The Climate-Aquatics Blog

(Feb, 2011-Dec, 2015)

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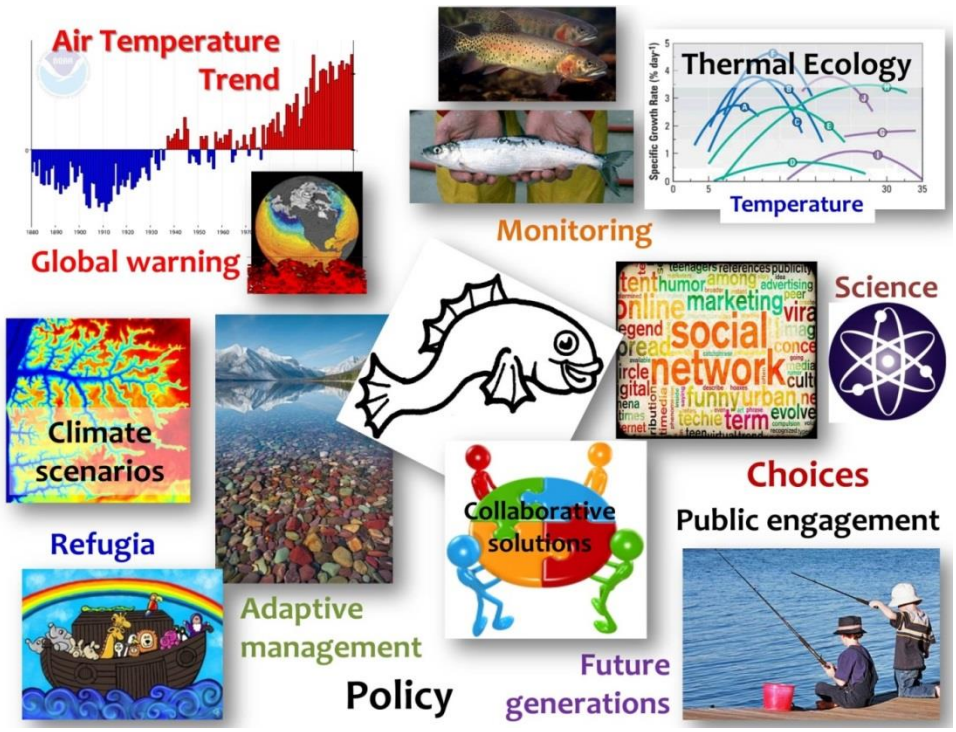

The intent of the Climate-Aquatics Blog was to aggregate, interpret & disseminate climate change related information among the global freshwater community so that the rate of understanding and adaptation was accelerated. By doing so through a series of semi-coherent, often offbeat, blog posts over the span of 5 years, the hope was to develop a common consciousness about key uncertainties, vulnerabilities, and possibilities, and the need to develop rigorous information for decision making and investment strategies so that aquatic ecosystems were efficiently conserved, managed, and preserved for future generations. Many of the ideas contained in the blog had their roots in studies conducted by myself or colleagues in the Rocky Mountains of the American West where the landscapes often, and continually, inspire. Hyperlinks to blog posts are arranged in thematic modules below, and each post links to additional science resources on specific topics.

Climate-Aquatics Overviews

Blog #1: Climate-aquatics workshop science presentations available online
Blog #2: Climate-aquatics synthesis reports for the western U.S.: Volume 1 and Volume 2
Blog #52: Review & key knowable unknowns
Blog #75: The End & a Beginning

Climate-Aquatics Thermal Module

Blog #3: Underwater epoxy technique for full-year stream temperature monitoring
Blog #4: A GoogleMap tool for interagency coordination of regional stream temperature monitoring
Blog #5: Massive air & stream sensor networks for ecologically relevant climate downscaling
Blog #6: Thoughts on monitoring air temperatures in complex, forested terrain
Blog #7: Downscaling climate change effects on river network temperatures using SSN models
Blog #8: Thoughts on monitoring designs for temperature sensor networks across river and stream basins
Blog #9: Assessing climate sensitivity of aquatic habitats by direct measurement of stream & air temps
Blog #10: Long-term monitoring shows climate change effects on river & stream temperatures
Blog #11: Long-term monitoring shows climate change effects on lake temperatures
Blog #12: Climate trends & climate cycles & weather weirdness

Blog #13: Tools for visualizing local historical climate trends
Blog #14: Leveraging short-term stream temperature records to describe long-term trends
Blog #15: Wildfire & riparian vegetation change as the wildcards in climate warming of streams
Blog #23: New studies describe historic & future rates of warming in northwestern US streams
Blog #24: NoRRTN: An inexpensive regional river temperature monitoring network
Blog #25: NorWeST: A massive regional stream temperature database
Blog #26: Mapping thermal heterogeneity & climate in riverine environments
Blog #40: Crowd-sourcing a BIG DATA regional stream temperature model
Blog #60: New report describes data collection protocols for continuous monitoring of temperature & flow in wadeable streams
Blog #61: Significant new non-American stream temperature climate change studies
Blog #62: More bits about the how, what, when, & where of aquatic thermalscapes
Blog #64: Building real-time river network temperature forecasting systems

Climate-Aquatics Hydrology Module
Blog #16: Shrinking snowpacks across the western US associated with climate change
Blog #17: Advances in stream flow runoff and changing flood risks across the western US
Blog #18: Climate change & observed trends toward lower summer flows in the northwest US
Blog #19: Groundwater mediation of stream flow responses to climate change
Blog #20: GIS tools for mapping flow responses of western U.S. streams to climate change
Blog #21: More discharge data to address more hydroclimate questions
Blog #22: Climate change effects on sediment delivery to stream channels

Climate-Aquatics Cool Stuff Module
Blog #27: Part 1, Spatial statistical models for stream networks: context & conceptual foundations
Blog #28: Part 2, Spatial statistical models for stream networks: applications and inference
Blog #29: Part 3, Spatial statistical models for stream networks: freeware tools for model implementation
Blog #30: Recording and mapping Earth's stream biodiversity from genetic samples of critters
Blog #53: DNA barcoding & fish biodiversity mapping
Blog #71: Harnessing social & digital network technologies to maximize climate effectiveness
Blog #X: Blogging fish science
Blog #72: The eDNA revolution and developing comprehensive aquatic biodiversity archives
Blog #73: BIG DATA as an engine for aquatic information creation
Blog #74: The National Stream Internet Project

Climate-Aquatics Biology Module
Blog #31: Global trends in species shifts caused by climate change
Blog #32: Empirical evidence of fish phenology shifts related to climate change
Blog #33: Part 1, Fish distribution shifts from climate change: Predicted patterns
Blog #34: Part 2, Fish distribution shifts from climate change: Empirical evidence for range contractions
Blog #35: Part 3, Fish distribution shifts from climate change: Empirical evidence for range expansions
Blog #36: The "velocity" of climate change in rivers & streams
Blog #37: Part 1, Monitoring to detect climate effects on fish distributions: Sampling design and length of time
Blog #38: Part 2, Monitoring to detect climate effects on fish distributions: Resurveys of historical stream transects
Blog #39: Part 3, Monitoring to detect climate effects on fish distributions: BIG DATA regional resurveys
Blog #41: Part 1, Mechanisms of change in fish populations: Patterns in common trend monitoring data
Blog #42: BREAKING ALERT! New study confirms broad-scale fish distribution shifts associated with climate change
Blog #56: New studies provide additional evidence for climate-induced fish distribution shifts
Blog #43: Part 2, Mechanisms of change in fish populations: Floods and streambed scour during incubation & emergence

Blog #44: Part 3, Mechanisms of change in fish populations: Lower summer flows & drought effects on growth & survival
Blog #45: Part 4, Mechanisms of change in fish populations: Temperature effects on growth & survival
Blog #46: Part 5, Mechanisms of change in fish populations: Exceedance of thermal thresholds
Blog #47: Part 6, Mechanisms of change in fish populations: Interacting effects of flow and temperature
Blog #48: Part 7, Mechanisms of change in fish populations: Changing food resources
Blog #49: Part 8, Mechanisms of change in fish populations: Non-native species invasions
Blog #50: Part 9, Mechanisms of change in fish populations: Evolutionary responses
Blog #51: Part 10, Mechanisms of change in fish populations: Extinction
Blog #63: Navigating stream thermalscapes to thrive or merely survive
Blog #65: The fish jumble as they stumble along with the shifting thermalscape

Climate-Aquatics Management Module
Blog #54: Part 1, Managing with climate change: Goal setting & decision support tools for climate-smart prioritization
Blog #55: Part 2, Managing with climate change: Streams in channels & fish in streams
Blog #58: Part 3, Managing with climate change: Maintaining & improving riparian vegetation & stream shade
Blog #59: Part 4, Managing with climate change: Keeping water on the landscape for fish (beaverin' up the bottoms)
Blog #66: Part 5, Managing with climate change: Barrier placements to facilitate fish flows across landscapes
Blog #67: Part 6, Managing with climate change: Assisted migration to facilitate fish flows across landscapes
Blog #68: Part 7, Managing with climate change: Identifying & protecting climate refugia as a strategy for long-term species conservation
Blog #57: Managing with climate change: Identifying & protecting climate refuge lakes for coldwater fishes
Blog #69: Part 8, Managing with climate change: Building climate-smart conservation networks (metapopulations + biodiversity + refugia)
Blog #70: Part 9, Managing with climate change: Restoration success stories that improve population resilience to climate change