



# Flooding and Water Level Monitoring



# What is flooding?

An overflowing of water onto land that is normally dry.

We monitor and describe flooding with water level data.

Water level – the vertical depth of water from a reference point.

Often referred to as gauge height or stage.

- NOT the depth of the water. It's the deviation from normal or mean if the area is tidal.



# Why do we monitor water levels?

- Flood mitigation land/habitat management
- Flood risk management
- Emergency action planning

## Water level

Averaged by day  
SMC-KERR-WL

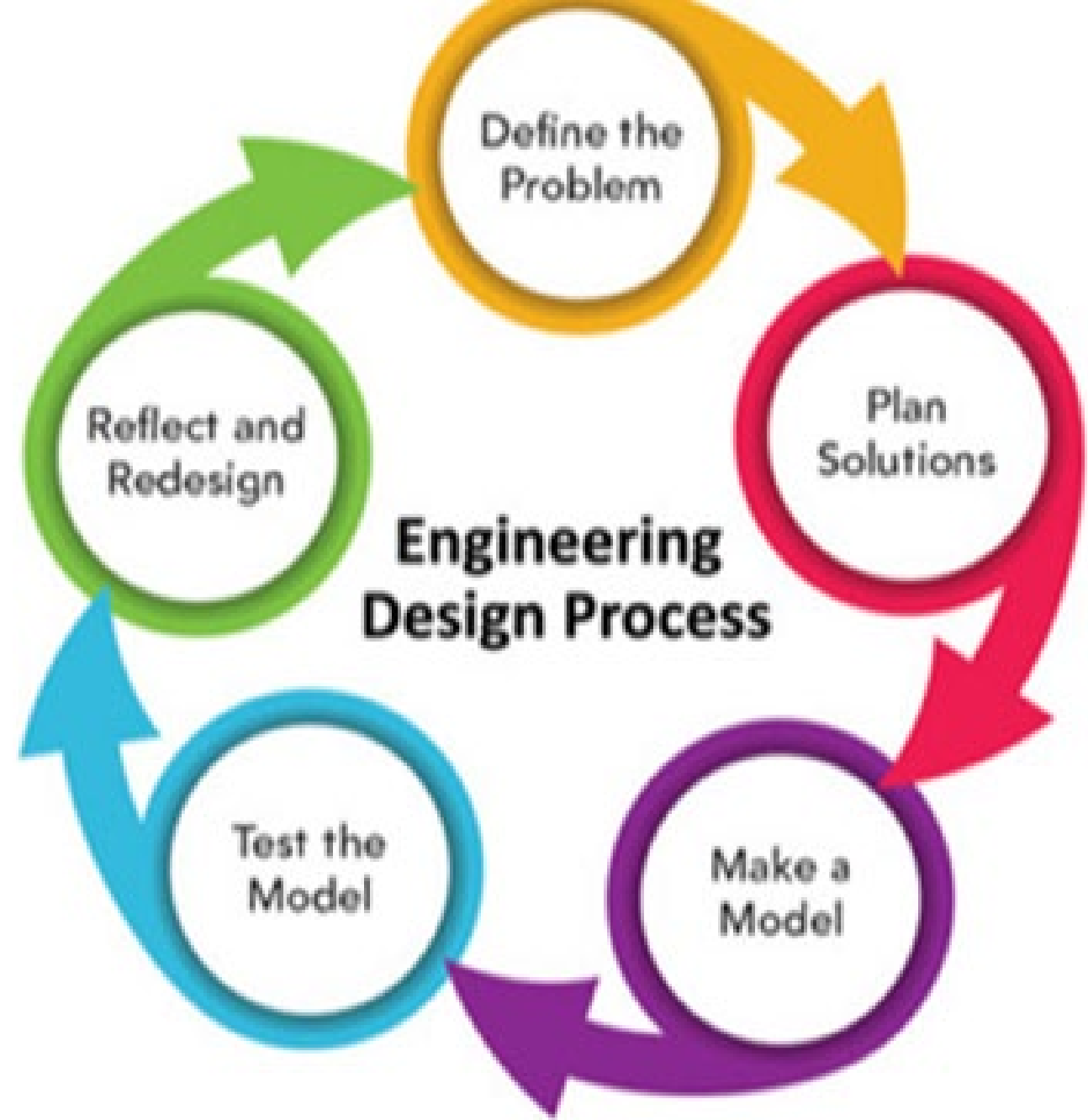




# The Engineering Cycle

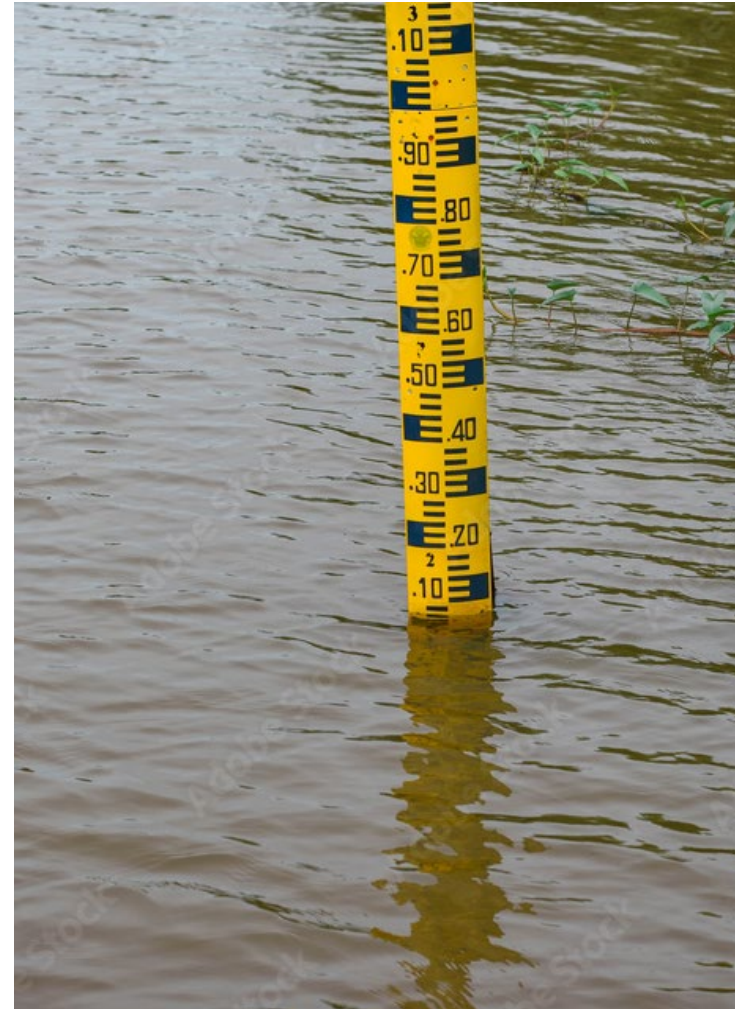
**Problem:** Notify communities when they need to be prepared for flooding impacts.

1. Brainstorm solutions and research what's already in existence
2. Make a model
3. Test



# Low-tech No-tech monitoring

Pros	Cons
<ul style="list-style-type: none"><li>- Low cost</li><li>- Easy installation</li></ul>	<ul style="list-style-type: none"><li>- Must monitor by viewing at regular intervals.</li></ul>



# Procedure

- 5 minute make a plan
- 10 minutes build
- Test
  - While you wait to test...
    - What are pros & cons of your design?
    - What would you do in a redesign?

Pros	Cons



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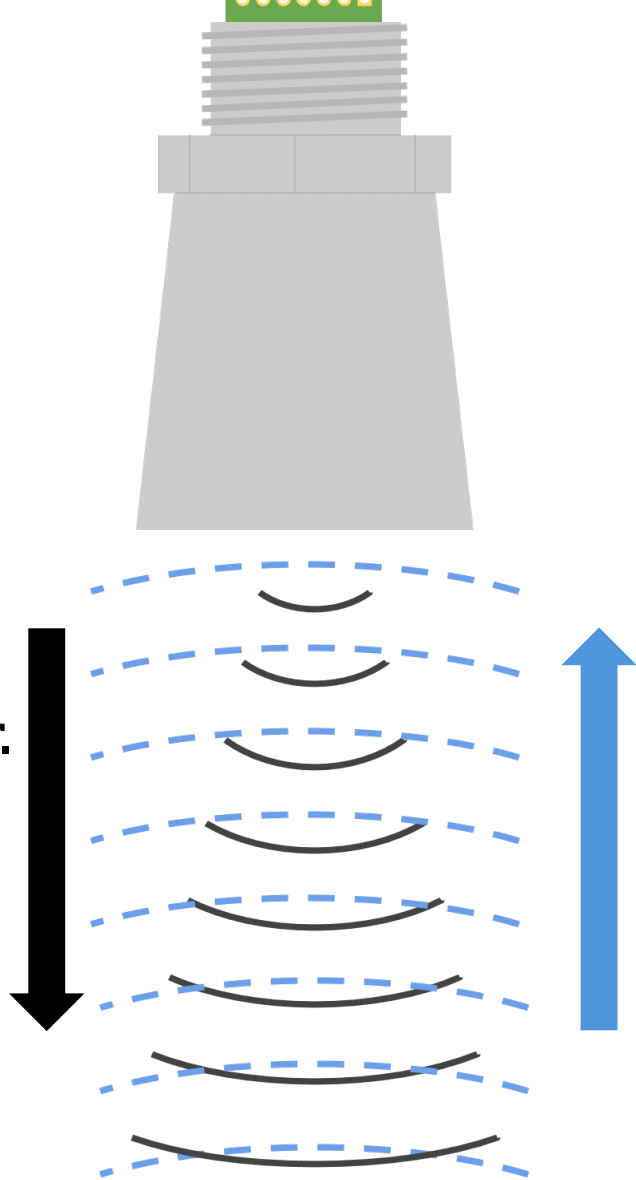
# USGS Crest Stage Guage

Pros	Cons
<ul style="list-style-type: none"><li>- Records the highest water level</li><li>- Don't have to be in the field to record the high.</li></ul>	<ul style="list-style-type: none"><li>- Must reset between each storm.</li><li>- Increased room for error.</li></ul>



## Step 1

The sensor sends down **sound waves** to the water.



## Step 2

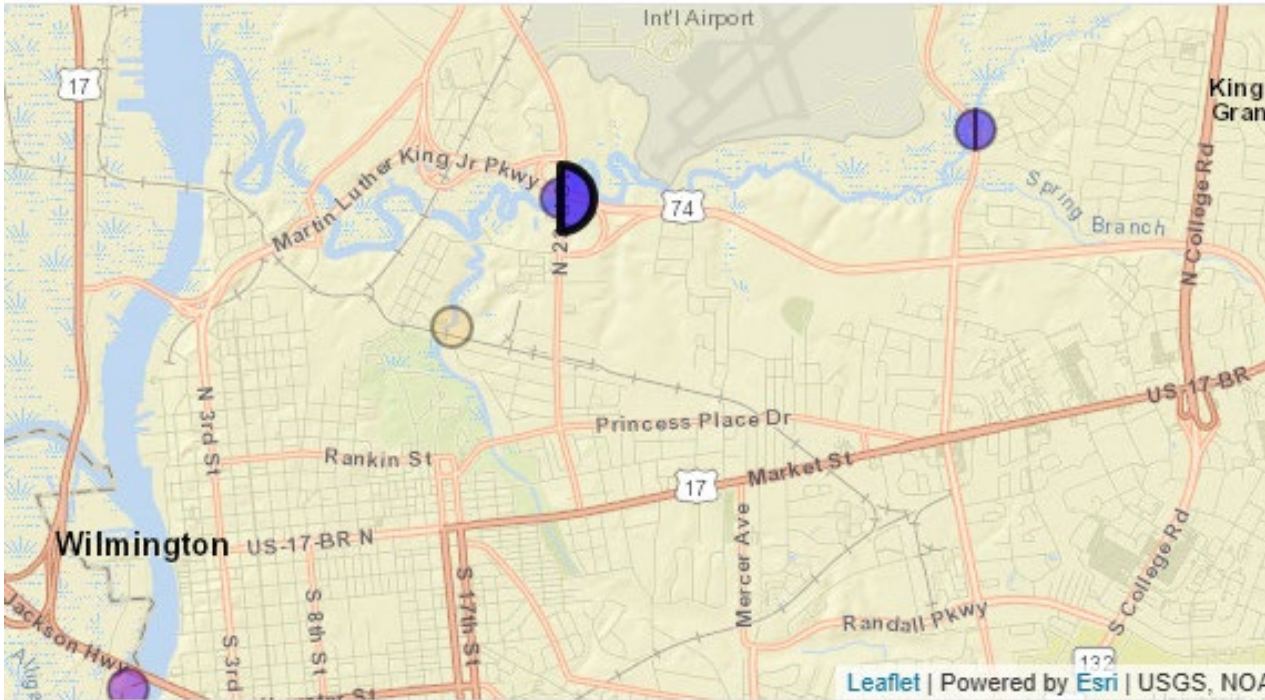
The sensor counts the **amount of time** it takes to receive those sound waves back.

## Step 3

We use **math** to determine the water level based on the time.



# What does the data look like?



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