

Strawman Questions

Lyndsey Battle radio show on KHUM 2/4/17 Noon

What is a fact?

- A magazine published in the UK? [https://en.wikipedia.org/wiki/Fact_\(UK_magazine\)](https://en.wikipedia.org/wiki/Fact_(UK_magazine))
- A rock band from Japan? [https://en.wikipedia.org/wiki/Fact_\(band\)](https://en.wikipedia.org/wiki/Fact_(band))
- An album released by the Japanese band Fact? [https://en.wikipedia.org/wiki/Fact_\(album\)](https://en.wikipedia.org/wiki/Fact_(album))
- A fact is an idea which is considered to be wholly and absolutely true.
<https://en.wikipedia.org/wiki/Fact>

How can we decipher facts from “alternative facts?”

- Scientific Method?
 - What do we want? Evidence based science
 - When do we want it? After peer review
- What does the peer review process look like?

How does culture shape science?

In a broadly stroking nutshell, culture is a broad range of things that relates people to their existence and their belief systems. So, in that sense, changes in our belief systems have affected how science is practiced and how people believe in science. In times past, people based their beliefs mostly on religious principles put forth by some religious authority. Through centuries of struggle, science responded to this by developing and forming based on a belief that there is a natural-systems-explanation for all observable phenomena.

How does science shape policy?

Policy is often based on the rule of law and how organizations want to implement those laws. So, policy is often in the realm of the attorney at law and how actions using these policies satisfy the laws. Often science is used by law makers when they write bills to be considered.

Some policies are based more on how best to accomplish a certain task. For example, managing rivers to reduce flood hazards or protecting public land for recreation value.

Science can inform both legal and other policy development. For example,

1. Studying river flows for decades to centuries gives us the facts with which to define flood hazard zones.
 - a) Affects county building codes (policy)
 - b) Affects insurance rates (side effect)
2. USGS National Seismic Hazard Map is based upon 2 & 3
 - a) Affects county building codes (policy)
 - b) Affects insurance rates (side effect)
 - Studying earthquake recurrence of the past to help inform us of the likelihood of a future earthquake
 - Studying how subduction zone faults slip and how that might affect
 - a) ground shaking
 - b) landslides
 - c) tsunami

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Example of Local Policy influenced by facts:

- Dissect policy to facts
 - Replace facts w/alt-facts
 - Rebuild policy with alt facts and talk about how they differ?
 - What is the potential impact on society of new alt-fact based policy?
1. **Fact Based Policy: Tsunami Evacuation Zones** (very generally)

Step 1: develop numerical model for tsunami inundation

Step 2: for evacuation zones, extend inundation limits to easy to identify geographic features

- i.e. easier to identify a road than a position out in a cow pasture with no landmarks

Step 3: prepare maps and place signs

Step 4: develop county/city/community response plans and community evacuation routes

Step 5: rehearse these plans and have tsunami drills

2. **Alt-Fact Based Policy: Building in the Flood Zone**

- FEMA Flood Zones are based upon:
 - scientific analyses of river flows and
 - statistical estimates of likelihood (probabilities)
 - numerical modeling of river flows
- Imagine adopting alt-facts that suggest floods would be different than FEMA Flood Hazard Maps.
- Change county development policy (e.g. General Plan Update or other modification)
- Build large residential development in flood plain prior to a major flood. The flood destroys some percent of the development. Alt-Fact policy can be expensive.

Can we talk about the idea of arguing (or creating policy) from evidence vs. ideology?

- In my opinion, are evidence based facts powerful enough tools to counter an approach of irrational bombardment?
 - This is a very interesting question. There are some varying opinions on this.
 - Atul Gawande (New Yorker, 2016) suggests avoid arguing with people about their skewed views, but to help them develop their own critical skills. e.g. "Rebutting bad science may not be effective, but asserting the true facts of good science is. And including the narrative that explains them is even better."
 - If I focus on the facts instead of bashing the Alt-Facts, I am probably more successful. Of course, I am not perfect at this. Sometimes I do spend time trying to help someone change their mind.
- How do we better ground ourselves in a reality based on facts in a world where it becoming hard to recognize facts based from science?
 - This is very challenging. It takes time to evaluate information and sometimes it requires a certain level of expertise. For example, it takes a hydrologist and an engineer to estimate what the flood hazards would be for a certain region.

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- If we are not experts, we need to develop some other way to evaluate the credibility of a source of information. This is a somewhat indirect way to assess how factual something is. Everyone should develop their own rules. Here are some that I have developed for evaluating an article online or in a journal, in no particular order (there are other lists online elsewhere).
 1. References – what are the sources of information? Are these from peer reviewed literature? Are there lots of references (like a meta-analysis like the IPCC Assessment Reports)? Does the article only refer to other articles with the same URL (web address) as the main article? (climate change denier websites do this, as do websites for extremist organizations)
 2. Contrasting Views – are there alternate hypotheses discussed?
 3. Publisher – is the article published by a peer review journal publisher (like Elsevier, Nature, Science, etc.)? Is the article from a newspaper that has an editorial board? Newspapers have a lower credibility than a peer review journal, but more credibility than an op-ed in the same newspaper. Is the article in a blog? Blogs can be OK, but they generally don't have the same level of review as other sources. Blogs can be terrible sources of information too.
 4. Primary Source – is the article the primary source for this information or does the entire article exist as an article from some other publisher. The primary source of the article is the most credible. Beware of articles that are copied word-for-word between different websites. This is a strategy to artificially increase the apparent credibility of an article. I initially noticed this strategy on early climate change denier websites.

Maybe sliding these ideas in between the science shaping policy and culture shaping science questions? Or local policy example and science shaping policy question:

1. Are science based facts influential only in policies created within certain areas of government commonly attributed to science (agriculture, education, energy, health & Human Services – for example) or can we also attribute science-based facts as influential in developing policies related to social issues (policies that deal with ambiguity)?
2. Talking about the idea that nothing in the future is a fact...
 - Climate change: direct result of human activity or part of the Earth's cycle?
 - Maybe relation of science to predict future to the Cascadia subduction zone?
 - The use of statistics, probability, correlation, and how it relates to fact.