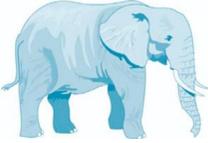
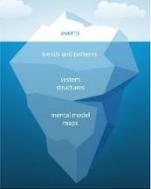
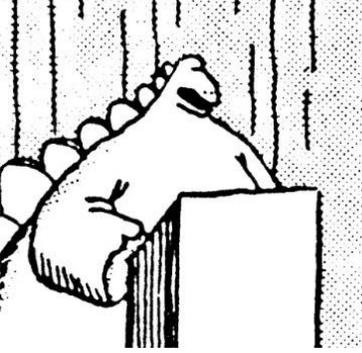
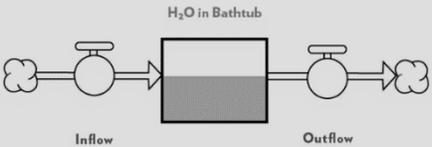


WHERE WE ARE

- We agreed during class that we will finalize the groups for the Activity assignment today, October 31, 2022. If you want to work solo you can.

QUICK REVIEW

 <p>A system is likely to be “seen” differently by different stakeholders.</p>	 <p>A system has a structure below of beyond what is apparent.</p>	 <p>The structure of a system has behaviors that are derived from the structure.</p>
 <p>Derived from Gary Larson cartoon published in 1985.</p>	 <p>FIGURE 4.9 THE BATHTUB ANALOGY. The Bathtub Analogy highlights the importance of understanding stocks and flows when analyzing system behavior. Innovation Associates Organizational Learning</p>	

Bounded Rationality (Herbert Simon)

<https://apothegms.wordpress.com/cartoon-dinosaur-and-we-have-a-brain-the-size-of-a-walnut/>

“The picture’s pretty bleak, gentlemen. ... The world’s climates are changing, the mammals are taking over, and we all have a grain about the size of a walnut.”

These notes are based on chapters 4 through 7 in our textbook, and also some information about stocks and flows from another book.

I am a little confused about the organization in the textbook at this point. It seems to me that “facing the current reality” (chapter 8) should come before “making the explicit choice,” chapter 7.

It seems to me that Stroh's "four step plan" should be along these lines.

Identify the social problem you would like to correct, while realizing that it may only be a symptom of a larger situation (system).

Elicit and listen carefully to the "stories" of the various stakeholders as they offer different perspectives on the problem. Listen for the possible system ELEMENTS in their stories.

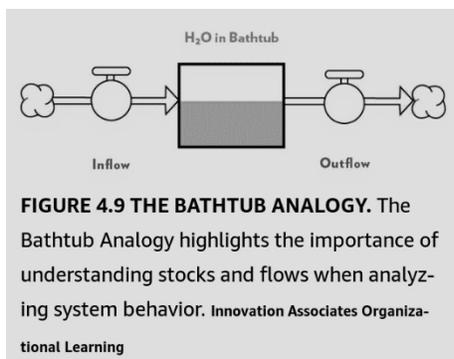
Try to get a handle on the scope and boundaries of the relevant system. Don't go too far because there are limits to what can be done. But look for ROOT CAUSES and consider the limits of the relevant political jurisdiction.

Once you identify the major reinforcing loops, you can begin looking for balancing loops in the CURRENT REALITY. Then you can begin looking for LEVERAGE POINTS by which to enact policies intended to move from the current reality to the DESIRED STATE of things.

We may not be able to directly address the "bath tub" but we may be able to modify a flow (people behaviors) slowly over time. In other words, we can LET THE DELAY in the system work FOR us rather than against us. But we have to be PATIENT and the system has to be stable enough to give this approach TIME TO WORK. It is kind of like medicine. A tiny prescription pill taken regularly over time can make a big difference in our health.

So far we have . . .

the elephant story
the image of an iceberg
the toy slinky
and now, the bathtub analogy



Source: Stroh textbook, chapter 4

The other name for the bathtub analogy is "stocks and flows."

(See the book "Thinking in Systems" by Donella Meadows.)

This idea is not difficult but it is abstract. A FLOW moves and a STOCK accumulates. When there is DELAY in a LOOP, whatever is moving is likely to accumulate a STOCK.

It could be money, accumulating into an account.

It could be industrial emissions accumulating into acid rain clouds.

It could be microaggressions accumulating into resentment or anxiety.

It could be experiences accumulating into knowledge.

I bought a toy intending to use it to demonstrate stocks and flows.

I discovered it can be used to model reinforcing loops in which more of something is correlated with more of something else.

However, I don't think it is possible to model how more of something is correlated with LESS of something else, using a toy. Turning the valve down does not ultimately reverse the polarity of the loop. There are limits to any model or analogy. But models are thinking tools and can be valuable precisely because they are abstractions of reality.

THE MIT "BEER GAME" SIMULATION

<https://mitsloan.mit.edu/teaching-resources-library/mit-sloan-beer-game-online>

A small brewery is the sole source of "Lovers' Beer." There is a supply chain by which cases of Lovers' Beer is transported to warehouses and then (when ordered by retail stores) the cases are shipped to retail stores. There are no communications chains between the managers at the brewery and the managers of the retail stores. When the simulation is played by students and others, this usually happens.

As result of a popular music video that goes viral there is a sudden increase in retain customers buying and requesting to buy Lovers' Beer. Retail managers take note of this and place larger orders for the beer from the warehouses. The warehouses go empty and the warehouse manager places a large order of cases of the beer from the brewery. **THERE IS DELAY** in the system resulting in a **BACKLOG** of orders. When they do not get the cases they ordered, the retail managers panic and place larger orders. Their shelves are empty and customers want to buy the beer. **IN TIME**, the brewery is able to gear up production, but by the time it does the warehouse manager has placed even greater orders with the brewery. Everyone is stressed out. Large backorders accumulate through the entire system. When the brewery finally gets up to a high level of production, it floods the wholesaler with **MANY** cases of beer (to fulfill backorders) and the wholesaler in turn **FLOODS** the retailers to fulfill their backorders. Now the warehouse and the retail stores have high quantities of Lovers' Beer, far beyond the demand.

The **FLOW**, of course, is the movement of cases of beer from the brewery to the warehouse and from the warehouse to the retailers.

The **STOCKS**, are the accumulations of beer in the warehouse and in the retail stores.

This example regards a long SUPPLY CHAIN. This example fits into a course on LOGISTICS.

But it also fits here in a course on public policy. Consider, for example, how agencies often buy large amounts of supplies at the end of a budget year in order to spend money to spend out the budget. Consider how people buy excessive amounts of water and paper products prior to a storm. With existing systems (current realities) these kinds of behaviors can be RATIONAL in the perspectives of individual actors.

The question becomes, can public policies be used to ALIGN the perceived rational interests of people with the good of the COLLECTIVE group? In other words, what is the STRUCTURE of the system that we may be able to address to affect BEHAVIOURS for the common good?

Can we get our heads around the current reality? Do our political systems allow us to address our social problems? Can we work around our BOUNDED RATIONALITIES and our POLITICAL RATIONALITIES?