Defining and Writing your Regional Research Problem

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Why developing a good research question is important… and time consuming

- You want to ensure that the project design, research methods and products address your identified need.
- You want to think through the details to understand the scope and ensure it’s feasible.
- You don’t want to duplicate existing information/data.

Your research question may have many parts

- What impact do X/Y/Z chemicals have on amphibians?
  - Objective: Provide data for developing risk assessment guidelines.
  - What impact do they have on successful reproduction and recruitment?
  - What impact do they have on survivorship?
- How much X/Y/Z chemical is found in specific locations?
  - Objective: Gather data for use in future risk assessments.

How do you make a good research question?

- Clear objectives
- Complex/extrapolatable enough to require research… but feasible
- Identify stakeholders/partners
- Clear, focused, and concise
- Check for assumptions
  - How much X is harmful?
  - How much X chemical is found in a specific location?
  - Is X/Y/Z associated with A/B/C impacts?

Finding a question

- What is something that is difficult to do or could be done better if more information was known?
  - What guidance would be helpful?
  - What data is missing?
- What currently exists? = **Gap!**
- What do you need?

Finding a quest

I don't have any information on how to evaluate Kryptonite in risk assessments.

- What is something that is difficult to do or could be done better if more information was known?

I only have guidance for similar materials.

- What currently exists?
- What do you need?

I need guidance on how to assess Kryptonite impacts on human and ecosystem health.

One study in Kansas found that it was alien and rare on Earth. Several states have identified the lack of information as a data gap.

- What information can you find about this data gap?
  - Is this data gap resolved elsewhere?
  - Is there a lack of data?
  - Have previous studies not asked/answered the right questions required for developing guidelines?

What is the impact of Kryptonite on human health and the environment?

Define initial objectives

- How do you want the research results to be used?
- What do you expect this research to find?
- Who do you expect will use the results of this research?
- What is the problem statement? Why is this study important?

For "someone" to develop a guideline on how to incorporate Kryptonite mine runoff in risk assessment.

That humans are having negative reactions after ingesting water with Kryptonite.

Kryptonite may be contributing to human health and environmental impacts.

My region, other regions, "someone" developing guidelines, EPA Offices (Water, Children's Health, etc.), states

Determine the relationship between Kryptonite in water and human health.

Provide the data/analysis to contribute to guideline development.

Convert your objectives into questions

Objectives

Determine the relationship between Kryptonite in water and human health.

Provide the data/analysis to contribute to guideline development.

Questions

What human health affects are associated with Kryptonite in drinking water?

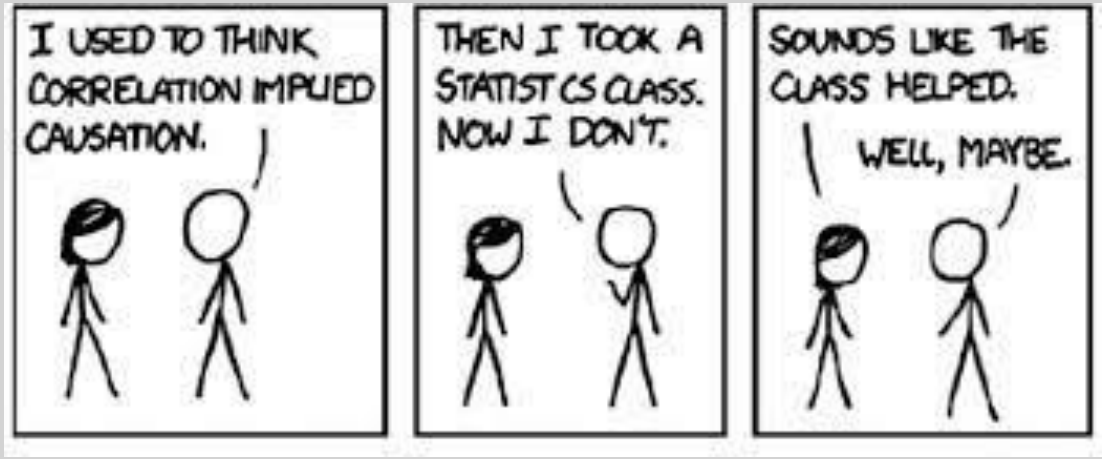
What is the relationship between Kryptonite levels in drinking water and human health effects?

Refining questions

- What information already exists?
- What are your study areas? (Where and when are you gathering data?)
- What are your response variables? (What are you measuring for effect?)
- What are your covariates? (What do you expect to influence your response variables?)
- What type of data collection methods are you considering?
  - Human surveys/interviews/focus groups
  - Field surveys
  - Lab experiments
  - Meta analysis/secondary data analysis
  - Mixed methods

What type of research are you doing?

- Descriptive- describe and/or summarize a situation or status
- Correlation- collect field data for response and covariates to evaluate relationships
- Experimental- strictly adheres to a research design



Identify and connect with stakeholders and partners

- Is your project relevant to coworkers, program offices, other regions, states, etc.?
- Connect
  - What related data/information would they like?
  - What suggestions do they have?
- Can you make your question broader to be applicable to other EPA offices/regions (or non-EPA organizations)?
  - Can you expand/generalize the study area?
  - When collecting data, can you collect more data?

Circle back-
Do your research questions meet your objectives?