershed in a certain way what will happen?

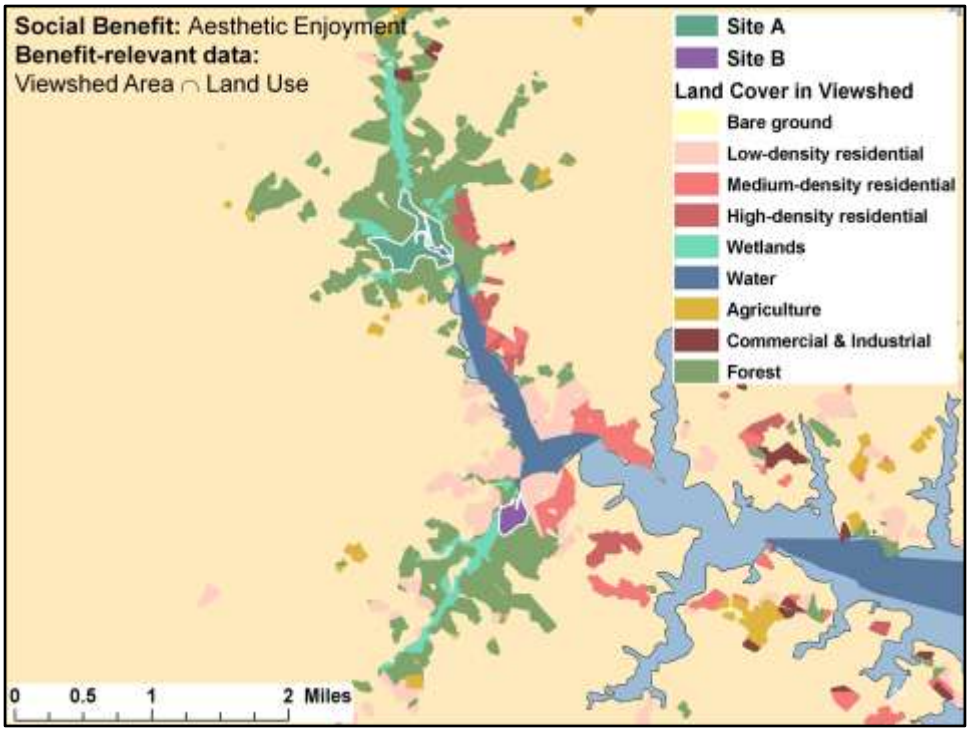
- If we can get farmers to store water on their land, they may get more water when they need to irrigate in summer months.
  - How many farmers benefit? How many households?
- It is relatively easy to get the information of how many will benefit: you count them!
  - We have data on how many people live in certain areas, how many people visit parks, and how many people drive on 280 etc.
- We can look at this data to estimate how many people a new type of watershed management will affect. The whole point is that you want to connect beneficiaries with benefits.



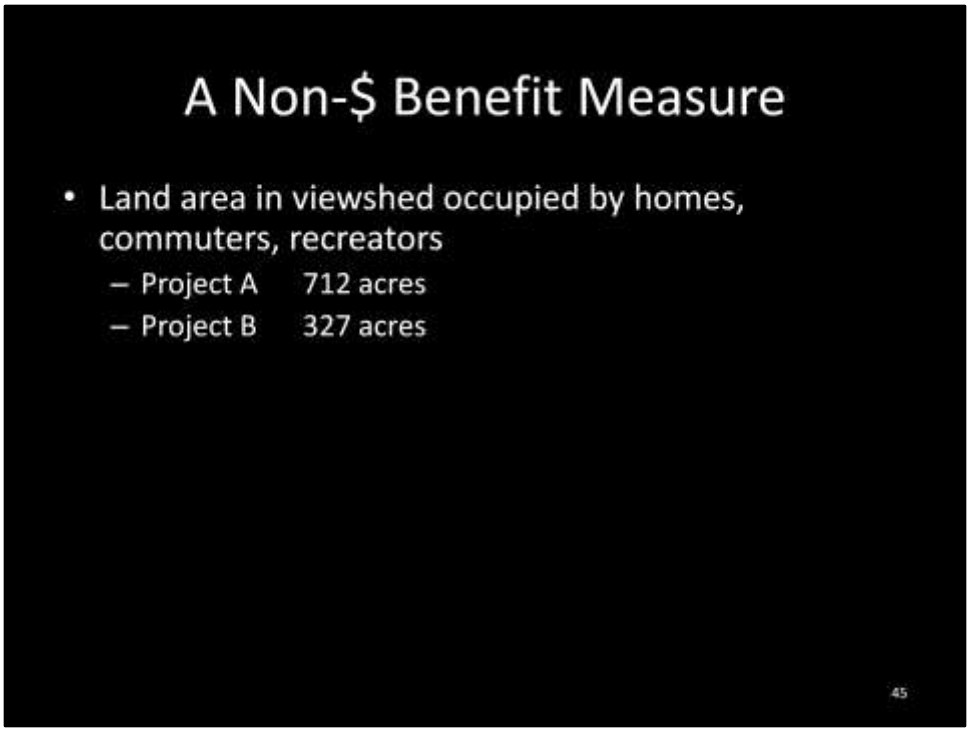
- This is an example of visual and numerical components and how it might affect the analysis.
- We have two sites: A and B. We have to choose one to protect. Let us look at benefit indicators to decide which site we should protect.



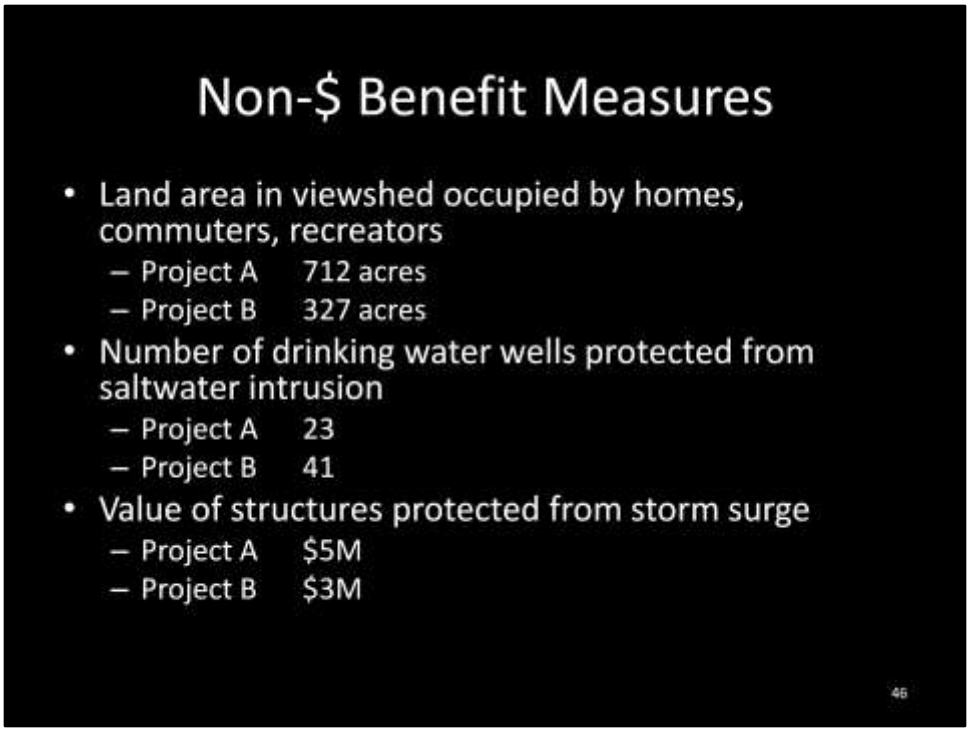
- First benefit indicator: visual access.
  - Identify which areas can see the protected area. This is easy to do with GIS.



- Second benefit indicator: land use.
- With this indicator, we go a bit further in depth and see the kind of land in the view shed.
- From this, we can get a sense of how many people will enjoy the protection of site A vs. B.



- Now we have information that begins to tell an economic story.



- So again, this is quantitative and easy to measure and helps to tell the story about what is going on in this area and in the context of choosing which site to protect.
- Imagine now you are in a planning meeting and someone gives you this information rather than the final value.

- Here we see a final dollar value obtained from protection site A vs. site B.
  - ➢ Which method do you prefer and why?

Group Responses:

- The previous example that lists the benefit indicators is more comprehensive and seems to be easier to work with.
- The single dollar value is made up of many implicit components and is amorphous.
- From a public policy standpoint, it is helpful to have the different perspectives explicitly stated as in the benefit indicator method. It also opens the possibility of different solutions. Maybe a solution is buying those homes and doing something else at the same time.
- I agree. You do not really learn anything from the number. The non-monetary way allows you to engage your own intelligence and allows you to present and utilize the information in a stakeholder process.
- With the benefit indicators, you now have to argue about the components and what is worth more. The politics are out in the open. The dollar value is deceptive. What if you could estimate the values across a range of different weightings? People run the risk of arguing about how much a water well is worthwhile forgetting the main issue.
- We need to keep our eyes open. These are benefits that address risks that

sometimes should not be there in the first place, i.e. we are calculating benefit of flood risk aversion for houses that should not have been built in the flood plain.

> ➢ Should we give this presentation to the business community rather than the conservation community? One reason we started to give nature a value was that it gave us a way to talk to the business community.

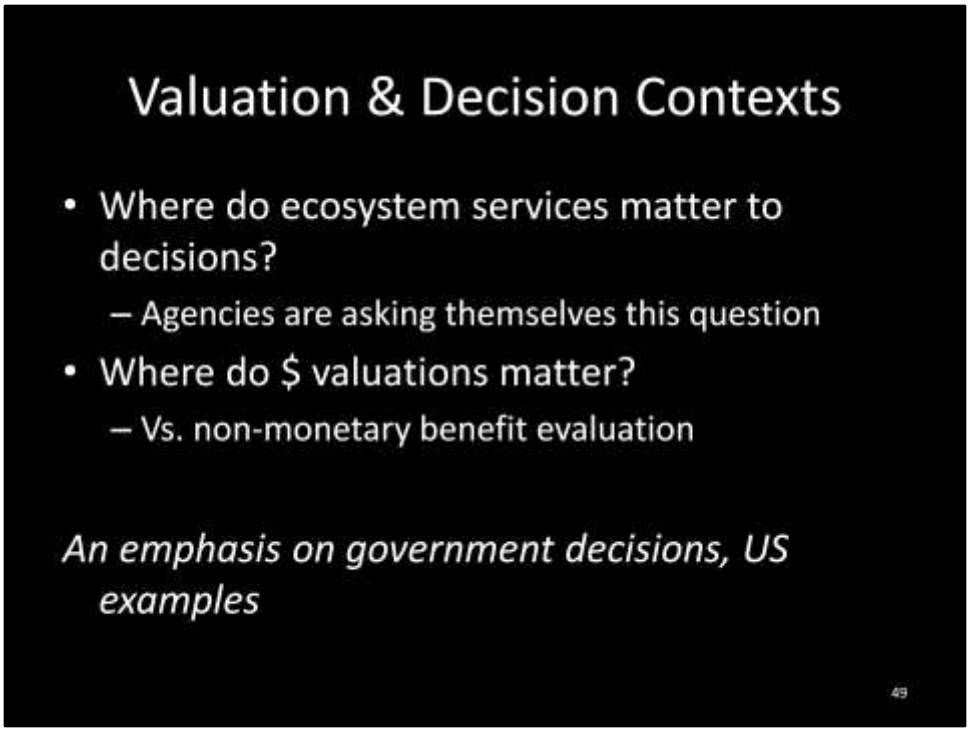
- Boards of directors of public businesses are legally required to maximize shareholder value. They are not in the business of maximizing social value rather they are in the business of maximizing their own value.
- Some fraction of the value will benefit businesses, some fraction will benefit landowners, but you do not see that in the dollar amount.

> ➢ Can you explain whether these two methods are mutually exclusive?

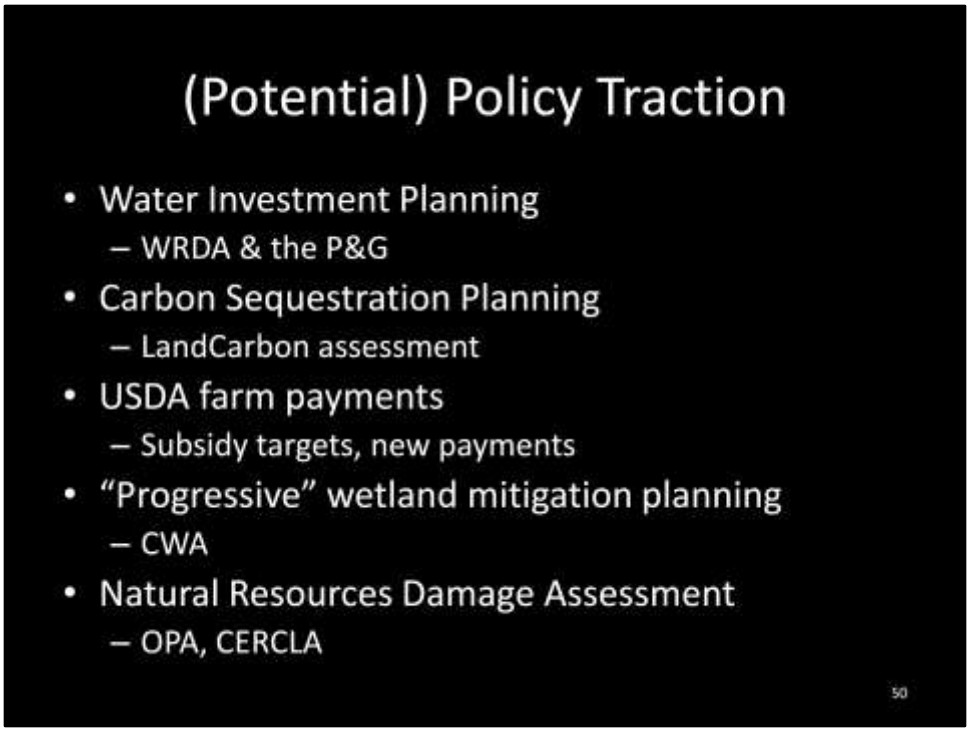
<u>Boyd's Reply:</u>

- Ideally, you want the best of both worlds. You would do both methods and they would talk to each other. I do not want you to walk away thinking these are mutually exclusive, but I do want you to recognize that people spend the lion share of time on the final dollar method instead of the one that utilizes benefit indicators.
- Benefit transfer is when you take the valuation study someone did somewhere else and you try to apply it in a new place. This depends on how similar the objects are between sites.
- It will not get you around fundamental conflicts. For instance, it will not inform you on whether we should we be moving away from people because the land is cheaper and there are intact corridors or if we should bring this home into people's yards and get more "economic" value. It is designed to illuminate this scale.

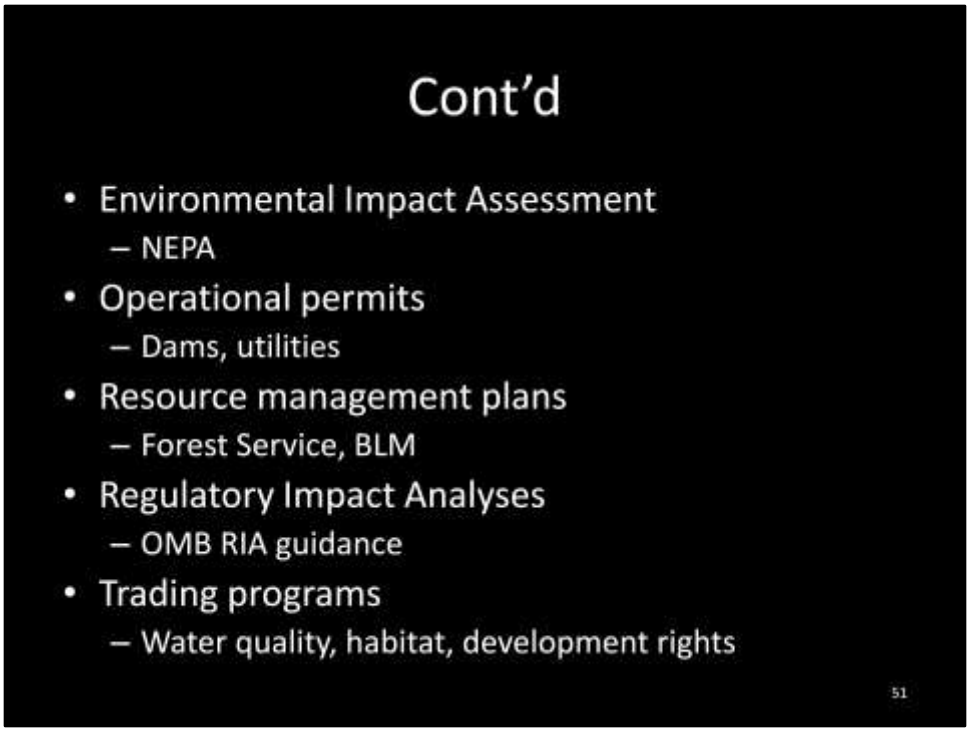

$ Monetary Valuation $
• Can
– *Obscure* nature's value
– Bore people
– Disenfranchise stakeholders
48



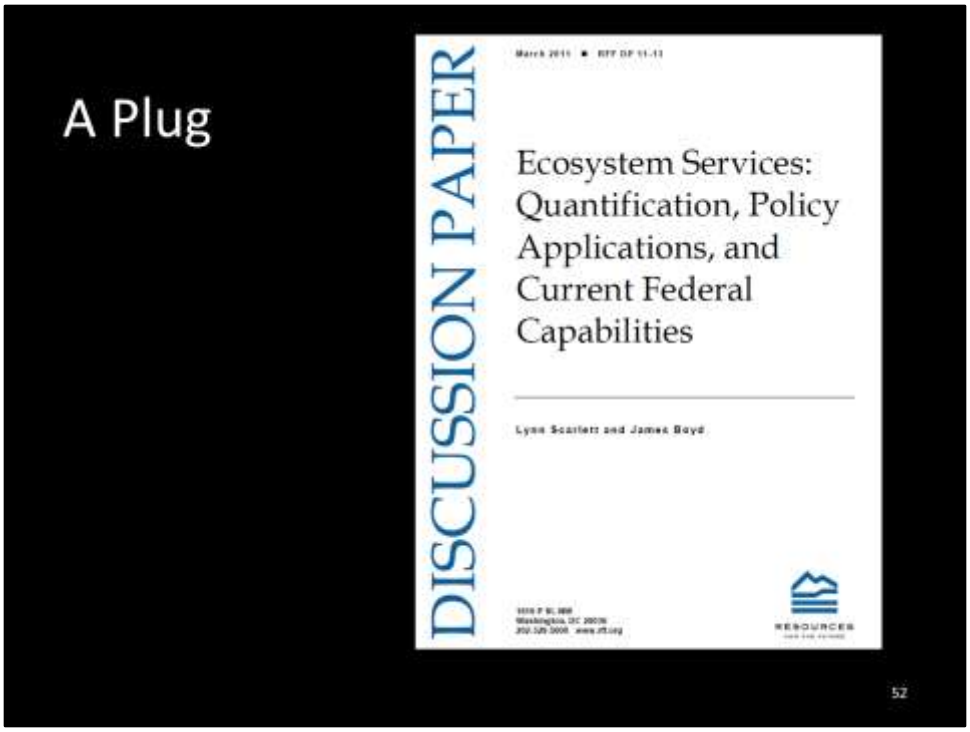
- There is a hunger for this type of work.



- There is a huge amount of applicability and hunger for this. I list a few examples on the slide. I will focus more on opportunities in government.
- People are talking about what they will do with the valuation once they get it.
- Water Resource Development Act (WRDA) has a lot financing for water projects and affects entire surface water of US. They reevaluate it every two years and it is governed by the Principles and Guidelines document, which now mentions ecosystem services throughout. It primarily asks the Army Corps of Engineers to include ecosystem services when they plan and finance these projects.
- United States Geologic Survey (USGS) was asked by congress to give a map depicting where and what to plant in order to hit carbon sequestrations targets. Now they are working on building co-effects into planning
- Unites States Department of Agriculture (USDA) has targeted payments and there is talk about revising them.
- Clean Water Act (CWA) is taking a regional more ecosystem-based management approach. If you can put the value on these, it will help.
- The laws will be pretty flexible and welcoming to valuation.

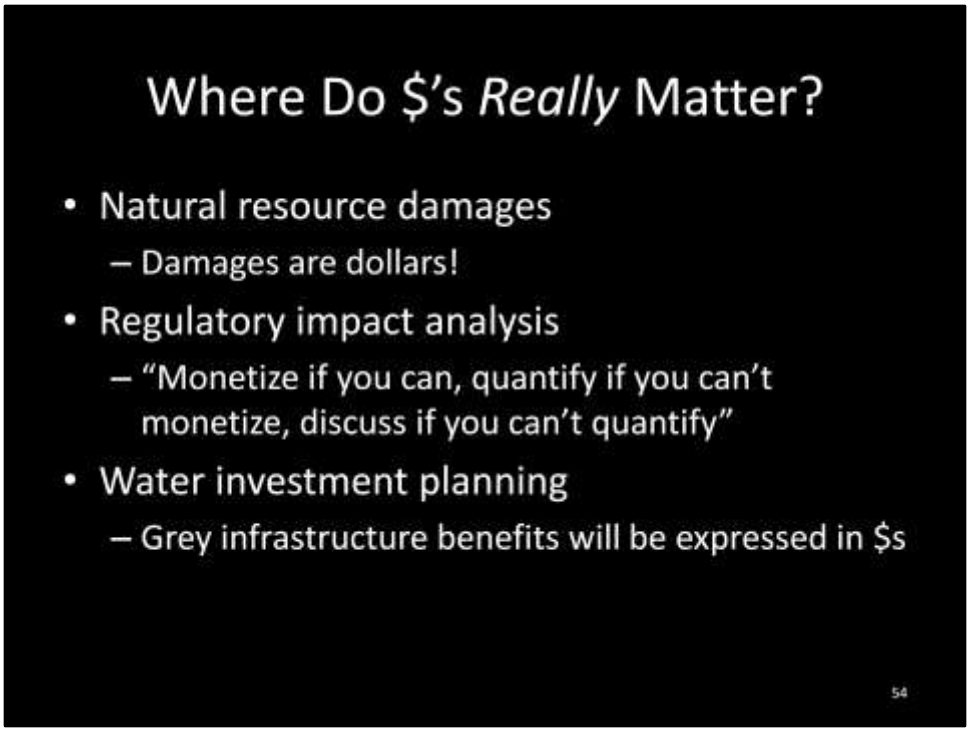


- This slide lists some additional opportunities.

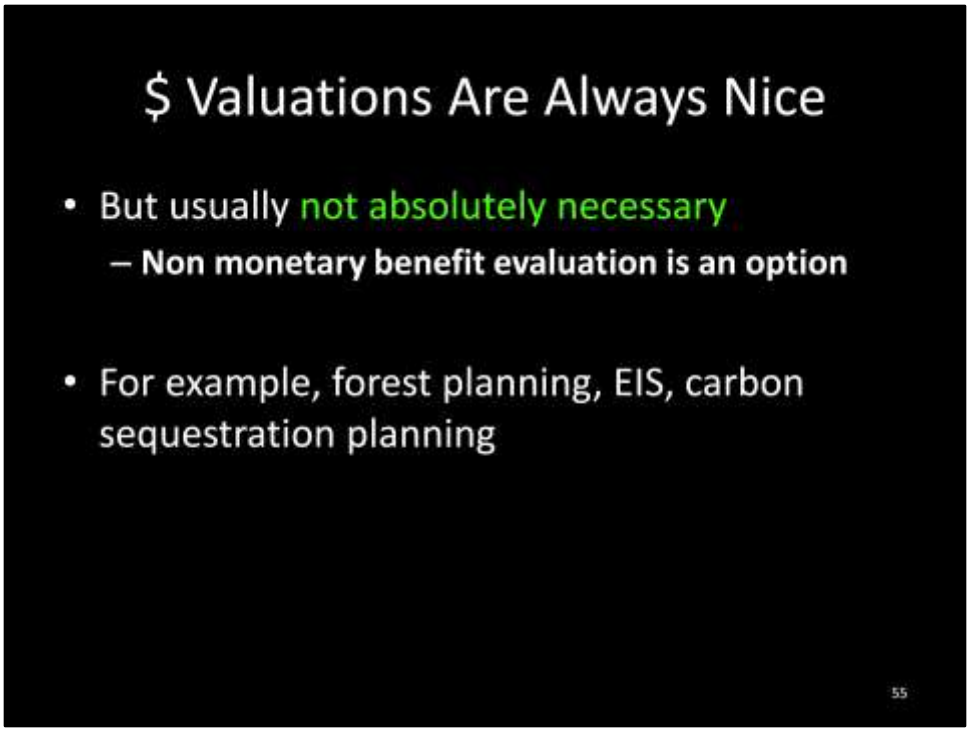


- This paper gets into more specific examples of how we can apply economic valuation. It is available at http://www.rff.org/Publications/Pages/PublicationDetails.aspx?PublicationID=21513

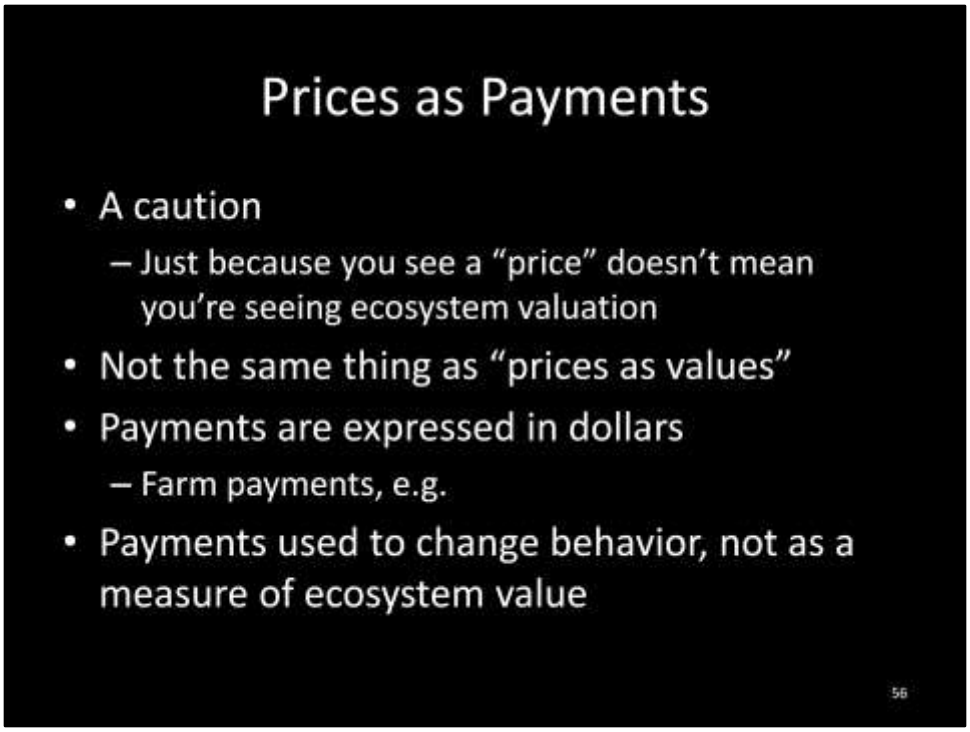
- Good news: The laws and policy are ready; they are not the constraint.
- Bad news: The greatest challenge is how to deliver the information and bring the best science to bear in ways that are useful to policy implementation. Also challenging, is the ability to deliver analysis (biophysical and economic).



- Office of Management and Budget is asking that all departments monetize regulations and potential benefits. Can be quantified if not monetized.

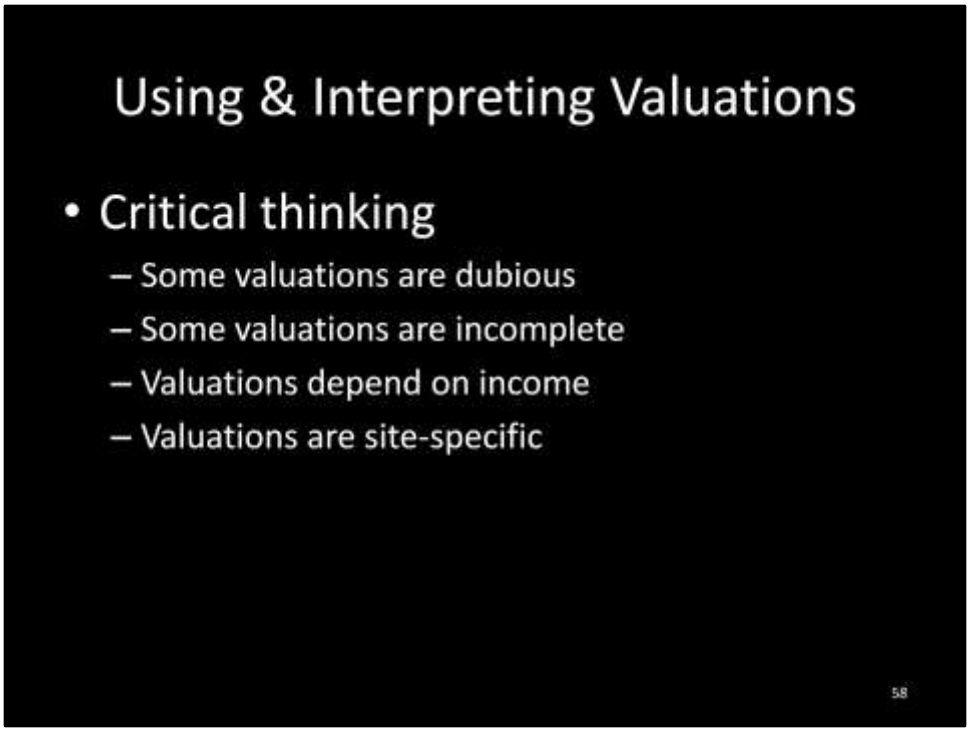


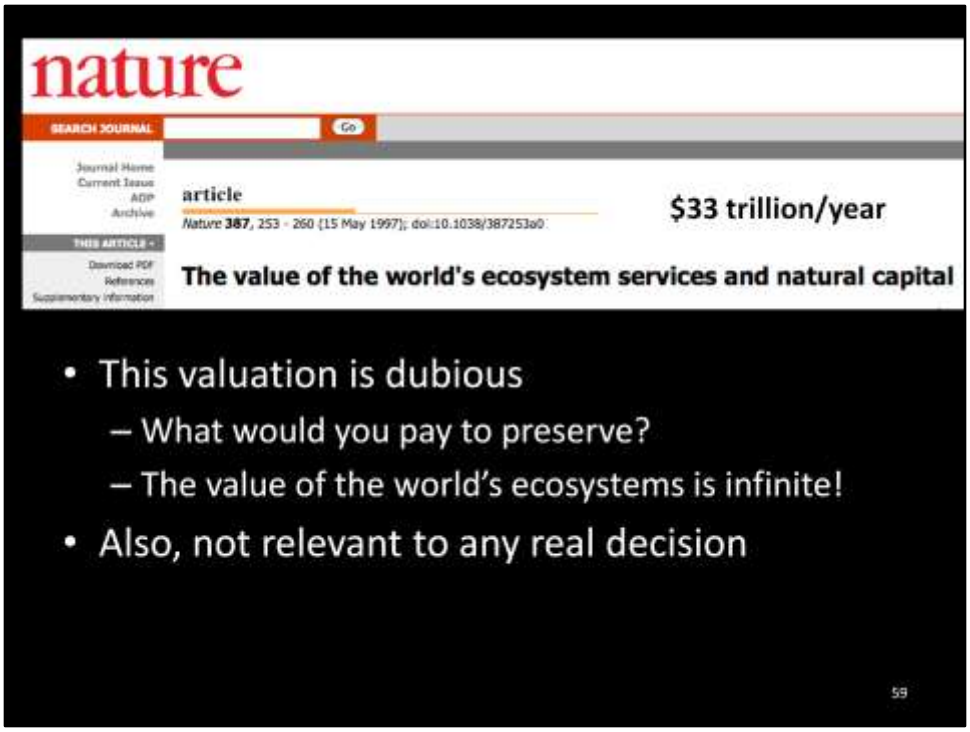
- Reminder: Dollar values are not always necessary in this.



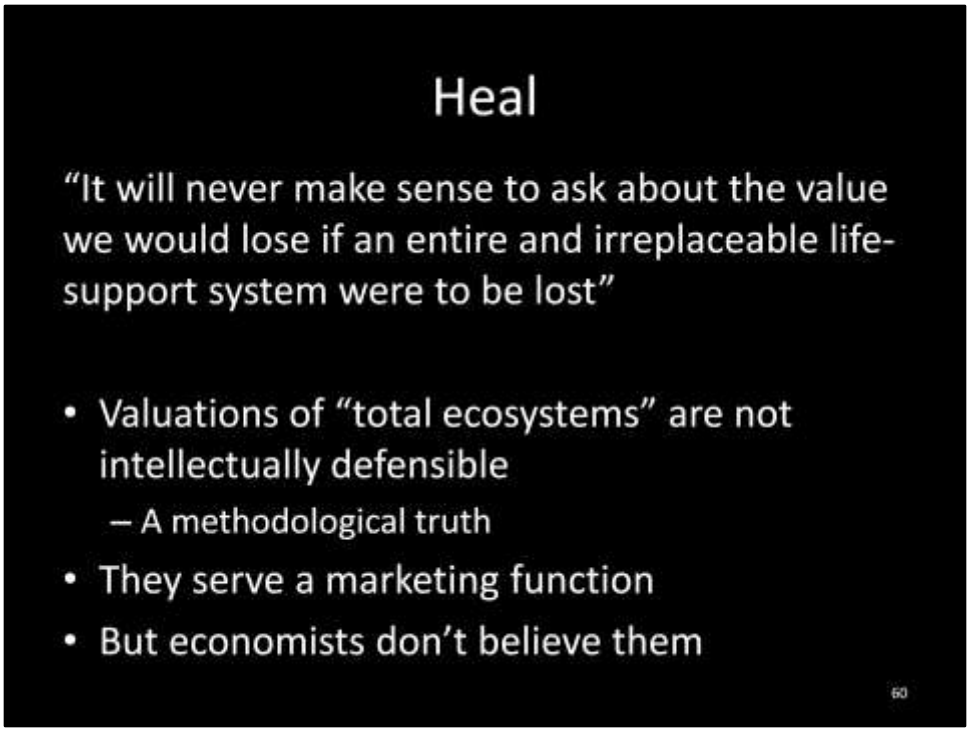
- You might see a price, but remember that it does not always indicate value.

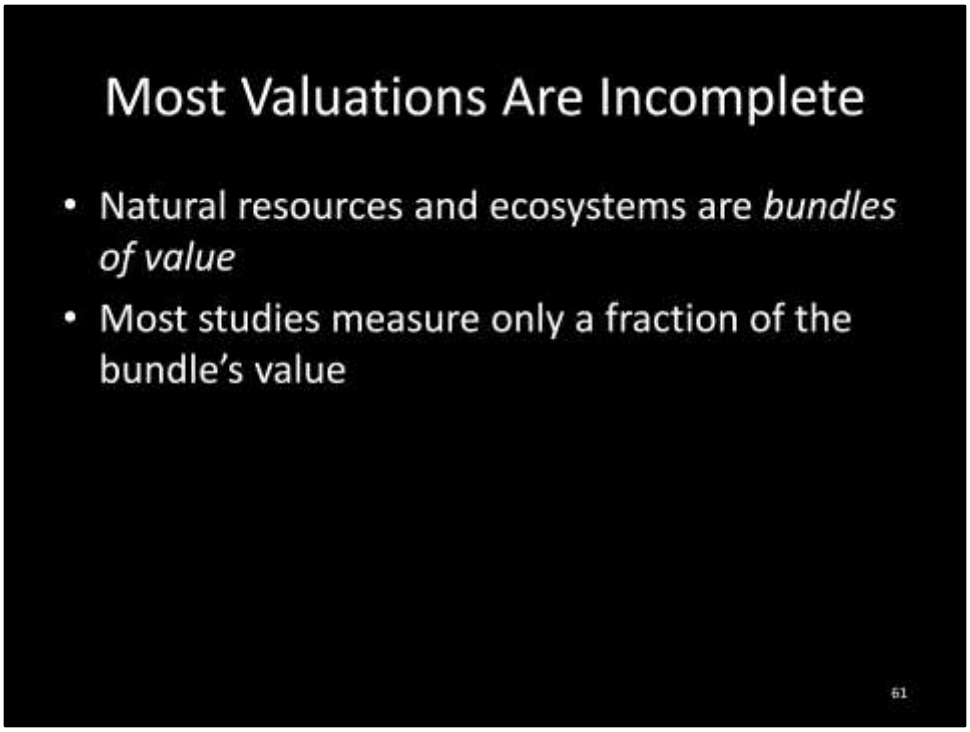

Prices From Environmental Markets
• Cap and trade, mitigation rules
– A price *emerges* from the market, it is not calculated in advance
– The price doesn't reflect ecological benefits
– Reflects benefits of reallocated control activity
57


Using & Interpreting Valuations
• Critical thinking
– Some valuations are dubious
– Some valuations are incomplete
– Valuations depend on income
– Valuations are site-specific
58

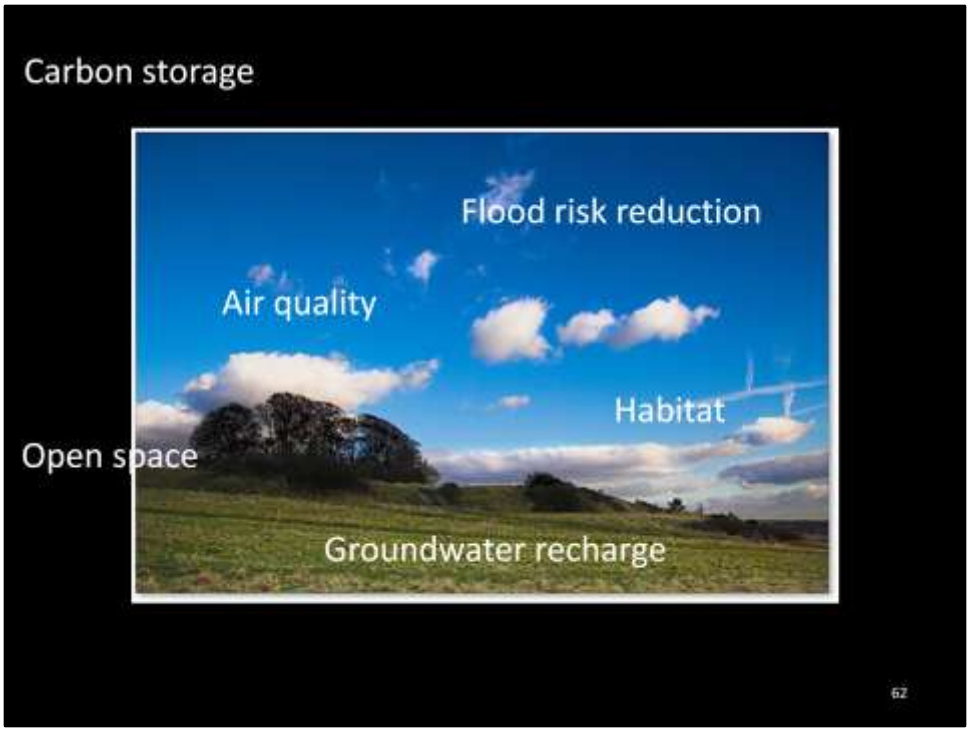


- This is the headline form the famous study by Constanza et al.
- The study was very important and very influential and I love them for it, but it is totally unbelievable and drives economists nuts.
    - The value of the world's ES is infinite.
    - The study was not based on real choices or real decisions and you cannot get values without those. The way we get values is by looking at **real behavior and real choices**.
    - This is more evocative and not relevant to realistic choice.

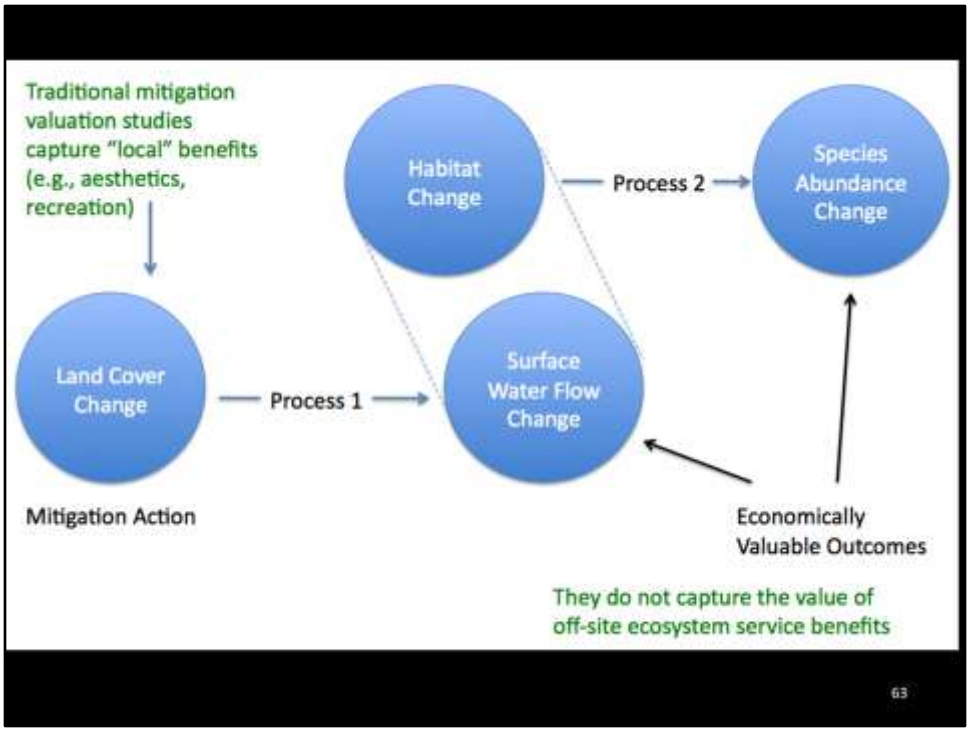

Heal
"It will never make sense to ask about the value we would lose if an entire and irreplaceable life-support system were to be lost"
• Valuations of "total ecosystems" are not intellectually defensible
– A methodological truth
• They serve a marketing function
• But economists don't believe them
60

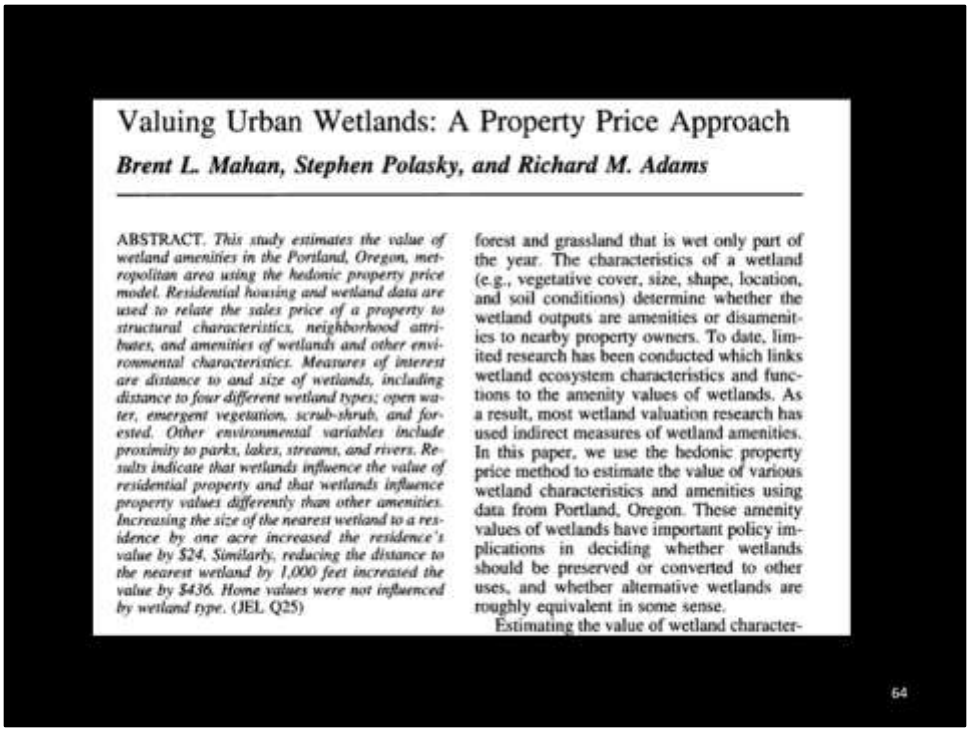


- This is very important. A criticism of academia: Most valuations are incomplete and should thus be taken with a grain of salt.



- In this landscape, there is a bundle of valuable stuff. Because of the methods we use, we do our study with the data we have and we measure only one or two of these things NOT all of them, thus the valuation is incomplete.


Traditional mitigation valuation studies capture "local" benefits (e.g., aesthetics, recreation)
Habitat Change
Process 2
Species Abundance Change
Land Cover Change
Process 1
Surface Water Flow Change
Mitigation Action
Economically Valuable Outcomes
They do not capture the value of off-site ecosystem service benefits
63



Valuing Urban Wetlands: A Property Price Approach

Brent L. Mahan, Stephen Polasky, and Richard M. Adams

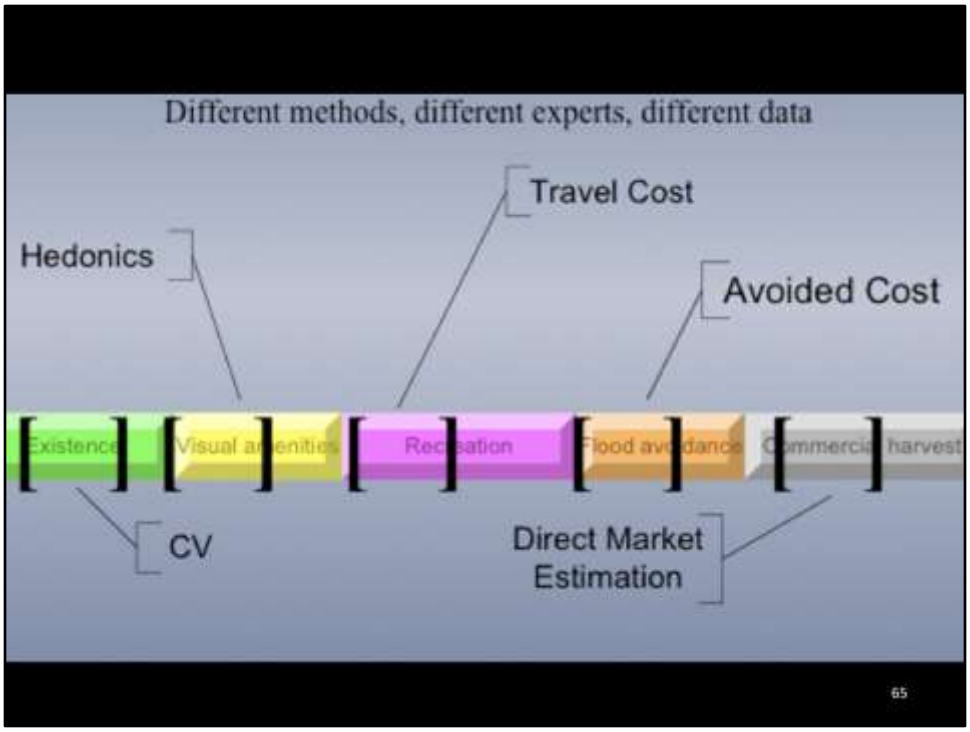
ABSTRACT. *This study estimates the value of wetland amenities in the Portland, Oregon, metropolitan area using the hedonic property price model. Residential housing and wetland data are used to relate the sales price of a property to structural characteristics, neighborhood attributes, and amenities of wetlands and other environmental characteristics. Measures of interest are distance to and size of wetlands, including distance to four different wetland types; open water, emergent vegetation, scrub-shrub, and forested. Other environmental variables include proximity to parks, lakes, streams, and rivers. Results indicate that wetlands influence the value of residential property and that wetlands influence property values differently than other amenities. Increasing the size of the nearest wetland to a residence by one acre increased the residence's value by $24. Similarly, reducing the distance to the nearest wetland by 1,000 feet increased the value by $436. Home values were not influenced by wetland type.* (JEL Q25)

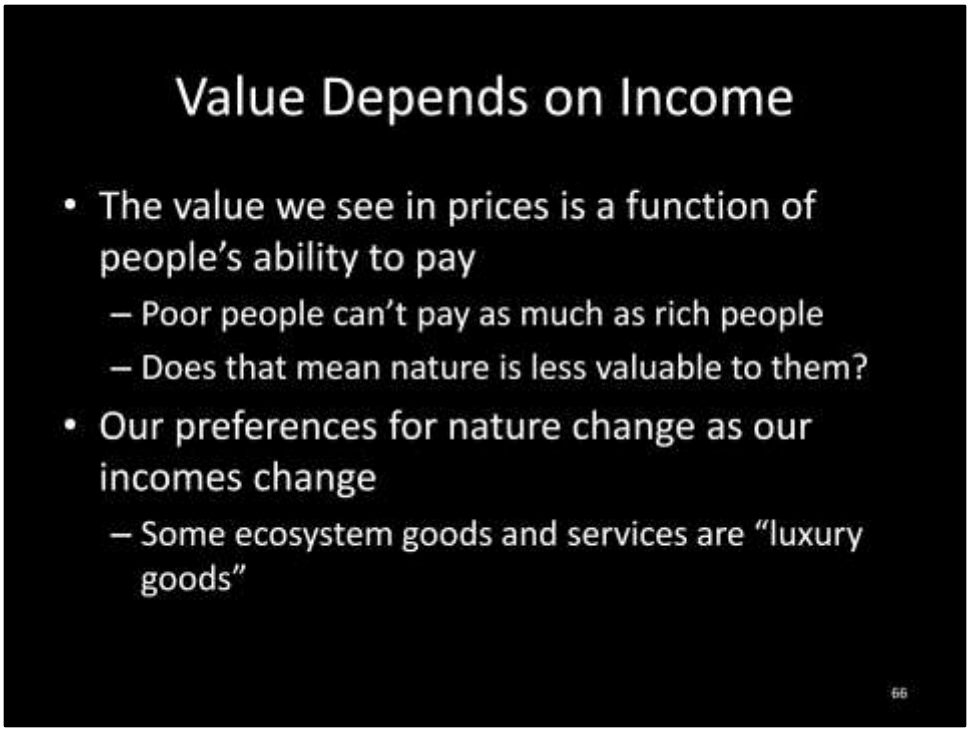
forest and grassland that is wet only part of the year. The characteristics of a wetland (e.g., vegetative cover, size, shape, location, and soil conditions) determine whether the wetland outputs are amenities or disamenities to nearby property owners. To date, limited research has been conducted which links wetland ecosystem characteristics and functions to the amenity values of wetlands. As a result, most wetland valuation research has used indirect measures of wetland amenities. In this paper, we use the hedonic property price method to estimate the value of various wetland characteristics and amenities using data from Portland, Oregon. These amenity values of wetlands have important policy implications in deciding whether wetlands should be preserved or converted to other uses, and whether alternative wetlands are roughly equivalent in some sense.

Estimating the value of wetland character-

64

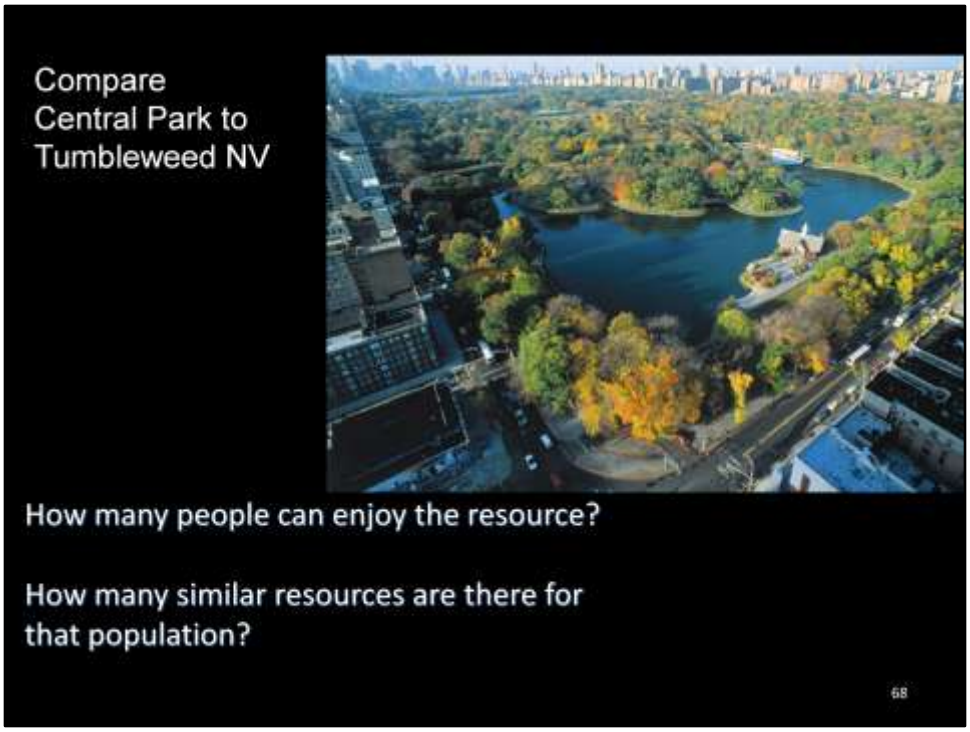
- Here is an example of a study that showed that houses are more valuable when near a wetland. You need to read the evaluation carefully to recognize that it utilized a very narrow scope for the evaluation. The authors discuss this fact extremely well in the paper, but you have to read thoughtfully to get it.
- The lesson here is to read the studies knowing that the science is limited. The authors know this and sometimes it is hard to convey and hard for non-economist readers to understand.


Different methods, different experts, different data
Travel Cost
Hedonics
Avoided Cost
Existence
Visual amenities
Recreation
Flood avoidance
Commercial harvest
CV
Direct Market Estimation
65

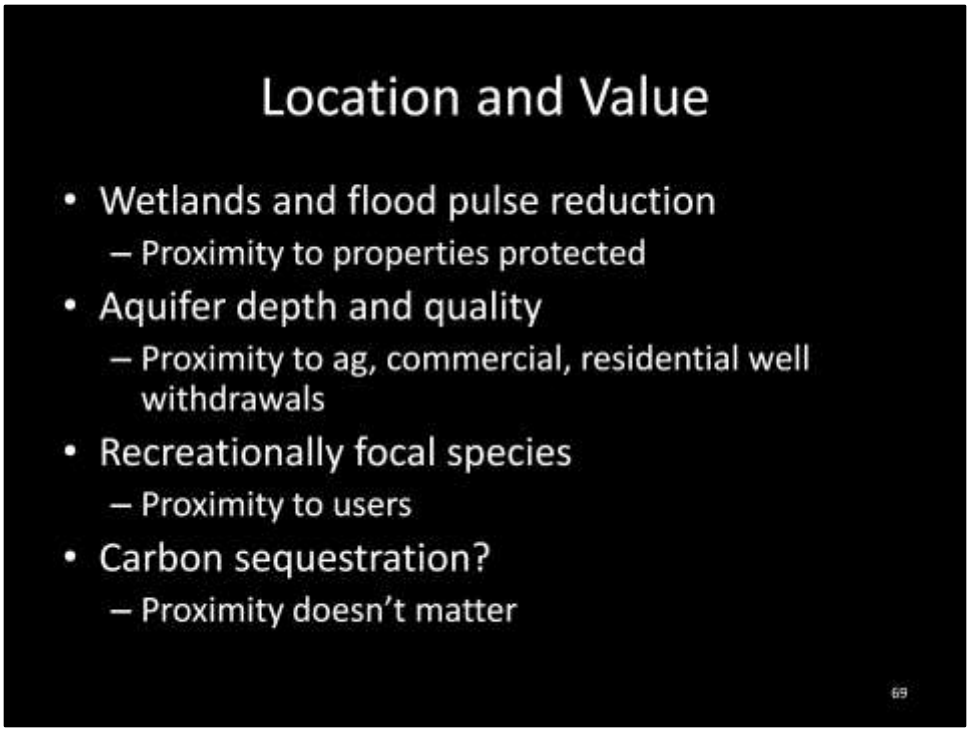


- Another danger is that valuation totally depends on income.
- How much you have to spend in general dictates how much you are willing to spend on nature.
- Value is contingent on these disparities of income.

- Ecosystem services values are almost totally dependent on location. This is partially due to the nature of the system's ecology. Just like your house, the value is based on where it is and it proximity to schools, parks etc.



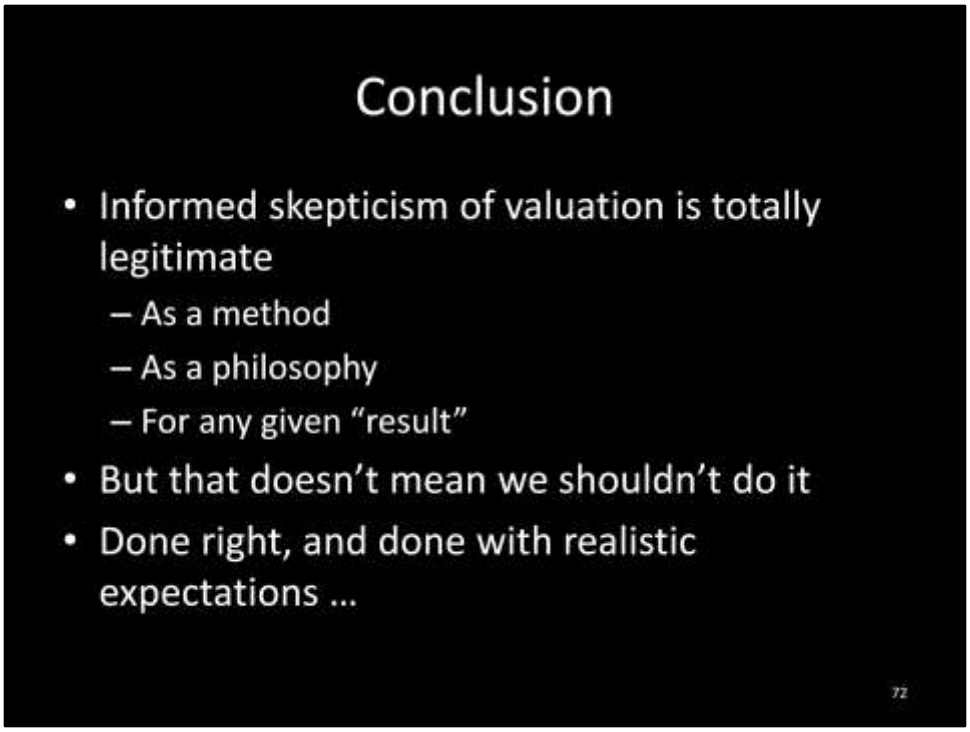
- Central Park is probably not that ecologically important but it is very valuable because of its location. It is the only green-space resource for many people. It is a diamond!
- A biophysically equivalent space in Nevada would be worth much less, because people around it would value it differently.


Location and Value
• Wetlands and flood pulse reduction
– Proximity to properties protected
• Aquifer depth and quality
– Proximity to ag, commercial, residential well withdrawals
• Recreationally focal species
– Proximity to users
• Carbon sequestration?
– Proximity doesn't matter
69

- The more substitutes that exist, the less scarce your resource is.
- Co-locations with other resources is important. There are other amenities that can enhance the experience

To conclude:

- There is great receptivity between ecology and economics right now. I remember when it was not so and now the world around us wants ecology and economics to work together and it is happening.
- Conservation Measures (CMP) and Results Based Management (RBM) are looking to quantify and evaluate outcomes of conservation. There has been tremendous progress in that realm.
- Wealth Accounting and the Valuation of Ecosystem Services (WAVES) is working to improve the kind of information available to decision makers on a national scale, so that they may better make development decisions.



- If you feel skeptical, that is okay.
- I hope I have convinced you that we should do it anyway. If we acknowledge what is wrong with valuation, we can move forward with realistic expectations.

Valuation

- Communicates an important truth
  - Nature is valuable
- Complements purely biophysical messages
- Underscores breadth of nature's social benefits
  - From the sacred to the mundane
- Reaches and can influence important audiences

73

Seminar 3 Discussion Synthesis

May 31, 2011

This document is a synthesis of important topics and questions discussed during the question and answer period immediately following Dr. James Boyd's presentation. Please keep in the mind that the following is only a recap and speaker identities have been removed, except for Dr. Boyd. We hope that the following notes and discussion questions will be used as resource to advance further discussions about ecosystem services.

Below you will find a summary of specific key questions and topics that were covered during the Seminar discussion.

Question 1

One thing I have noticed when dabbling with monetary and non-monetary valuation is that large numbers can be hard to grasp. A disconnect exists between large numbers and bundled values as well as between the tangible and intangible values. Is there an answer to help build the connection? Would a local scale suffice?

DR. BOYD

- Big numbers function in a very different way. I think of them as a tool of the popular media to connect with an audience that is not actually making decisions on the subject at hand. The numbers are usually just a component to influence the popular audience.
- I do think that working from the household level to get at valuation is important and is something I would like to pursue. We should reach out to people and educate them as well as get them to educate us. When you work at the household level, you encourage this and by listening, we learn a lot about why people value nature.
- We tend to fill the vacuum with our own thoughts about why we think nature is valuable while we have a lot to learn about why other people think it is valuable. We may not necessarily like the answer, but it is an answer nonetheless and therefore valuable.
- When you provide a huge number, it does not really help beyond describing a limited picture. I would say that by working from the household level, we would get a stronger understanding of valuation and build a more descriptive scenario. From there we can scale up to the country, state, and national levels (however, we must be careful about how this is done). Once you have a strong understanding of how and why people value nature, you can begin to use numbers again.

Question 2

Do you have guidelines or can you recommend a handy rubric for when you should trust an economist's valuation? I am thinking about how information is presented. For example, I may not care if something is worth US $2 million, but I will care if it will save the lives of 300 children. If you are trying to develop a compelling analogy, how do you know what to listen to and what is a fuzzy analogy?

DR. BOYD

- You bring up an interesting point. The application you are talking about is a good one and one I have thought about doing but never have. Another black box we deal with is how much we spend on the military. For instance, if we talked about our daily fuel bill in Afghanistan in terms of what else we could buy with that money it would be a powerful communications device. I think using analogies is a really good strategy and one we do not do enough.
- In terms of when to trust an economist, I think you can test them and see how they react. Generally, I would shy away from those that appear more confident in their answer. In the presentation, we discussed how many valuation studies are incomplete and economists know this. The more comfortable an economist is with you asking questions and poking him/her indicates to me that they are more trustworthy. If however, they react in a defensive way, I would not trust the valuation.

Question 3

What are your thoughts or opinions on the Natural Capital Project InVEST?

DR. BOYD

- First off, it is important to emphasize that InVEST is developing tools that are meant to be used. They are more involved in the biophysical element than actual valuation and they are creating the foundation on which valuation is built. They have various levels in development: a water quality module, a carbon module, etc. They have a nice tiered mindset. Tier 1 would not satisfy the scientist, but it is good to discuss with the public. Tiers 2 and 3 are more nuanced and technical.
- One thing I would say is that we need to be extremely sympathetic to their challenge. They are working in a data poor environments and they are trying to create a set of tools that will be broadly applicable. All in all, I would like to give them a hug to thank them for what they are doing.

Question 4

In your chapter, you talk about two themes: 1) the difficulty in measuring resilience and 2) the importance of ecological endpoints. Could you not also say that some ecological endpoints act as indicators of resilience?

DR. BOYD

- The endpoint idea is to get the ecology and economics to synchronize together. Imagine being an economist and you have to figure out what the ecological outcomes actually mean and describe it in a way that makes sense to the public. I call it the neighbor test. If you talk to your neighbor about improvements in water salinity, will they know what you are talking about? Probably not. You still have to translate those things that we measure into outcomes your neighbor will understand. People tend to understand abundance and the availability of water, i.e., can I go swimming and not get a rash?
- A dark secret of interdisciplinary work is that if you cannot make that connection, you cannot pass the baton very well (e.g., the social scientists must attempt to make the connections themselves). The end point idea is to find a way to do this properly and push the ecologists and economists to get as close to something your neighbor can understand as possible. In the last couple of years, I have been working with a couple of ecologists trying to do this. I am working with the U.S. Environmental Protection Agency (EPA) to examine what we currently monitor to see what social and economic inferences can be made from what information we already have. We are also asking what else we would have to measure to get this sort of information.
- Resilience is a function of connections on an aggregate scale not just little pieces we destroy or degrade. We cannot get caught in micro data; we need macro data and need to plan for this. How do we create resilience given that all this change is coming from climate and demographic pressures? Again, this is the future direction.
- In economics, resilience has its own definition. There are a lot of core commonalities between economics and ecology in this regard and again, it is a place where economics and ecology can really work together.

PARTICIPANT

- It seems that there is an assumption that economists have a way to look at the whole and ecologists are looking at the pieces. We should take care not to think of fiscal and ecological disciplines. The two should evolve together to become more nuanced and complex.

DR. BOYD

- That is a really good point. The National Center for Ecological Analysis and Synthesis (NCEAS), at U.C. Santa Barbara, was created to do what you just mentioned. There is going to be a new synthesis center that will focus on bridging the social and natural component in Annapolis, Maryland. Resources for the Future (RFF) and I are involved in getting it going. The National Science Foundation (NSF) is participating in this too, so it is at that level.

Question 5

Talking about benefit indicators, I focus on cultural ecosystem services and would like to know what you think about those values that it is tough to put a number on? How do you address that? Do you count the number of people who feel connected to the wetland? Or is there a value for spiritual connection?

DR. BOYD

- I think there is a role for valuing cultural services but you need to be careful that you do not go too far. If you can show that there is a community and identify that the community is spiritually connected to a particular site, then it could be helpful to say there are a thousand of such people. You could then use the total number of people as your valuation.
- I would not go further than that and say how spiritually important the wetland is. Then you can get into trouble. But yes, it is important to remind people that places hold spiritual significance and there are X amount of people who have this connection.
- Also interesting to think about the "awe" aspect. One could work with a psychologist to determine what triggers "awe" to figure out if it can be quantified. For example, depth of field could be a factor that creates "awe." Perhaps the bigger the viewshed leads to a bigger depth of field that leads to a greater experience. This may be one crude way to compare Illinois to Wyoming. Then can calculate visitation, i.e. how many people see and experience that "awe." I know I am grasping here a little bit.

Question 6

Can you give a few examples in the United States where there is demand for this kind of information? How comfortable are you with supplying this type of data?

DR. BOYD

- There is a lot of demand for this kind of information but the lack of high quality data is a part of the issue. You need teams to work on this sort of thing. One of the fallacies is that you can bring in one economist and they can package up all the information how you need it. The problem is that you need an ecologist and an economist working together. Usually the needs are place-based and stakeholders will be involved as well. This is what is holding us back.
- We can talk about the Catskills example, but a lot of things fell in to place for that to happen and be successful. We are all strapped for budgets and for time. Depending on what you are looking for, i.e. if you want something scientifically credible, it is hard to pull off in a cost effective and quick way.
- It does take investment. The U.S. Geological Survey (USGS) for example has created a new office and they have hired an environmental economist. The Nature Conservancy (TNC) has hired an environmental economist. Often one person is hired and they are asked to weigh in on a bunch of stuff. We are contrasting with biophysical, social, and economic aspects of things. Getting real numbers is the hurdle right now.

Question 7

In Heal's paper ("Valuing Ecosystem Services." Ecosystems 3:1 (Jan.-Feb., 2000): 24-30.) he seems to argue that economics must provide the institutions with a method. Can you speak to that?

DR. BOYD

- He is making a really important point. For many people and organizations, the way you should think about price is as the carrot or stick to changing behavior. Again, the farm bill, we will pay $X per acre if they implement crop rotation or participate in activities that preserve nutrients in the soil. That price or incentive is not the value of what we get from those particular actions, it is just the behavioral tool used to get the change. Do you need the actual value? No.
- Heal is making the point that price in economics is about making behavior change in the way you want it.

Question 8

Did this lecture make you more comfortable with economic valuation of ecosystem services or less? Why?

PARTICIPANT

- The monetization makes me uncomfortable for many situations, but potentially quantifying does not.

PARTICIPANT

- I am struggling with this theme of monetization and non-monetization. I spent 6 years working on the Colorado River ecosystem and we had to work with the Native American valuation of that resource versus that of ecologists. I am not sure monetizing or not monetizing gets you past the challenge of comparing the resource value to have a discussion. Ecologists would describe the health of the landscape in ecologic terms while the Native American elders would give us a value without telling us why. In the end, we could not get them to have a discussion together and we were always in a stalemate. We need to have a common currency so we are able to examine tradeoffs. I think non-monetization is a cop-out because we need to get to a common currency.

PARTICIPANT

- There is a problem with the service provider and service recipient framework. Some cultures do not think in these terms so it is quite difficult to interpret valuation is this way. Even attempting to may be offensive to some people. Some cultures have kinship relationship and I am at a loss as to how to value that. How do you work with that?

PARTICIPANT

- I have been struggling with these questions for years; it is really an existential problem. As conservation economists, we have to play both sides because the science does not get us there, not even close. In the ideal world, you get things into the right currency and can perform a cost-benefit analysis. This is a systemic challenge and I am conflicted.

PARTICIPANT

- The decisions are being made. By not assigning a value, the system will implicitly value it at zero, which is much worse.

PARTICIPANT:

- I have a background in economics and I am in the process of using it for a policy valuation. I am frustrated because economic valuation is one tool. A colleague of mine said it best when he reminded me that no one marched on Washington D.C. because of a number. Valuation can help evaluate tradeoffs but it depends on what you are trying to accomplish.

PARTICIPANT

- I do not know if I am more or less comfortable with it. I spend a lot of time thinking with economists and working with engineers. What I find interesting is coming up with a nontraditional mechanism.

Question 9

One thing you said is that there is a great appetite and a willingness to undertake this work in federal agencies and in corporate settings. What we did not get from you is a tidy package or set of references for where to turn in our specific areas. Just speaking from a philanthropic point of view, where do critical things need to be developed for which government is not willing to pay? Or do you not have an answer?

DR. BOYD

- This answer is not going to do that question justice. In a generic sense, the thing that does not occur enough is cross-collaboration. Scientists are in their own world: the EPA has 300 ecologists in their office and they are all by themselves. Another example: I have held workshops and tried to motivate those scientists to talk to people in program offices with decision-making authority, but it does not happen. And it is the most obvious thing in the world to do.
- Point 1 is to facilitate and to get the science agendas to be sensitive to, motivated by, and in constant conversation with the users who can make changes on the ground. Again, it sounds obvious but it does not happen.
- Another thing that inevitably follows from that is working through the philosophical and language complications so we all understand what the focus is and work together. Have to do interdisciplinary studies along with cultural building to foster collaborative work.
- Another thing I would say is that government is not particularly well set–up to start working with ecosystem services valuation. Government rarely focuses at the right scale for ecosystem services valuation. We need more Catskill watersheds and the kind of focus that demonstrate how all these things come together. Getting to the right scale has been a problem and is an area with which philanthropic organizations can help.

- Economists need help moving away from the obsession of being published. This is what 99% of my colleagues care about. Economists should be worried about the quantity or quality that is changing, but it is really all over the map. As economists, we need to clarify and make it more consistent.

Question 10

How much impact can the ecosystem services movement have without explicit social valuation? Without dollar-based outcomes?

DR. BOYD

- Let me try to explain the question. As an economist, I see development within academic ecology/ natural sciences like the Natural Capital Project/InVEST–it is responsive and much more managerial and interactive; this is not just science for scientists. I wanted to trigger some discussion on whether what is happening in ecology is important just on its own.

PARTICIPANT

- One very interesting thing I have noticed today is how many different audiences we have come up with and the needs and frames of reference of those audiences. Also, there are various uses for ecosystem services. Some user groups I have noticed include popular media, corporate industry, policy makers, community members, and NGOs. Some of these groups will prefer monetary valuation while others will prefer more qualitative valuation. It is the classic economist answer: "it depends."

PARTICIPANT

- It gives you the opportunity to be adaptive.

PARTICIPANT

- We are narrowing the economist and end-user definitions. Defining what you really want might be more valuable. Maybe at the household level and then see the commonality.

DR. BOYD

- Another thing that was in the back of my mind in this question: I opened Newsweek or Time magazine shortly after Hurricane Katrina and there was an incredible picture and description on how wetlands buffer storm surges. First, there was action at a distance and then there was a lot of learning about biophysical cause and effect. I see our culture learning a lot. Our culture is learning a lot about climate change too. The fuel we burn here is affecting Madagascar. We are seeing systems that are connected in a way we have not seen before and that in itself has real value.

PARTICIPANT

- We have talked about local context and why it is important, but we have also talked a great deal about increasing scale. How do you reconcile that?

DR. BOYD

- I know many valuations are place-based but we do not have enough people; we are already being pulled in many different directions and the money is too thin. There is too much demand and we do not have incentives. When I say scale, I mean scale in terms of getting all parts working together as opposed to a large geographic scale.

PARTICIPANT

- I agree. There are not enough people or bodies working to get this together. There is cool funding available. For example, there are funding programs to support PhDs and masters programs for students from developing countries. This is a good example of how to scale up impact.

PARTICIPANT

- Do you need to put a value on social values or will that just come through via the stakeholder process? Everyone comes to the table with skepticism, but it still goes through the process.

DR. BOYD

- It can come through in the stakeholder process and you do not have to get the experts to do it. Getting stakeholders involved will create more buy in etc., but it can be expensive too.

PARTICIPANT

- Most planning and decision processes were developed before we got to this knowledge base. Now when you have a company in business for 50 or 100 years, we cannot give the same discount rates. For instance, the marine space used to be treated by businesses and governments as a frontier. Now we are looking for new emerging uses in a limited space. We have new tools but we are still stuck in old decision-making processes.

DR. BOYD

- I painted this positive picture. Let us talk about government first. Even if you look at our laws, they pretty much permit if do not actually explicitly call for ecosystem service valuation. It is hard to argue with this paradigm. Our laws are about replacing things that we value that have been destroyed. At that level, we are not thinking outside the box. Tort System. JB Ruhl has written a book, The Law and Policy of Ecosystem Services, about how this has started to play out in court cases. It is not the law that is the barrier; it is actually how you come up with damages and awards. Furthermore, departments are overwhelmed everywhere. Department of Defense, Department of Transportation, they are all interested in this. They want to calculate their dependence on water resources and their footprint. That is a positive spin.
- Having said that, ecosystem services do bring up our highly fragmented jurisdictional approach to the environment. Ecosystem services require that you cross boundaries. We have a project, a fabulous success story, in which Leonard Shabman and I were working with World Wildlife Fund to create a payment for ecosystems program in Florida to get ranchers to store water on their land so that Lake Okeechobee would not overflow and therefore stay relatively healthy. The problem was that the federal agencies were not very cooperative; they slowed the program and the program had to deal with each element separately. We need to work on how we integrate and manage jurisdictions.

PARTICIPANT

- Yeah you touched on it: most of our decision-making is piece meal. It is important to get the language right to get people to talk about the same thing. We are facing this everywhere.

DR. BOYD

- Other countries do a much better job; Britain has a planning culture we do not have.

PARTICIPANT

- There is already a challenge to think about bringing ecology and economics together in a meaningful way. There are many ways to get at valuation and non-monetization. What about polling people in a stakeholder process? It is possible to poll them pre and post to understand their knowledge so we can actually document the change from point A to point B.
- The Catskills example gets used repeatedly and it would be great to have another holistic example that engages all people and agencies to cookbook the process and document it in a valuable way.

PARTICIPANT

- On getting to a shared language, the mental gymnastics themselves can have an impact. Just by asking the questions, you might create a new form of thought. Some resist it but some jump on board and then frame thoughts in that way.

PARTICIPANT

- If you were to ask a question in a survey, what would you ask?

DR. BOYD

- We all know how horrible the “ecosystem services” language is. “Ecological wealth” might be slightly better but even this is poor. Basically, you want to know how people actually perceive their environment and how they perceive and interact with nature. The way to do it might be to look at activities and try to deduce the relationship that way. It is a deep question. Scientists who deal with this are all over the place.

PARTICIPANT

- So now, I wonder if we should ask people at all. Government makes decisions and we provide a proxy but we are never really asked if we like how much we spend on healthcare, or on defense etc. We elect people to represent us, but we are never directly asked, so maybe we do not need to ask for environmental valuation.
- One thing I am starting to recognize is that if we are really going to take this ecosystem services concept to heart, we are going to have to change ourselves. We will have to move from a conservationist view (which has really been a preservationist view) to a sustainability view. We maybe need to tell the sustainability story in this frame.