

PFAS towards 2029: Priorities for Action, An Interactive Session

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Acknowledgement of land

I would like to acknowledge that the land on which we meet is the traditional territory of the Ute, Cheyenne, and Arapaho Peoples and pay my respect to Elders past, present, and future, and those who have stewarded this land throughout generations.

You will need a cell phone with data

- This panel will elicit audience responses via an online form.
 - Take a minute to ensure you have a data connection.
 - If you have cell reception please use that and save the wifi for those who don't
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- SSID: battelle2024
 - Password: chlorconf24

Agenda

- Explanation of the pre-mortem process
- Audience responses – 3-5 minutes
- Living with PFAS – 10 minute presentation while the responses are processed by A.I. and prepared for voting
- Voting by audience – 3 minutes
- Panel discussion

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What is a Premortem?

- Prospective hindsight is imagining that an event has already occurred. It increases the ability to correctly identify reasons for future outcomes
- A premortem uses prospective hindsight to imagine that a project has failed in the future
- Experts then propose reasons for the failure
- Provides a counter to group-think
- Allows “left-field” or “impolitic” reasons to be provided
- Enables action to be taken now to prevent that future failure

Elicitation of Responses

1. Imagine that the management of PFAS has failed terribly in 5 years time. This will mean different things to different people.
2. Why did it fail? What are the reasons, causes, drivers?
3. Complete the online form. Provide up to 3 different reasons.
4. Be clear and concise. Shorthand and abbreviations are OK.
5. A.I. will be used to collate and aggregate the responses.

<https://bit.ly/3Vs7Ghx>

Battelle Denver 2024: PFAS Pre-Mortem Brainstorm for Panel Discussion



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A close-up photograph of a yellow flower, likely a daisy or similar, with a green, pointed bud at the bottom right. The petals are bright yellow and slightly blurred, while the bud is in sharper focus, showing fine details of its structure. The background is a soft, out-of-focus green.

Interlude – Living with PFAS

Living with PFAS

Andrew Mitchell
and
Matthew Askeland

2024 Chlorinated Conference
Thursday, 6th June 2024
Denver, Colorado



Flashback to PFAS Summit 2018 (Australia)

- It won't always be possible to fully remediate. Can there be such a thing as "living with PFAS"?
- How to make a difference that is measurable and meaningful?
- What is proportionate application of the precautionary principle?
- What is society's willingness to pay to address PFAS?
- What is a tolerable PFAS risk? Which uncertainties are acceptable?
- How to evaluate the practicability and proportionality of a response?
- How to shift from a problems focus to a solutions focus?



Where are we now?

PFAS detected in:

- 90% of paper straws, up to 29 ng/straw,
- Compostable takeaway containers 50 mg/kg total PFAS (TOPA)
- 74% of FDA-tested seafood samples
- 50% of European leaders (above the levels of concern)
- Rainwater, at times over 4 ng/L
- Eyedrops (100% perfluorohexyloctane)
- House dust Sum PFOS at 1.9 mg/kg Pre-TOPA!
- In stain resistant carpets (polymer - side chains).
- WWTP effluent 100 - 500 ng/L Sum PFAS (DiPAPs?)
- Widespread across ski resorts
- Most recycled organics (composts) ~1-10 ug/kg





Taking a step back

- PFAS is everywhere we look
- Nearly impossible to remove low levels from the environment
- Huge investment in remediation while pollution is ongoing
- Zero tolerance approaches are distorting the management of risk
- Push towards circularity can lead to perverse outcomes
- The public sector is bearing disproportionate costs



What can we do?

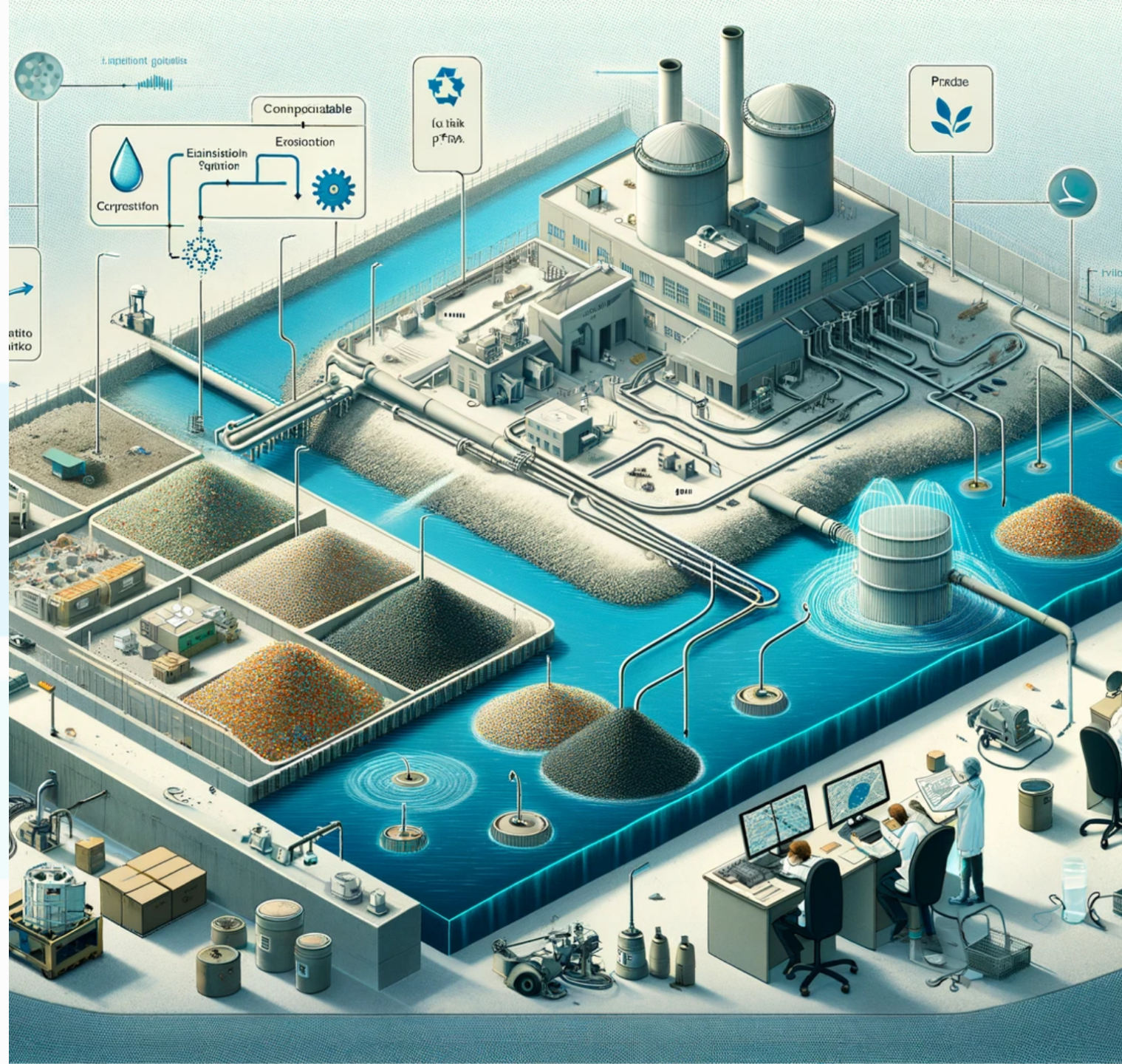
W Edwards Deming had it all worked out:

1. Identify the biggest problem
2. Manage/mitigate/remove/solve it
3. Measure the change
4. (Tell everyone)
5. Identify the next biggest problem
6. Continue until change is no longer measurable or meaningful

If it won't change anything, don't do anything!

Examples

- Nguyen et al (2022): 41% of PFAS load to WWTPs is from point sources v Thompson et al (2023)
 - Map the time-integrated PFAS inputs through the network
 - Use regulatory tools to control the point and diffuse sources
- APCO (2021): 28% of food packaging contains high PFAS
 - Evaluate and manage compost feed stocks
 - Government regulation of “compostable” marketing claims

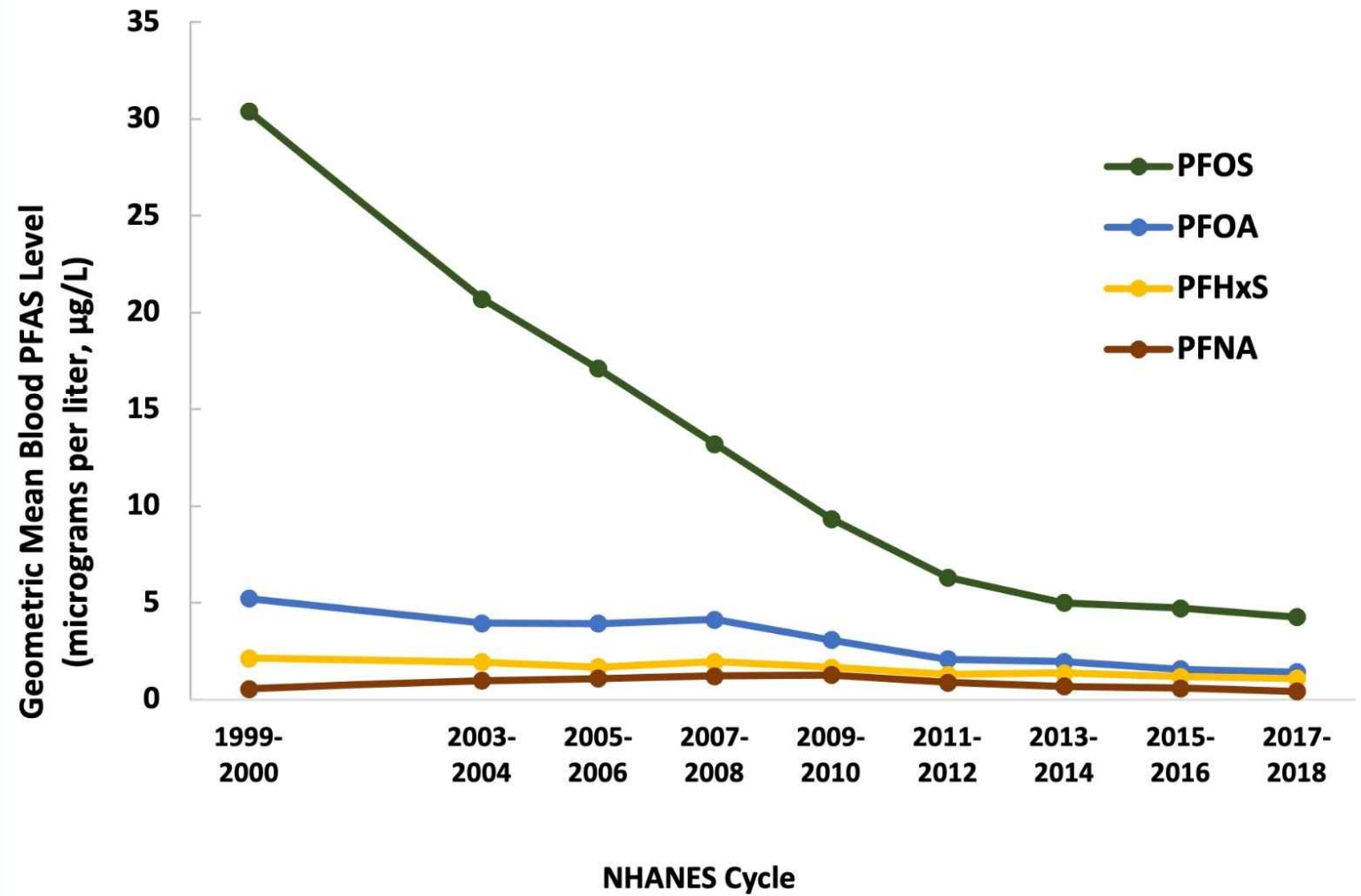




More examples

- Infrastructure project has detected PFAS and requires treatment
 - Site assessments to evaluate whether contamination is primary, secondary or ambient
 - Water assessment to ensure no “new” contamination
 - Comparison of treatment outcomes against baseline conditions
- PFAS found in recycled building materials
 - Regulation of inputs to recycling system rather than outputs
 - Recognition/validation of treatment technologies

The battle
can be won!



The cost of going too far

- End of pipe solutions are costly without much meaningful benefit
- Exemplary performers are bearing a disproportionate cost
- The circular economy is at risk
- Other contaminants are also important
- What amount of PFAS is tolerable?
- What is the net benefit of any action?





Back to the panel

Voting on reasons for future failure

- Which reasons are most important?
- Scroll through the online form
- Rate 1 star for not important and 5 stars for most important
- Try to allocate your ratings evenly across the spectrum

<https://bit.ly/4bS2bhR>

Battelle Denver 2024 - Harvard Pre-Mortem Response Voting



Battelle Denver 2024 - Harvard Pre-Mortem Response Voting



<https://bit.ly/4bS2bhR>



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Panel Discussion

- Panel introduction
- Foundation questions
- Move to audience responses when voting has been tallied (10 min)