Tidally Influenced Crossings Call

Feb 2 2016

Matt Craig, Kevin Lucey, Pete Steckler, Brian Kelder, Megan Tyrrell, Scott Jackson, Allison Roy, Brad Compton, Adrian Jordan, Sara Becker, Julie Devers

Pete-engineering and permitting on head of tide restriction, make recs toward a tidal crossing assessment protocol, list of evaluation criteria (GIS and field), tested a tiny bit w. engineers, Burdick, NH Fish and Game, DOT. Took recs from the 9/10 meeting and tried to reconcile (some were contradictory). In process of taking list of parameters into a field data sheet to test this coming field season. They are on the rapid methods bandwagon, 2 people, 3-4 sites/day. Looking at- crossing size, condition, crossing ratio (Purinton and Mountain) river width compared to structure width, erosion evidence, fish passage parameters, inundation risk of structure (HW vs top of crossing) roadway inundation risk (how high is road above HW indicators). Look at SLAMM modeling w. 100 yr flood hazard, inundation risk to low lying infrastructure (who would be flooded if the restriction were removed?), Compare veg up and downstream of crossing

Kevin-statewide stream crossing advisory team, SADE dbf (state assets data exchange)

Scott Jackson- range of issues for tidal crossings is daunting. Right now they are only focusing on AOP. Brad focusing on tidal restriction metric. Lit search will include- fishes, diamondback terrapins, snapping turtles, - abilities for swimming, leaping, timing of when they will be moving (seasonally) and in relation to the tidal cycle (within the 24h cycle), identifying the critical points from when they HAVE to be moving. Plan is to divide streams to tidal creeks (mostly ocean water), tidal streams (in coastal locations where fresh and salt mix), tidal fresh (no salinity but tidally influenced). Each has a diff suite of species.

Allison- just starting. Sara finishing a masters right now. FT thru this calendar year on this project. Grant goes thru next summer.

Scott- they might have an interim product for early summer and ask people to see how well they work. Potentials; Velocity, turbulence, outlet drops

What variables is NH proposing that UMass could use?

Kevin- can supply them.

Pete- are you going to be out at low tide? Looking for indicators to increase flexibility in timing to get to multiple sites/day. Mid-tide velocities and restrictions for mummichogs (Eberhardt et al 2011), Is mid-tide flow velocity accelerated at the structure? Indicates that it is a restriction.

Change in streambed substrate above and below crossing? Indicator for changing velocity.

Scott- goal is rapid and simple as possible. Would want to see how NH’s indicators work progresses and learn from it as much as possible.

Julie Devers- doing culverts on the eastern shore, hard to know if a stream is tidal, fresh or not. Since they don’t have a tidal component yet from NAACC looking for scour pool on both sides and not assessing it if there is. Would love to try it out this summer if available. Lots of tidal fresh culverts.

Pete-will have a draft field form soon and will be happy to share it. Within the next week or so, would have something to distribute.

Adrian- what are the easiest things to measure in the field? Tradeoffs of when to hit a structure with respect to tidal stage. What is measurable rapidly?

Kevin- working w. NOAA Coastal Services Center tools and guidance to remotely measure high, low marsh using aerial photos, is there more high marsh upstream vs downstream?

Pete- Natural community assessment- NH has a key, 1 page cheat sheet for tidal wetland veg to send out in the field to test it. (will share)

Brian Kelder- wants to test drive anything even if not done. Doing QA/QC on non-tidal crossings anyway this summer and teams had uncertainty about whether some structures are tidally influenced and didn’t know what to do if so. Have supplemental measurements (some on tidal crossings) inverts, rough longitudinal profile relative to the road. Re: picking sites, when to be there is tricky to determine and arrange.

Matt- wants to see what NH is cooking up, had an informal protocol for a few years. Trying to collect info to put into proposals. Looking for utilities and other things that may not be visible on an aerial that influence project urgency/feasibility. Collecting hydro data will pass it to Brad Compton. Sometimes look at GW hydrology. Looks at veg, porewater salinity (Burdick recommendations), channel morphology- channel cross sections and longitudinal profiles. Lots of tidal dams- crossings protocols don’t work at them.

Scott- is passability other than 0 at some dams? HOT dams were used as ice ponds and some are low enough to be passable for an alewife run into the impoundment.

Pete- longitudinal profiles and hydro. Would love to deploy the protocol at sites where this more detailed info is available. Is this picking up the restrictions or is it calling everything a restriction? Would Matt and Brian be willing to test at some of their field sites? Seriousness of a restriction. Still trying to figure out what they should be measuring but they aren’t as confident in it until they have a chance to test it.

Matt- tidal restricted sites, getting into the channel can be a problem b/c soft sediments.

Consider using remote measurements prior to getting into the field b/c of safety concerns in scour pools.

Brad- tide range from NOAA VDatum, DEMs (much is LIDAR based), NWI salt marshes- regressions predict salt marshes from these data. Where overpredicting- site is freshwater but should be salt? What % of predicted salt marsh is actually fresh? Ratio of predicted/actual gives a coarse assessment.

Scott- 50 locations where actual measurements of water surface using chalk on a stick. Thought they could use aerials and found it didn’t work- Hunt Drury predicted this. Brad came up w. this approach after this. Brad might want coastline outside MA to check if modeling approach developed at MA sites works elsewhere.

Brad- Looking for measured tidal restrictions (water level) at spring tides on both sides of the structure. Looking for feedback from the field folks on qualitative assessments of how much a restriction affects a marsh.

Matt- Return the Tides- rapid assessment of tidal crossings. Tidal stage in 1 cycle- not only springs?. Only interested in a spring tide?

Brad- prob only interested in spring tide water levels.

Kevin- Tom Ballestero’s model for freshwater culverts in NH not easily transferred to tidal. 6 measurements to make assessment of hydraulic capacity (?). Would love to be predictive for these sites, rather than reactive to assessing restrictions. Have you thought about using tidal prism for a particular site- to predict about the required volume of water for a certain sized salt marsh?

Scott- (Not really) They were focused on trying to find out how bad a restriction was using other methods. Salt marsh Present/predicted is a better assessment than anything else they tried.

Brad- when restrictions are in series its hard to say which one is the problem.

Species list- from NH Fish and Game that Pete’s working from. Will share it with this group.

Megan- will circulate notes and contact list.

Brian- interacting w. towns, they want to know how they can prioritize their crossings for resilience considerations. Would love to wrap the ecological piece in.

Matt- would love to take a look at diff protocols that people put together, may have John Catena and Eric Hutchins looped in they are up to speed on risk, engineering and resilience factors.

Adrian- Should we talk at the fish passage conf? Lots of reasons to merge protocols

Matt- likes the buffet style suggested at the 9/10 workshop, tiered approach

Adrian- where are the pitfalls? Things that you didn’t collect data on might be the impediments when doing predictive analysis. Coordination key on this topic.