Bio:

Tom Evans attended the University of Washington and earned four bachelor's degrees (Geology, Biochemistry, Cell Biology, and Evolutionary Biology), then attended Washington University and earned an M.A. in Geology. He spent two years teaching and tutoring in the Seattle area before going back to graduate school to earn a Ph.D. in Earth Sciences and a Certificate in College Teaching at Montana State University. Throughout this process he realized how his cognitive skills could be utilized to benefit those working at height (fire/rescue personnel, rope access technicians, etc.) to improve their safety. So he started a research program to generate data that could be utilized by the professional rope user. His results have been presented at ITRS, MRA/NASAR, and state SAR conferences, where he champions the use of data and critical thinking to determine the safest methods to use. In addition, Tom is a champion of data-driven teaching and learning techniques, and seeks to help others use these methods to improve their professional practice. Tom started a nonprofit, SAR^3, to further rigging research and teaching.

Abstract:

The Problem: Human remains enter bodies of water daily through accidents, stupidity, nefarious acts, and suicide. Often relatives and bystanders expect local jurisdictions to locate and remove these remains from rivers, or remains are essential for furthering death investigations. The result is often a search to locate remains in rivers that can be both time consuming and expensive, while exposing many personnel to the dangers surrounding fluvial (river) environments. It would be helpful to know where remains are often located in rivers so high probability areas can be searched first and with greater care. This need was highlighted at ITRS 2018 where a drift block empirical trial was performed to aid in human remains recovery. The Science: The presentation will start with a brief overview of river morphology and flow, showing where sediment is eroded and deposited, and how to tell where each process takes place by just looking at a river. Once attendees understand how a normal river, generally, transports sediment, how remains are transported as bodies, body parts, and bones will be discussed. The work is based on my dissertation research where I spent a decade seeding bones in rivers and tracking their transport and deposition over space and time. It is best to think of human remains as having bulk densities close to water. Sometimes the remains are denser, sometimes lighter, and the densities will change over time. This means that bodies, body parts, and bones will go through phases of sinking and floating, often moving back and forth between the two conditions repeatedly. Consequently, remains do not act like rocks, or like floating debris (wood). Rather, they are unique clasts that behave quite stochastically (randomly). While remains are found throughout river systems, usually remains are associated with obstructions, either upstream or downstream of obstructions, or found in locations where deposition is actively occurring. Rules of Thumb For Locating Remains In Rivers:

1. Search upstream of obstructions
2. Search downstream of obstructions (in the eddies)
3. Search on bars of any kind (lateral bars, point bars, median bars, etc.)
4. Search all locations with flow velocity drops (where rivers get slower)
5. Search downstream and UPSTREAM in rivers with significant shipping, tidal influence, and large wildlife
6. Focus search on the same side of the river as remains entered (if known)
7. Remains can float, so river transported remains can be anywhere high water reached!

8. Remains will be buried and transported episodically, so repeatedly search before and after high flow events
9. Search hard to access locations with waterproof cameras (e.g., Gopros) on poles (e.g., hiking sticks, monopods, ski poles, etc.), then review the footage
10. Search using people trained in osteology of any kind
11. Utilizing cadaver dogs can be useful if dogs are trained well: dogs work better when flesh still on remains
12. Side scan sonar can be useful with a skilled technician and appropriate riverbed conditions
13. Contact jurisdictions downstream and upstream for help searching and for lost person info.
14. It is normal to find large remains and not smaller material

Recommendations taken from: Evans, Thomas, 2013, Fluvial Taphonomy, In: (Pokines, James and Symes, Steven, Eds.), Manual of Forensic Taphonomy, CRC Press, Chapter 6, p. 115-142