DEPLOYMENT OF CONTINUOUS WATER QUALITY MONITORING EQUIPMENT: PRACTICAL CONSIDERATIONS

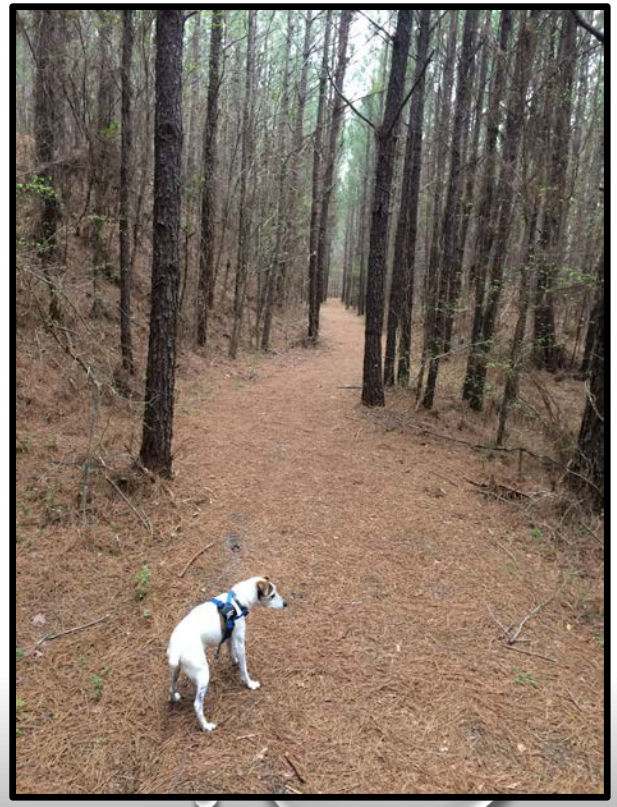
ALABAMA WATER RESOURCES CONFERENCE

SEPTEMBER 8, 2016

TTL

OUTLINE

- BACKGROUND, DEFINITIONS, DISCLAIMER
- IMPORTANT QUESTIONS
  - WHY, WHAT, WHERE, WHEN, HOW
- HYPOTHETICAL EXAMPLES
- LESSONS LEARNED



BACKGROUND

- HISTORICAL PERSPECTIVE
- EVOLUTION OF TECHNOLOGY
- DATA-DRIVEN DECISIONS
- THE AGE OF COMMUNICATION

DEFINITIONS

- CONTINUOUS
- REAL TIME
- WATER QUALITY
- DATA SONDE
- WATER QUALITY PARAMETERS
- DEPLOYMENT

DISCLAIMER

- REFERENCE IN THIS PRESENTATION TO ANY SPECIFIC COMMERCIAL PRODUCT, PROCESS, OR SERVICE, OR THE USE OF ANY TRADE, FIRM, OR CORPORATION NAME IS FOR GENERAL INFORMATIONAL PURPOSES ONLY AND DOES NOT CONSTITUTE AN ENDORSEMENT, RECOMMENDATION, OR CERTIFICATION OF ANY KIND BY TTL. PERSONS USING SUCH PRODUCTS ASSUME RESPONSIBILITY FOR THEIR USE IN ACCORDANCE WITH CURRENT DIRECTIONS OF THE MANUFACTURER.

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IMPORTANT QUESTIONS

- WHY?
  - ESTABLISH A CLEAR PURPOSE FOR COLLECTING THE DATA – WHAT QUESTION(S) WILL THE DATA BE USED TO ANSWER? WILL CONTINUOUS DATA COLLECTION ANSWER THE QUESTION(S) MORE EFFECTIVELY THAN DISCRETE MEASUREMENTS?

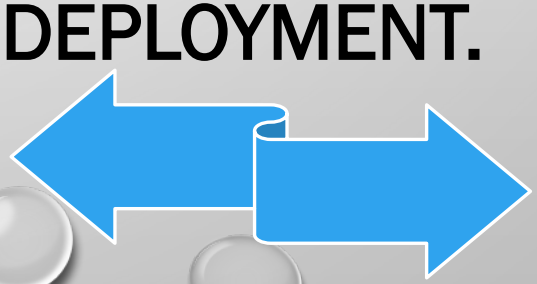
: FOR WHAT REASON OR PURPOSE

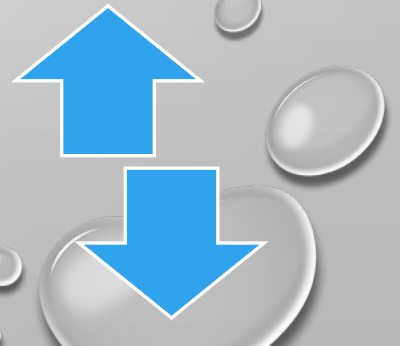
IMPORTANT QUESTIONS

- WHAT?
  - DETERMINE WHAT DATA ARE NECESSARY TO ANSWER THE QUESTION(S) AND FULFILL THE PURPOSE OF THE DATA COLLECTION EFFORT. IS IT POSSIBLE TO COLLECT THE NECESSARY DATA USING AVAILABLE CONTINUOUS MONITORING TECHNOLOGY?

IMPORTANT QUESTIONS

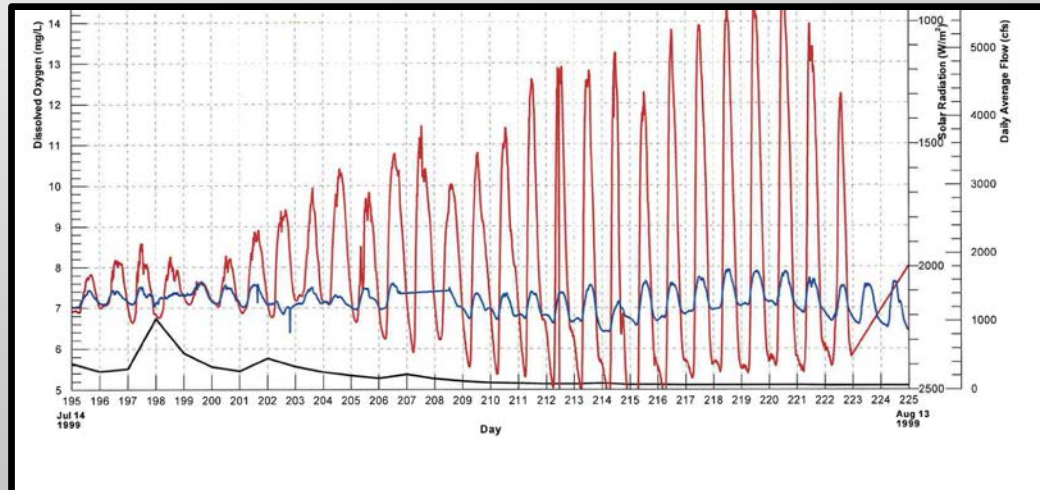
- WHERE?
  - SELECT THE MONITORING LOCATION WHICH BEST REPRESENTS THE WATERBODY OF INTEREST RELATIVE TO THE QUESTION(S) TO BE ANSWERED? CONSIDER ACCESS TO THE MONITORING LOCATION, LOCATION WITHIN THE WATERBODY (HORIZONTAL AND VERTICAL), SECURITY OF THE EQUIPMENT, AND DURATION OF DEPLOYMENT.





IMPORTANT QUESTIONS

- WHEN?
  - ESTABLISH BOTH THE DURATION OF THE MONITORING EFFORT AND THE MEASUREMENT FREQUENCY. CONSIDER DAILY AND SEASONAL VARIABILITY AND THE NEED FOR LONG-TERM DATA TO ESTABLISH TRENDS.



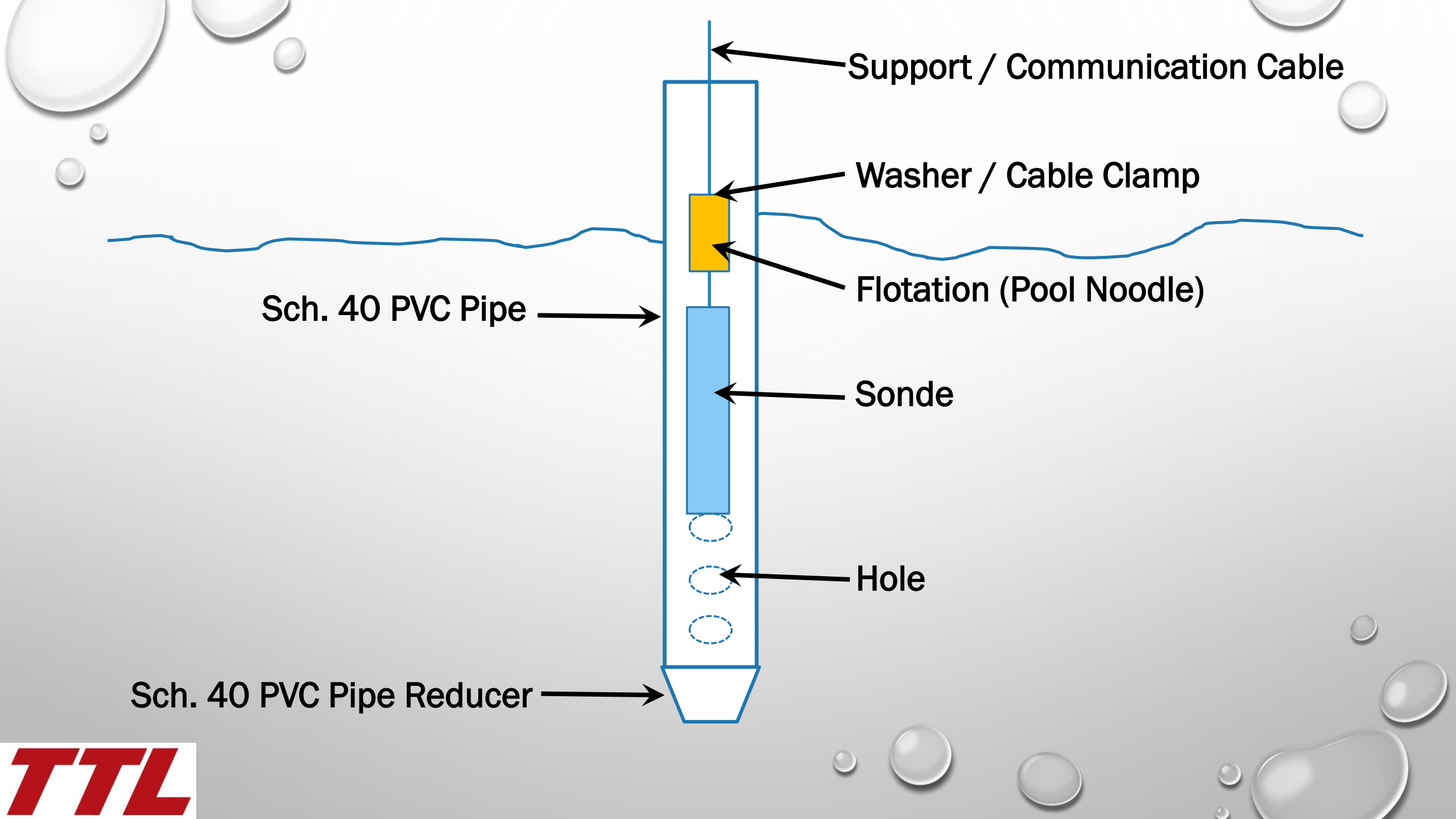
IMPORTANT QUESTIONS

- HOW?
  - SELECT MONITORING EQUIPMENT AND A DEPLOYMENT DESIGN BEST SUITED TO THE LOCATION AND QUESTION(S) TO BE ANSWERED BY THE DATA. CONSIDER COST, EQUIPMENT CAPABILITY, SITE ACCESS AND CONDITIONS, AND EQUIPMENT SECURITY.

HYPOTHETICAL EXAMPLE #1

HYPOTHETICAL EXAMPLE #1

PVC PIPE FITTINGS


Support / Communication Cable
Washer / Cable Clamp
Flotation (Pool Noodle)
Sch. 40 PVC Pipe
Sonde
Hole
Sch. 40 PVC Pipe Reducer

WATER QUALITY PARAMETERS

- WATER TEMPERATURE
- CONDUCTIVITY / SALINITY
- PH
- DISSOLVED OXYGEN
- WATER LEVEL
- TURBIDITY
- OTHERS ?

THINK ABOUT THIS

- ACCESS
- SAFETY
- EQUIPMENT SECURITY
- LIGHTNING
- POWER SUPPLY
- FOULING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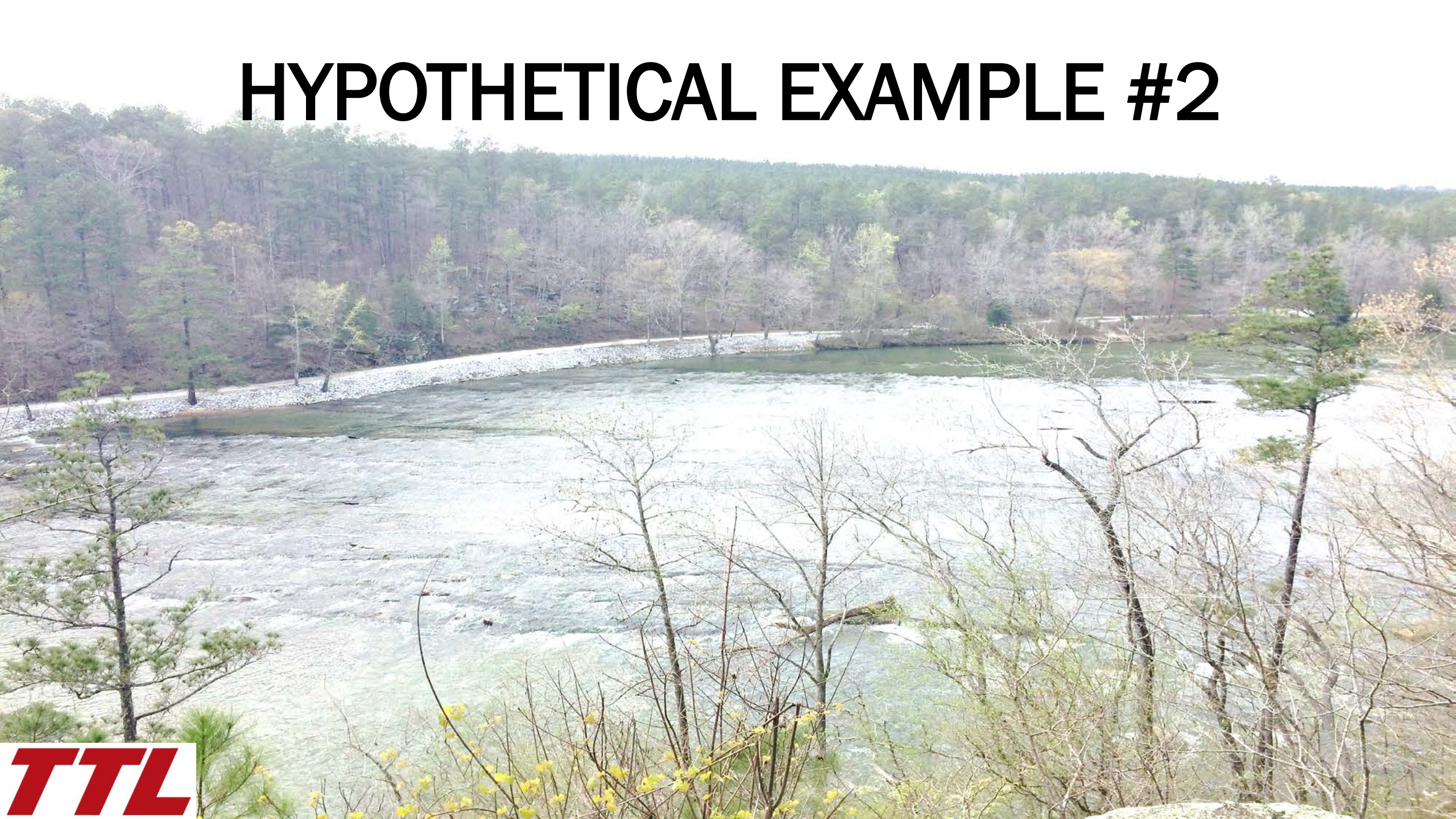
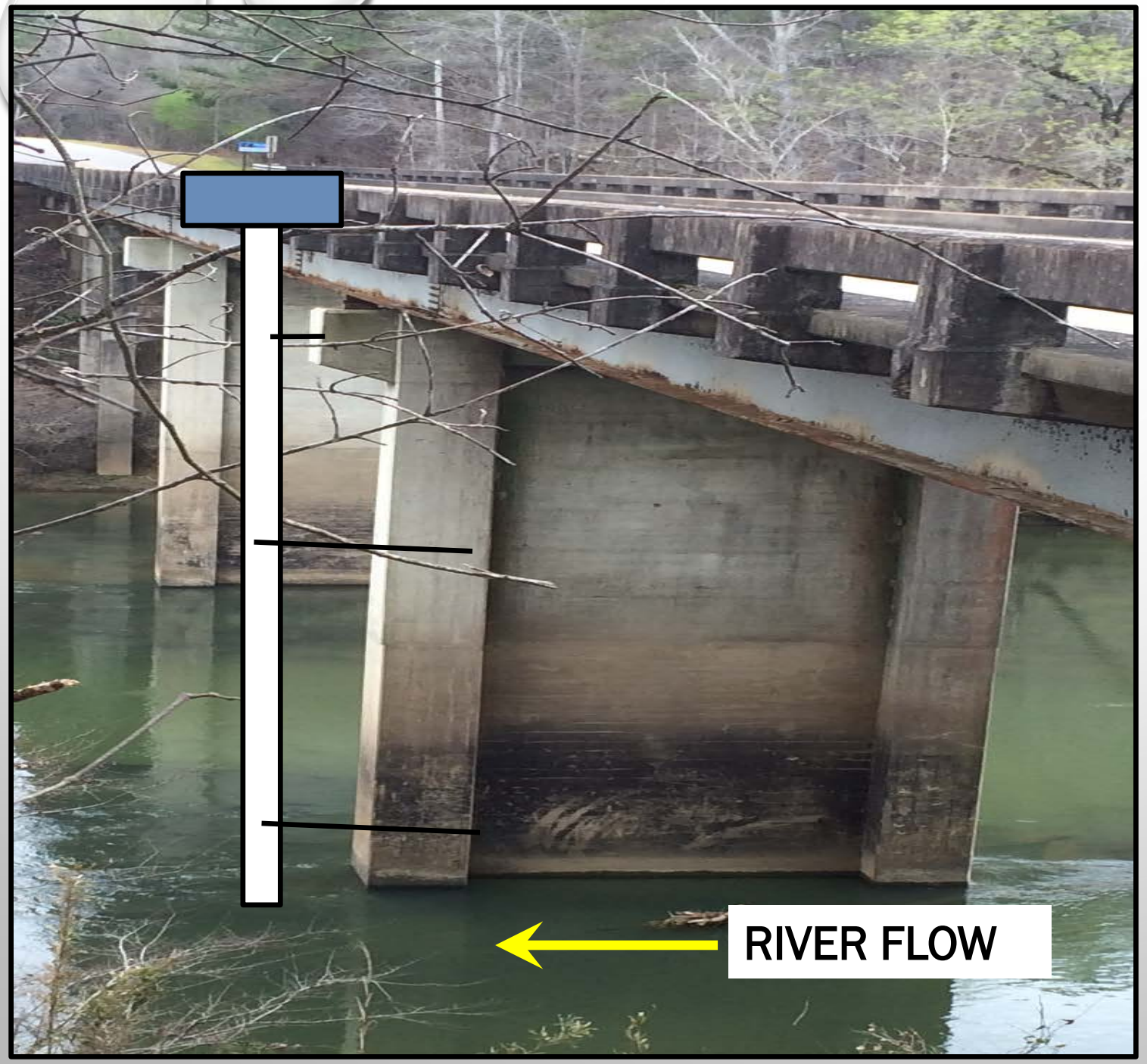
From “10 Tips to Prevent Biofouling on Water Quality Instruments”, YSI / XYLEM

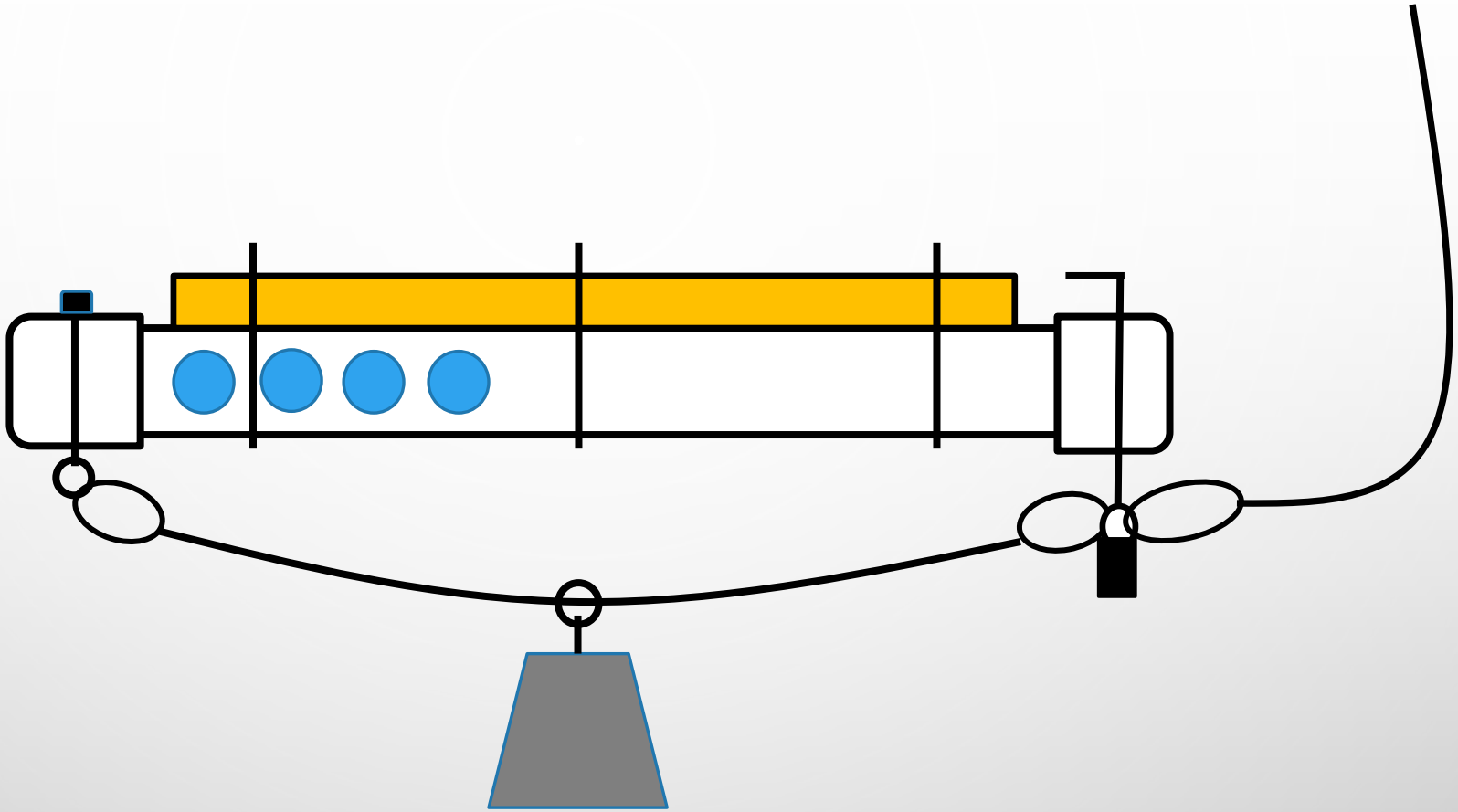
HYPOTHETICAL EXAMPLE #2



HYPOTHETICAL EXAMPLE #2



- PERMISSION TO ATTACH INSTRUMENTATION TO A BRIDGE IS GENERALLY REQUIRED!!
- ACCESS, SAFETY, SECURITY

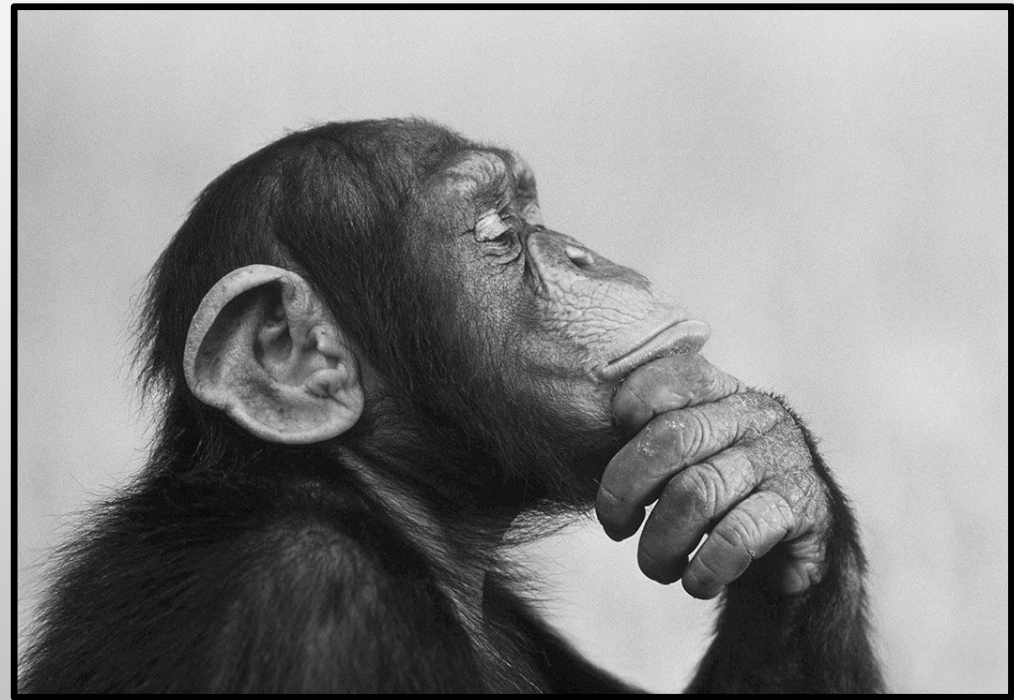


WATER QUALITY PARAMETERS

- WATER TEMPERATURE
- PH
- DISSOLVED OXYGEN
- TURBIDITY
- CHLOROPHYLL
- WATER LEVEL / DEPTH
- OTHERS?

THINK ABOUT THIS

- ACCESS
- SAFETY
- EQUIPMENT SECURITY
- POWER SUPPLY
- LIGHTNING
- FOULING



LESSONS LEARNED

- DATA QUALITY IS MORE IMPORTANT THAN DATA QUANTITY
- RECORD EQUIPMENT SERIAL NUMBERS BEFORE YOU LEAVE IT UNATTENDED IN A REMOTE LOCATION
- POST DEPLOYMENT CALIBRATION CHECK (DO IT AND RECORD IT)
- POST DEPLOYMENT EQUIPMENT CLEANING (YUCKY BUT NECESSARY)

MORE LESSONS LEARNED

- TAPE IS YOUR FRIEND AND ZIP TIES ARE AMAZING
- BETTER SAFE THAN . . . .
- BE CREATIVE
- THINK AHEAD
- TAKE PHOTOS (OF EVERYTHING)

QUESTIONS

Before I refuse to take your questions, I have an opening statement.

Ronald Reagan

THANKS!!!

- LYNN SISK

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