

The Basics of Research Vessel Operation

What every scientist should
know

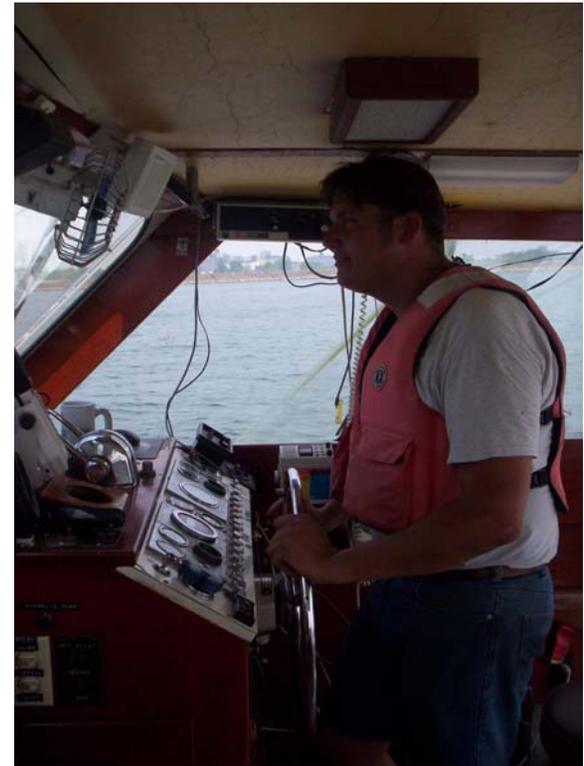
New Technologies

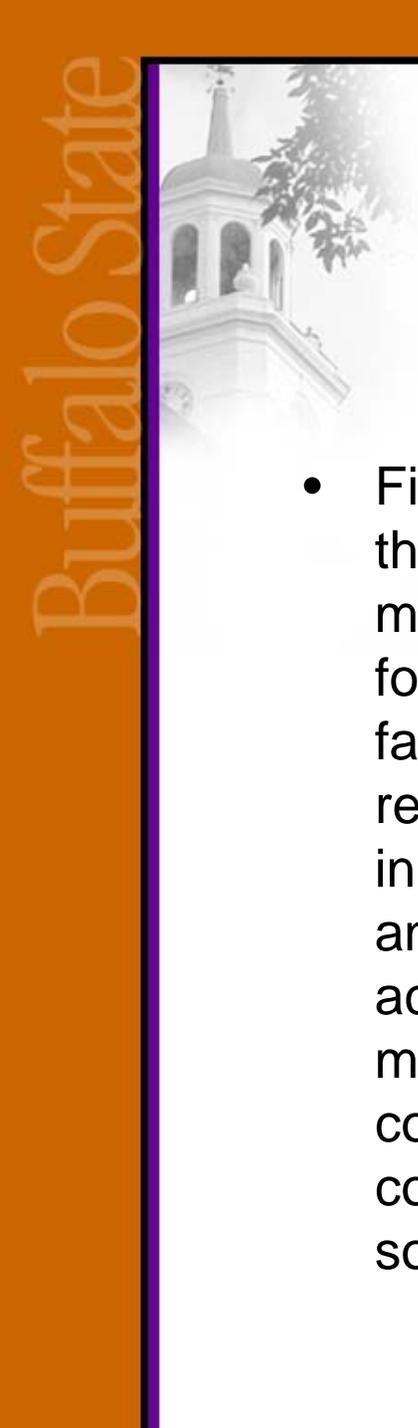
- GPS
- Ship designs
- Engines/fuel
- Hydraulics
- Electronics
- Weather



Captains as Professionals

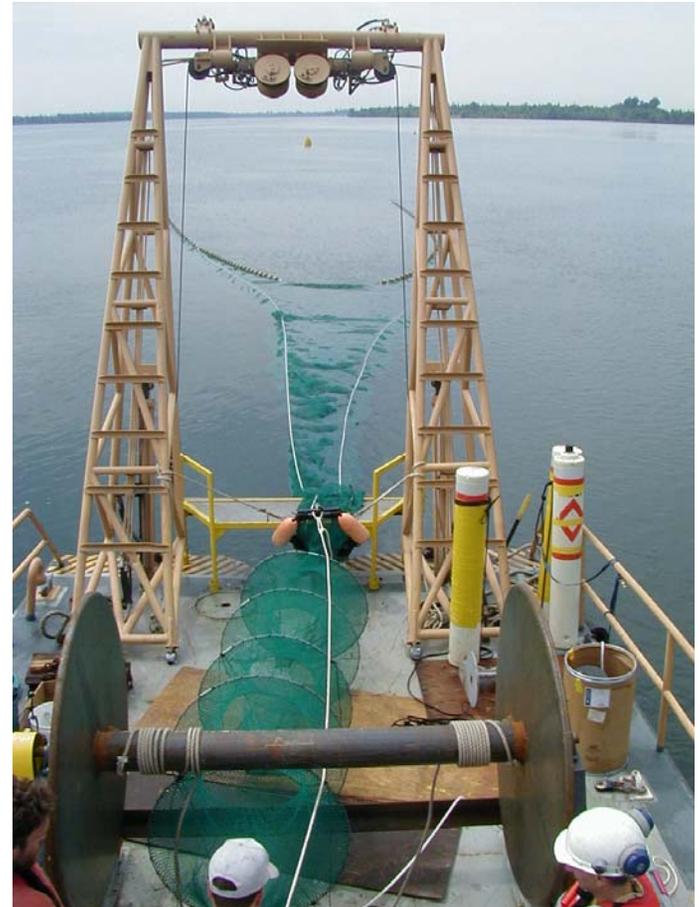
- Must stay up-to-date
- Research Captains have to be better than regular Captains
- Dangerous work
- Disconnect with scientist



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- The image features a vertical orange bar on the left side with the text "Buffalo State" written vertically in a light, semi-transparent font. To the right of this bar, there is a faded, grayscale image of a building with a prominent steeple, likely a Buffalo State building. The main content of the slide is a single bullet point.
- First and foremost the Captain is in charge. By Federal law this is defined. These laws have been held up in court and many Captains have had actions taken against them strictly for being the one in charge whether they were the causative factor or not in an incident. If the Captain or one of his representatives tell you to do something safety related (with in reason) you must do it, considered it an order. Situation and emergency can develop onboard that requires immediate actions without time for explanations and this is when you may here the crew raise there voice and bark commands. Remember this is based on their need to communicate quickly the immediacy of what needs done not something personal against you.

Planning

- Start with your basic plan
 - Have your objectives
 - If multiple sampling; determine pecking order
- Now engage the Captain
 - Knows the ship
 - Will know how to integrate your equipment
- Who is going to provide what equipment
- Equipment voltage, phase amperage requirements



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- Weight considerations and weight distributions and size of equipment - You may dream of carrying your entire lab on board along with the largest sampler you could buy, but there are both realistic size and weight considerations that must be adhered to for the safety of the crew and vessel. The Captain during your discussion can best tell you how much you can bring and where it can be stowed. Most research vessels have had stability tests performed that determine the center of buoyancy and righting arms. The captain will tell you where the best place to stow equipment to keep the center of gravity below the center of buoyancy

Planning cont.

- Weight and size of equipment
- vessels are equipped with specific size hardware that is built for the size of the boat and its stability
- equipment and weight and how you plan on deploying the device (weather over the side or off the stern)
- During the discussion you may find the cable that is onboard is too heavy and won't allow the device to sink correctly The captain maybe willing to splice a thinner wire on the end of the heavy wire or maybe change the wire out entirely.
- Or more importantly the wire or a block may not have the load rating for the equipment
 - Stowage
 - Winches, booms, wire and Attachments
 - Locking devices

Planning continued

- Lab space
 - Size of space
 - Is it shared
 - Chemical that can be used
 - Waste disposal
 - Computer capabilities
 - Electrical outlets
 - Ventilation
 - Stability of space (location)



Planning continued

- Who is going to perform what duties
 - Some ships it's the ship crew
 - Some ships you become part of the crew
- Particulars of the ship and sampling interaction
 - Need to station keep and how precise
 - Acceptable deviations off a track
 - Cruising speed of vessel
 - Time on station sampling
- Sampling area
 - Scientist have understanding of processes
 - Captain intimate knowledge of obstructions, known currents and hazardous conditions
 - Updated by USCG, other Captains, personal knowledge

Personal Gear

- PFD
- Shoes
 - No sandals
 - Steel toe boots
- Clothing
 - Layered
 - No loose ends
 - Gortex
- Other gear
 - Safety harness
 - Hard hats
 - Exposure suits



operational

- Clean ship
 - Besides keeping your gear organized and put away,
 - help with the general cleanup and galley area pickup adds to the safety and over all good feel of the vessel.
- Gear secured
- Motion sickness
 - start your course of treatment hours before you get underway
- Medical conditions
- Drug, alcohol, firearms & smoking
- Emergency safety procedures
 - Fire, Man Overboard, and Shipboard Safety
- Nothing goes over the side without the Captain's OK



Extra notes I have been sent.

- Know when the boat is leaving the dock and be on-time and prepared to leave. If the captain says "we leave at 08:00" plan on arriving early so you can load your gear on board and be ready to go at that time
- When there are multiple users a decision must be made about who gets priority
- If you are scheduling a boat that normally does day trips, make sure you communicate how long you need to be on the water. USCG rules require a relief crew after 12 hours. Long sampling trips may require scheduling additional crew and may require making arrangements to change the crew



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- If you are bringing your own equipment, make sure you bring any critical spare parts. Also bring your own tools, unless you've made arrangements to use the vessel's tool kit. I recommend using a checklist made well before the trip which you double check while loading on the boat.
- Planning horizons. Make sure you understand how far ahead to plan your trip. Some boats (such as ours) can be chartered as short as 24-48 hours in advance while other vessels may require weeks or months of pre-planning. In addition, understand how priorities are established, i.e. do certain agencies, institutions, grants or individuals get first choice of dates and can they "bump" other users.

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- Understand how your ships communication system works. Cell phones may not work in locations in the open water and your captain may be limited in what or how he communicates with people on shore.

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- Find out in advance how you are going to communicate positions/locations on the lake. While GPS coordinates are the norm for starting points, many sampling runs require going in a certain direction for a measured amount of distance and/or stopping at sampling points a certain distance (and direction) from the last one. If using a distance measurement, km are often used by scientists but make sure the captain can determine that distance, i.e. do you need to convert them to nm ahead of time. Or, does your captain just want the GPS coordinates to find?



Planning horizons

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