MSU Watershed hydrology lab meetings archive (in reverse chronological order)

Fall 2023

Time and location: Thursday 14 December 12:00-13:30, Leon Johnson 827 or Webex
Leader: Rob Payn
Topic: Using multiple methods to characterize hyporheic exchange induced by log jams
Readings: Doughty et al. 2020 in Journal of Hydrology

Time and location: Thursday 30 November 12:00-13:30, Leon Johnson 827 or Webex
Leader: Meryl Storb
Topic: Nutrient supply, demand, and limitation in streams
Readings: Covino et al. 2018 in Freshwater Science

Time and location: Thursday 16 November 12:00-13:30, Leon Johnson 827 or Webex
Leader: Abaye Abebe
Topic: Connections between winter snowpack and low flows
Readings: Godsey et al. 2014 in Hydrological Processes

Time and location: Thursday 9 November 12:00-13:30, Leon Johnson 827 or Webex
Leader: Andy Bobst
Topic: How do we conceptualize the influence of beaver dam analogs on stream and groundwater temperatures
Readings: Munir and Westbrook 2021 in Water (MDPI)

Time and location: Thursday 19 October 12:00-13:30, Leon Johnson 827 or Webex
Leader: Meryl Storb
Topic: Coupling high frequency stream metabolism and nutrient monitoring
Readings: Jarvie et al. 2018 in Environmental Science and Technology

Time and location: Thursday 5 October 12:00-13:30, Leon Johnson 827 or Webex
Leader: Abaye Abebe
Topic: Discussion on material for an MT AWRA presentation regarding the influence of changes in climate on the distribution of recharge in mountain headwaters. We will primarily be discussing the presentation material but a paper is provided to get you in the right mindset for using SWAT models for snowmelt.
Readings: Grusson et al. 2015 in Journal of Hydrology

Time and location: Thursday 21 September 12:00-13:30, Leon Johnson 827 or Webex
Leader: Rob Payn
Topic: Recent advances in understanding the drivers of CO_2 emission in streams using high frequency CO_2 monitoring
Readings: Solano et al. 2023 in Limnology and Oceanography

Summer 2023

Time and location: Thursday 17 August 12:00-13:30, Leon Johnson 827 or Webex
Leader: Rob Payn
Topic: This meeting will be a programming jam session on the topic of automating document generation using tools like Rmarkdown.
Readings: None

Time and location: Tuesday 1 August 13:00-14:30, Leon Johnson 827 or Webex
Leader: Abaye Abebe
Topic: This paper focused on the impacts of warming on hydrologic fluxes of snow-dominated and transient watersheds, which seems relevant to Abaye's work on how the potential climate change (changes in temperature and precipitation) impacts mountain aquifer recharge in headwaters
Readings: Son and Tague 2019 in Ecohydrology

Time and location: Monday 17 July 12:00-13:30, Leon Johnson 827 or Webex
Leader: Rob Payn
Topic: Continued discussion on data management/curation. The concept of "decision nodes" for workflow organization. Mentoring/requirements for data management in academic labs.
Readings: None

Time and location: Tuesday 20 June 12:00-13:30, Leon Johnson 827 or Webex
Leader: Andy Bobst
Topic: River beads as a conceptual framework for building carbon storage and resilience to extreme climate events into river management
Readings: Wohl et al. 2018 in Biogeochemistry

Time and location: Thursday 1 June 12:00-13:30, Leon Johnson 827 or Webex
Leader: Abaye Abebe
Topic: This paper focused on how phase and energy change impact water partitioning in snow-dominated headwater systems, which is relevant to one of Abaye's chapters on climate change impact on the mountain headwater process domain.
Readings: Foster et al. 2016 in Environmental Research Letters

Spring 2023

Time and location: Thursday 4 May 12:00-13:30, Leon Johnson 827 or Webex
Leader: Meryl Storb
Topic: Practice for upcoming presentation at a meeting
Readings: None

Time and location: Wednesday 19 April 12:00-13:30, Leon Johnson 827 or Webex
***Note the deviation from our normal time**
Leader: Rob Payn
Topic: What do patterns in mass recovery from different resolutions of repeated tracer tests tell us about channel water balance and the importance of subsurface flow paths outside the "window of detection"?
Readings: Ward et al. 2023 in Water Resources Research

Time and location: Thursday 6 April 12:00-13:30, Leon Johnson 827 or Webex
Leader: Madison Foster
Topic: Discussion of manuscript being prepared for submission to WRR based on master's thesis.
Readings: Draft of manuscript from Madison

Time and location: Thursday 23 March 12:00-13:30, Leon Johnson 827 or Webex
Leader: Abaye Abebe
Topic: Practice in leading a discussion on a PhD research proposal in preparation for a committee meeting.
Readings: None

Time and location: Thursday 9 March 12:00-13:30, Leon Johnson 827 or Webex
Leader: Madison Foster
Topic: We will discuss the paper linked below, which focuses on characterizing stream reaches based on similar biogeochemical and hydrologic character. Madison is working on a similar analysis with JRW data and might also have some preliminary results to share if the stars align.
Readings: Valett et al. 2022 in Freshwater Science

Time and location: Thursday 2 March 12:00-13:30, Leon Johnson 827 or Webex
Leader: Meryl Storb
Topic: Discussion of draft of Lake Koocanusa selenium loading study.
Readings: Watch for email from Meryl with draft (please delete draft after meeting)

Time and location: Thursday 9 February 12:00-13:30, Leon Johnson 827 or Webex
Leader: Andy Bobst
Topic: Using agricultural irrigation infrastructure for managed recharge of groundwater
Readings: Kourakos et al. 2019 in Water Resources Research

Time and location: Thursday 2 February 12:00-13:30, Leon Johnson 827 or Webex
Leader: Rob Payn
Topic: I came across this paper while looking for recent publications in stream corridor hydrology that cite Adam Ward and Aaron Packman's review paper about advancing understanding of river corridor exchange. Looks like a data-rich paper about an intensively monitored near-stream hydrologic system that was also surveyed with electrical resistivity tomography techniques. It's coming from European hydrologists Gunter Bloschl and Julian Klaus, which is interesting because I don't recall them having much history of stream corridor work (though they are very well known hydrologists).
Readings: Bonanno et al. 2021 in Hydrological Processes

Fall 2022

Time and location: Thursday 8 December 12:00-13:30, Leon Johnson 827 or Webex
Leader: Meryl Storb
Topic: Thinking about the influence of spoils from mines on groundwater quantity and quality.
Readings: Nippgen et al. 2017 in Environmental Science and Technology

Time and location: Thursday 10 November 12:00-13:30, Leon Johnson 827 or Webex
Leader: Abaye Abebe
Topic: Hydrogeological response of alpine hillslopes to climate change.
Readings: Markovich et al. 2016 in Hydrological Processes

Time and location: Thursday 27 October 12:00-13:30, Leon Johnson 827 or Webex
Leader: Madison Foster
Topic: I would like to talk about how to apply this framework to different contexts. The general framework seems useful for talking about multiple drivers of diel signals and I'd be curious to hear other thoughts on whether this framework is useful for other applications.
Readings: Seybold et al. 2022 in Ecosystems

Time and location: Thursday 29 September 12:00-13:30, Leon Johnson 827 or Webex
Leader: Meryl Storb and Madison Foster
Topic: Preparation for MT AWRA presentations.
Readings: None

Time and location: Thursday 15 September 12:00-13:30, Leon Johnson 827 or Webex
Leader: Rob Payn
Topic: It's been about a year since our last discussion about data curation. I would like to have a "round the room" discussion on our experiences with the work we should be doing toward making sure others can reproduce our analyses.
Readings: None

Time and location: Thursday 1 September 12:00-13:30, Leon Johnson 827 or Webex
Leader: Madison Foster, Rachel Anderson, ?
Topic: Practice presentations for the CREWS all hands meeting
Readings: None

Summer 2022

Time and location: Wednesday 17 August 13:00-14:30, Leon Johnson 827 or Webex
NOTE: Andy will be in town and in person! Happy hour at the Tap Room, 17:00 after the meeting, to celebrate Andy's presence and publication
Leader: Andy Bobst
Topic: Approaches to understanding the response of riparian ET to the elevation of groundwater levels created by stream restoration. How do we get a grasp on the implications to the stream corridor water budget?
Readings: Jarchow et al. 2017 in Ecological Engineering

Time and location: Wednesday 27 July 13:00-14:30, Leon Johnson 827 or Webex
Leader: Madison Foster
Topic: Review the developing story about the diel variation in nitrate in Moccasin terrace streams across sites and seasons. Reading is for background material.
Readings: Oviedo-Vargas et al. 2022 in JGR Biogeosciences

Time and location: Wednesday 6 July 13:00-14:30, Leon Johnson 827 or Webex
Leader: Abaye Abebe
Topic: I will lead the lab meeting on Wednesday afternoon and am currently working on hydrologic partitioning in mountain headwater process domain in the context of climate change impacts on deep percolation and local groundwater recharge, and its discharge using the coupled SWAT-MODFLOW model. I am at the stage of developing the conceptual model framework for building the SWAT-MODFLOW model using the driving data based on the Hyalite headwater catchment. For our lab discussion, I am hoping to talk through the details of how SWAT and MODFLOW are coupled to represent hydrologic processes and groundwater-surface water interactions.
Readings: Bailey et al. 2016 in Hydrological Processes

Time and location: Tuesday 21 June 13:00-14:30, Leon Johnson 827 or Webex
Leader: Meryl Storb
Topic: Evaluating trends in loads and concentrations for constituents that are tied to mining pollution in Lake Koocanusa.
Readings:
1. https://montanafreepress.org/2022/04/05/lake-koocanusa-selenium-rule/
2. https://thenarwhal.ca/teck-resources-coal-transboundary/

Time and location: Tuesday 31 May 13:00-14:30, Leon Johnson 827
Leader: Rob Payn
Topic: Pedagogical tutorials for taking a deeper dive into graphing in R.
Readings: see email

Spring 2022

Time and location: Friday 6 May 11AM-12:30PM, Leon Johnson 827 or Webex
Leader: Andy Bobst
Topic: The hydrologic influence of beaver mimicry structures in semi-arid streams
Reading: Pearce et al. 2021 Hydrological Processes

Time and location: Friday 22 April 11AM-12:30PM, Leon Johnson 827 or Webex
Leader: Madison Foster
Topic: How to teach the fundamentals of numerical solution of differential equations to those who haven't had the full series of calculus, diffeqs, computer programming, and numerical methods.
Reading: See email from Madison

Time and location: Wednesday 30 March 11AM-12:30PM, Leon Johnson 827 or Webex
Leader: Madison Foster, Bruce Boles, Ann Marie Reinhold, Rob Payn
Topic: Preparation for the Montana Aquatic Research Colloquium
Reading: None

Time and location: Friday 11 March 11AM-12:30PM, Leon Johnson 827 or Webex
Leader: Abaye Abebe
Topic: Numerical investigation of bedrock groundwater recharge at the hillslope scale
Reading: Gardner et al. 2020 Hydrologic Processes

Time and location: 4 March 11AM-12:30PM, Leon Johnson 827
Leader: Madison Foster
Topic: Light and flow regimes regulate the metabolism of rivers
Reading: Bernhardt et al. 2022 Proceedings of the National Academy of Science

Time and location: 15 February 10:30AM-12PM, Leon Johnson 827
Leader: Andy Bobst
Topic: Practice talk on research on the influence of beaver mimicry restoration on evapotranspiration.
Reading: None

Fall 2021

Time and location: 11AM - 12:30PM, Thurs 16 Dec, Leon Johnson 827 or Microsoft Teams
Leader: Meryl Storb
Topic: Interpretation of diel patterns in stream nitrate concentrations
Reading: Greiwe et al. 2021 Biogeosciences, Location of study site (Google Earth kmz)

Time and location: 11AM - 12:30PM, Thurs 2 Dec, Leon Johnson 827 or Microsoft Teams
Leader: Rob Payn
Topic: Data curation and mediating the decay of the scientific ethic of reproducibility
Reading: None

Time and location: 11AM - 12:30PM, Thurs 18 Nov, Leon Johnson 827 or Microsoft Teams
Leader: Abaye Abebe
Topic: A numerical experiment exploring conceptualizations of mount block hydrology. This paper assesses the sensitivity of the simulated mountain block hydrology for different representations of subsurface layers by varying hydraulic conductivity values in each layer, which is tied with our work trying to figure out how water storage behavior changes for the case of homogeneous single-layer versus multi-layers in the intermountain basin.
Reading: Rapp et al. 2020 Water Resources Research

Time and location: 11AM - 12:30PM, Thurs 4 Nov, Leon Johnson 827 or Microsoft Teams
Leader: Rob Payn
Topic: Examples of thinking about oxygen, carbon, and nitrate signals in streams all at the same time.
Reading: Jarvie et al. 2018, Environmental Science and Technology

Time and location: 11AM - 12:30PM, Thurs 21 Oct, Leon Johnson 827 or Microsoft Teams
Leader: Andy Bobst
Topic: The role of beaver and riparian wetness in response of an ecosystem wildfire.
Reading: Fairfax and Whittle 2020, Ecological Applications

Time and location: 11AM - 12:30PM, Thurs 7 Oct, Leon Johnson 827 or Microsoft Teams
Leader: Madison Foster and Abaye Abebe
Topic: Preparation for poster presentations at the Montana American Water Resources Association meeting.
Reading: None

Time and location: 11AM, Thurs 23 Sep, Leon Johnson 827 or Microsoft Teams
Leader: Madison Foster and Caitlin Mitchell
Topic: Hot spots and hot moments in stream corridors.
Reading: Harms and Grimm 2008, Journal of Geophysical Research

Time and location: 11AM, Thurs 9 Sep, Leon Johnson 827 or Microsoft Teams
Leader: Rob Payn
Topic: How does inference from multiple tracers lead to more generalized model of catchment hydrological and biogeochemical function? This was the question in my head after reading the title of the reading. I'm interested in reading the paper to figure out how Ben and the very long list of et al. have framed these ideas from literature review and syntheses. Review papers can be a bit hit or miss for discussion, but I have a lot of respect for Ben's ability to express ideas it a fashion that drives interesting discussions.
Reading: Abbott et al. 2016, Earth Science Reviews

Spring 2021

Time and location: 13:00-14:30, May 3, 2021 – Microsoft Teams

Leader: Rob, Madison, Lyra
Topic: Prep for presenters for the 2021 SFS meeting.
Reading: NA

Time and location: 13:00-14:30, April 27, 2021 – Microsoft Teams

Leader: Andy Bobst
Topic: A discussion on the Nash et al. approach to assessing the effect of stream restoration in mountain meadows on water storage.
Reading: Nash et al. 2018 Ecohydrology

Time and location: 14:00-15:30, April 13, 2021 (note the change in time - 1 hr later than our normal meeting time) – Microsoft Teams

Leader: Lyra Reynolds
Topic: Discussion of Lyra's results from research on estimating metabolism from joint DIC and DO signals. The reading assignment is a paper we have read before. We don't anticipate discussing the paper much, directly, but it provides a good example of how to use DIC signals to estimate metabolic activity.
Reading: Lynch et al. 2010 JGR Biogeosciences

Time and location: 13:00-14:30, March 30, 2021 – Microsoft Teams

Leader: Madison Foster
Topic: Practice talk for Madison's seminar presentation
Reading: No reading

Time and location: 13:00-14:30, March 24, 2021 (Note change in day from regular schedule) – Microsoft Teams

Leader: Rob Payn
Topic: Is Bayes Theorem the better way to teach experimental design, regardless of whether Bayesian statistics are reported in the analysis?
Reading: Watch the YouTube video from 3Blue1Brown
https://www.youtube.com/watch?v=HZGCoVF3YvM
and read Hoegh 2020 Journal of Statistics Education

Time and location: 13:00-14:30, March 2, 2021 – Microsoft Teams

Leader: Meryl

Topic: A discussion on strategies to be a good scientific writer. In addition to the reading please bring your favorite resources related to good writing.
Reading: Hotaling, 2020 Limnology and Oceanography Letters

Time and location: 13:00-14:30, February 16, 2021 – Microsoft Teams
Leader: Abaye
Topic: Contribution of alluvial groundwater to watershed outlet flow
Reading: Käser and Hunkeler 2016 WRR

Time and location: February 2, 2021
Leader: Madison
Topic: JRW results from the summer and plans for this field season
Reading: Reijo et al. 2018 Freshwater Science

Time and location: January 19, 2021
Leader: Andy
Topic: Discussion of paper recently submitted to JAWRA
Reading: Fundamental Influences of Beaver-Mimicry Stream Restoration on Seasonal Dynamic Storage: A Groundwater Modeling Analysis

Spring 2019

29 January 14:00-16:00 - 827 Leon Johnson Hall

Discussion leader: Andy Bobst

Topic: Practice talk on Beaver Mimicry for AFS meeting. A 15 min overview of monitoring and modeling, with focus on quantity (not temperature).

Reading:

Abstract

Lautz et al., 2019

15 January 15:30-17:00 - 827 Leon Johnson Hall

Discussion leader: Rob Payn

Topic: Document automation in MS Word.

When working on theses or preparing manuscripts for publication, I have seen a lot of students needlessly waste a lot of time on manually changing formatting because they don't know about some of the document automation features in Word. I would like to talk about some of those as a group. Also bring your best MS Word tips and tricks to share.

Reading: None

Spring 2018

24 April 15:00-16:30 - 827 Leon Johnson Hall

Discussion leader: Juliana D'Andrilli

Topic: Exploring spatiotemporal variation in stream DOM using complementary fluorescent PARAFAC models to better understand hydroecological regimes

Reading: Hudson et al. 2007 pages 631-638

Examples of work like this in progress from SFS 2017 and AGU 2017 posters were provided via email.

5 April 15:00-16:30 - 827 Leon Johnson Hall (Note the change to Thursday)

Discussion leader: Todd Schlotfeldt

Topic: Inferring metabolism from coupled signals of DO and pCO2 data. Practice for poster presentation an LRES colloquium.

20 Mar 15:00-16:30 - 827 Leon Johnson Hall

Discussion leader: Rob Payn

Topic: Coupling biogeochemical processes with DIC regimes in streams. Characterizing links between biology and geology in karst streams.

Reading: de Montety et al. 2011 - Chemical Geology

8 Mar 15:00-16:30 - 827 Leon Johnson Hall (Note the change to Thursday)

Discussion leader: Anna Price

Topic: The relationship between forests and snowmelt

Reading: Lundquist et al. 2013 - Water Resources Research

20 Feb 15:00-16:30 - 827 Leon Johnson Hall

Discussion leader: Andy Bobst

Topic: Groundwater Modeling to Understand the Effects of BMR

I have completed the groundwater modeling that I planned on doing for generic Beaver Mimicry Stream Restoration (BMR). That is, the effects of 4 types of BMR on gaining, losing, and strongly losing streams. I have also completed the sensitivity analysis looking at 6 model parameters (K, Sy, Stream Conductance, Drain Conductance, Drain Elevation, max ET rate, and ET extinction depth).

I would now like to work with the group to develop the story in my mind before attempting to write it up. I will plan to send out a rough conclusions section before the meeting. To get everyone in the right frame of mind, I selected a reading dealing with using groundwater modeling to understand stream restoration.

Reading: Kasahara and Hill, 2008 - Ecological Engineering

6 Feb 15:00-16:30 - 827 Leon Johnson Hall

Discussion leader: Meryl

Topic: Diel signals in stream chemistry

I have only skimmed this paper up to this point but I have been wanting an excuse to read it for a while.

Upon first glance it seems promising; I hope it will invoke some ideas for the 2016 24hr sampling experiments that Juliana and I completed. In addition it may be good for Todd and Rob because looks at metabolism models in addition to information from two station nitrate sensors to gain more information about instream metabolic processes.

Reading: Hensley and Cohen, 2016 - Water Resources Research

23 Jan 15:00-16:30 - 827 Leon Johnson Hall

Discussion leader: Rob Payn

Topic: Inorganic carbon chemistry and metabolism.

Reading: Lynch et al. 2010, Journal of Geophysical Research: Biogeosciences

Fall 2017

14 Dec 15:00-16:30 - 827 Leon Johnson Hall

Discussion leader: Andy Bobst

Topic: Effects of Beaver Dams and BMR on fish.

Readings: Bouwes et al., 2016

30 Nov 15:00-16:30 - 827 Leon Johnson Hall

Discussion leader: Rob Payn

Topic: Metabolism and hydrology in beaver-affected vs. non-beaver-affected stream reaches

Readings: Wegener et al. 2017, WRR

16 Nov 15:00-16:30 - 827 Leon Johnson Hall

Discussion leader: Meryl Storb

Topic: Metabolic regimes

Readings: Bernhardt et al. 2017 Limnology and Oceanography

31 Oct 15:30-17:00 - 827 Leon Johnson Hall

Discussion leader: Rob Payn

Topic: Dynamic hyporheic storage due to dam operations

Readings: Sawyer et al. 2009 Hydrologic Processes

12 Oct 15:00-16:30 - 827 Leon Johnson Hall

Discussion leader: Meryl Storb

Topic: AWRA Prep

Readings: Moore et al. 2007

5 Oct 15:00-16:30 - 827 Leon Johnson Hall

Discussion leader: Andy Bobst

Topic: AWRA Prep

Readings: Arrigoni et al., 2008

21 Sep 15:00-16:30 - 827 Leon Johnson Hall

Discussion leader: Rob Payn

Topic: Comparing metabolic rates across western and midwestern rivers

Readings: Hall et al. 2016 Ecosystems

7 Sep 15:00-16:30 - 827 Leon Johnson Hall

Discussion leader: Rob Payn

Topic: Organizing for the new semester

Readings: None

Summer 2017

31 May 14:00-16:00 - 827 Leon Johnson Hall

Discussion leader: Meryl Storb, Juliana D'Andrilli, Rob Payn

Topic: Practice or preparation for presentations at the Annual Meeting of the Society for Freshwater Science.

- Meryl Storb - QUANTIFYING CHANGES IN THE LENGTH OF THE GROWING SEASON IN MOUNTAIN STREAMS BASED ON OBJECTIVE EVALUATIONS OF TRENDS IN HYDROLOGIC REGIMES (SIZER)
- Juliana D'Andrilli - PATTERNS IN DISSOLVED ORGANIC MATTER CHARACTER PROVIDE PERSPECTIVE ON THE INTERCONNECTION AND FUNCTION OF WATERSHED ECOSYSTEMS
- Rob Payn - THEORETICAL INCONSISTENCIES BETWEEN WHOLE-STREAM UPTAKE KINETICS INFERRED FROM SYNTHETIC CONSTANT-RATE AND INSTANTANEOUS RELEASE TRACER EXPERIMENTS.

Readings: None

11 May 17:15-19:00 - Rob's house

Discussion leader: Rob Payn

Topic: Hypothesis testing and philosophy of science in hydrology. We will discuss the following **two** short papers from a recent "Debates" special section in WRR. After reading these, I am interested in whether you agree with the final couple sentences of the Baker 2017 paper.

Readings: Bloschl 2017 and Baker 2017

Spring 2017

24 April 11:30 - LJH 827:

Discussion leader: Meryl Storb

Topic: Practice for LRES colloquium

Readings: TBD

11 April 17:30 - Rob's house:

Discussion leader: Braden Leach

Topic: The consequences of development for hydrology and water quality at Big Sky, with a focus on the effects of impervious surface. Readings are drafts of a scientific review and extension materials that are the products of the independent study. There is still a lot of markup, so you might want to read in "simple markup" or "no markup" mode, under the "revision" tab in Word.

Readings: Will be emailed

4 April 17:15 - Rob's house:

Discussion leader: Rob Payn

Topic: Seminal paper in hyporheic reseach. Coupling numerical experimentation with field data.

Readings: Harvey and Bencala 1993

20 March 11:30 - LJH 827:

Discussion leader: Andy Bobst

Topic: What are the documented ecological benefits of stream restoration? Does stream restoration actually improve system function, or are we just making it look "pretty"?

Readings: Rios-Touma et al., 2015

27 February 17:00 - Rob's house:

Discussion leader: Meryl Storb

Topic: I am using SiZer to quantify the timing of important events in annual hydrographs. My original focus was thinking about how shifting peak flow timing may lengthen the algal growing season, but we are also thinking about broader applications of the method for hydrograph analysis. In addition to the Sonderegger paper, I am looking for a 1-2 page text book style discussion of hydrograph analysis to go with this, but I haven't had any luck yet. If I find something I'll send it via email (and I promise it will be short).

Readings: Sonderegger et al. 2009

7 February 17:00 - Rob's house:

Discussion leader: Rob Payn

Topic: I am providing a paper that is just about ready to be submitted. We can discuss this paper in two different ways. First, what are the mechanics of getting a manuscript ready for submission? Second, what are the basics of inferring metabolism rates from the variation in DO concentrations over time?

Readings: Sent via email (material that is not publicly available, yet).

Fall 2016

1 December 17:30-? - Rob's house:

Discussion leader: Emily Hultin

Topic: Deriving biofuels from algal primary productivity.

Readings: Singh et al. 2011

9 November 14:30-16:00 - LJH 827

Discussion leader: Rob Payn

Topic: "Connectivity" is a buzzword in hydrology that can mean different things to different people; yet understanding of the connections among systems mediated by water is usually central to understanding the function of environmental systems. I have not read this Bracket et al. (2013) paper, but its goal appears to be putting some organization and structure around use of the word "connectivity" in different hydrologic contexts. I think a good discussion on this topic will be relevant to all the lab projects.

Readings: Bracken et al. 2013

19 October 14:30-16:00 - LJH 827

Discussion leader: Andy Bobst

Topic: Bank storage during high flow events

Readings: Chen and Chen 2003

26 September 17:30-? - Rob's house:

Discussion leader: Meryl Storb

Topic: My plan for Monday is to get us all thinking about the best way to convey our ideas for the Big Sky research for the MT AWRA audience. Since I am still in heavy data collection mode and have done limited analysis I am hoping to present a poster that outlines our motivations and current projects in Big Sky - I am hoping our discussion will revolve around different and good approaches to do that. I think it would also be beneficial to talk about the near future of the Big Sky project, so we can finish up with some discussion about upcoming opportunities and how we should proceed towards future presentations (Jules and ASLO).

Readings: Roley et al. 2014

14 September 15:00-16:00 - LJH 827:

Discussion leader: Rob Payn

Topic: Organizational

Readings: None

Summer 2016

11 August 17:00-?, Location Rob's house:

Discussion leader: Rob Payn

Topic: Using one-dimensional transport models to extract information about aqueous biogeochemical kinetic rates from active tracer releases in streams

Readings: The following paper introduces the conceptual model for the method, Covino et al. 2010.

Here are notes from a theoretical analysis we will work through for discussion, Notes from Beehive model

28 July 16:00-?, Location Meryl's house:

Discussion leader: Andy Bobst

Topic: What do natural streams look like? What implications does that have for stream restoration?

Readings:

1. Montgomery 2008, Dreams of Natural Streams (Science)
2. Walter and Merritts 2008, Natural Streams and the Legacy of Water Powered Mills (Science)

5 July 14:00-16:00, Leon Jonson 827:

Discussion leader: Juliana D'Andrilli and Meryl Storb

Topic: 24 Hour sampling of fluorescent DOM, concentration of DOC and nutrients, and stream metabolism measurements.

Reading: Logue et al 2016 Experimental insights into the importance of aquatic bacterial community composition to the degradation of dissolved organic matter. Logue et al 2016

21 June 14:00-16:00, Leon Jonson 827:

Discussion leader: Emily Hultin

Topic: Linking sun exposure with organic matter and bacterial growth in aquatic environments

Reading: Contrasting effects on solar UV radiation for dissolved organic sources and bacterial growth Tranvik and Bertilsson 2001

6 June 13:00-15:00, Leon Johnson 827:

Discussion leader: Rob Payn

Topic: Thinking about the effects of climate change on stream flow

Reading: Stewart et al. (2004) Changes in snowmelt runoff timing in western North America under a "business as usual" climate change scenario. Climatic Change 62(1) 217-232.

16 May 14:00-15:30, Leon Johnson 827:

Discussion leader: Juliana D'Andrilli

Topic: Feedback for SFS talk, entitled "INTEGRATING CHEMISTRY, MICROBIOLOGY, AND ECOSYSTEM ECOLOGY TO DISCERN THE NATURE AND FATE OF DISSOLVED ORGANIC MATTER IN STREAMS"

Reading: Aquatic and terrestrial ecosystems are linked through the transfer of energy and materials. Allochthonous organic matter (OM) is central to freshwater ecosystem function, influencing food webs, trophic state, and nutrient availability. Interdisciplinary approaches are necessary to fully understand ecosystem dynamics. We performed a laboratory processing experiment on naturally occurring OM leachates from leaves, grasses, and pine needles. Measures of water chemistry, OM optical and molecular characterization, bacterial abundances, microbial assemblage composition, respiration, and C:N:P were integrated to comprehend the nature and fate of OM. Peak processing occurred after two days, with spikes in bacterial abundances, respiration rates, microbial assemblage shifts, and maximum C utilization. Respiration rates and microbial assemblages differed by OM leachate identity. Leachate lability did not correlate with higher respiration rates, however, C processing efficiency correlated with lability over time. Originally comprised of amino acid-like, labile fluorescent species, stream OM became more recalcitrant after 16 days, indicating stream processing OM humification over time. Our study highlights the importance of interdisciplinary approaches for understanding the processing and fate of OM in aquatic ecosystems.

Spring 2016

4 May 09:00-10:30, Leon Johnson 827 (NOTE CHANGE FROM REGULAR TIME):

Discussion leader: Juliana D'Andrilli

Topic: DOM molecular composition and fluorescent linkages above and below the golf course at Big Sky. How can we assess changes with stream metabolism measurements?

Reading:

D'Andrilli et al 2015 (focus on the results)

Stubbins et al 2014 (EEMs and FT-ICR MS)

Stubbins et al 2014 (supplemental information)

18 April 14:00-15:30, Leon Johnson 827:

Discussion leader: Meryl Storb

Topic: Practice talk for LRES seminar

Reading: None

4 April 14:00-15:30, Leon Johnson 827:

Discussion leader: Meryl Storb

Topic: I like the perspective that this paper takes by examining stream ecosystems based on function and not just structure. I am thinking about longer term measurements of metabolism in addition to the synoptic study which is short term - I

am hoping to discuss how ideas in the paper could translate into the Big Sky study. The focus will be on the metabolism portion of the paper although the leaf litter decomposition is interesting too.

Reading: Young et al. 2008 JNABS

21 March 14:00-15:30, Leon Johnson 827:

Discussion leader: Andy Bobst

Topic: Practice talk for LRES seminar

Reading: None

7 March 14:00-15:30, Leon Johnson 827:

Discussion leader: Meryl Storb

Topic: Conceptual model for the Big Sky Project

Reading: Anticipating Stream Ecosystem Responses to Climate Change: Toward Predictions that Incorporate Effects Via Land–Water Linkages (Davis et al. 2013)

Davis et al. 2013, Ecosystems

22 February 14:00-15:30, Leon Johnson 827:

Discussion leader: Juliana D'Andrilli

Topic: Temporal scaling and DOM linkages in the Big Sky Metabolism Project

Reading: Watershed hydrology and dissolved organic matter export across time scales: minute to milleninium (Sobczak and Raymond 2015)

8 February 14:00-15:30, Leon Johnson 827:

Discussion leader: Andy Bobst

Topic: Monitoring and Modeling the effects from Beaver Dams

Reading: Simulating the effects of a beaver dam on regional groundwater flow through a wetland (Feiner and Lowry, 2015)

25 January 14:00-15:30 (NOTE CHANGE IN TIME), Leon Johnson 827:

Discussion leader: Rob Payn

Topic: Proposal writing

Reading: Sample beaver mimicry proposal provided by email.

Fall 2015

4 December 4:30PM:

Discussion leader: Andy Bobst

Topic: Documenting changes in Surface-Water/Groundwater interactions following stream restoration.

Reading: Daniluk et al., 2013

29 October 2:30PM, 827 LJH:

Discussion leader: Rob Payn

Topic: Understanding the interactions of DOM quality and ecosystem function, a case study based on applicability of the "priming effect" concept in streams

Reading: Hotchkiss et al. 2014

15 October 2:30PM, 827 LJH:

Discussion leader: Juliana D'Andrilli

Topic: Dissolved organic matter characterization by ultrahigh resolution mass spectrometry

Reading: Folder on google drive

1 October 2:30PM, 827 LJH:

Discussion leader: Andy Bobst

Topic: Science and water management - Prep for AWRA

Reading: Engle et al., 2011, Integrated and adaptive management of water resources

Spring 2015

30 April 4:00PM, 827 LJH:

Discussion leader: Andy Bobst

Topic: Beaver dams as a part of the alluvial/riparian hydrosystem

Reading: Westbrook, C. J., D. J. Cooper, and B. W. Baker. 2006. Beaver dams and overbank floods influence groundwater-surface water interactions of a Rocky Mountain riparian area. Water Resources Research 42(6), W06404. DOI:10.1029/2005WR004560.

16 April 4:00PM, 827 LJH:

Discussion leader: Meryl Storb

Topic: Are there generalized controls on metabolism across biomes?

Reading: Mulholland, P. J., C. S. Fellows, J. L. Tank, N. B. Grimm, J. R. Webster, S. K. Hamilton, E. Marti, L. Ashkenas, W. B. Bowden, W. K. Dodds, W. H. McDowell, M. J. Paul, and B. J. Peterson. 2001. Inter-biome comparison of factors controlling stream metabolism. Freshwater Biology 46, 1503-1517.

2 April 4:00PM, 827 LJH:

Discussion leader: Liza Harris

Topic: Parsing the components of terrestrial ecosystem metabolism from eddy covariance carbon flux data.

Reading: Stoy, P. C., G. G. Katul, M. B. S. Siqueira, J. Juang, K. A. Novick, J. M. Uebelherr, R. Oren. 2006. An evaluation of models for partitioning eddy covariance-measured net ecosystem exchange into photosynthesis and respiration. Agricultural and Forest Meteorology 141(1), 2-18.

19 March 4:00PM, 827 LJH:

Discussion leader: Andy Bobst

Topic: Using in-stream structures to enhance hyporheic exchange - relations to beaver mimicry structures.

Reading: Hester, E.T., and Doyle, M.W., 2008, In-stream geomorphic structures as drivers of hyporheic exchange: Water Resources Research v. 44, W03417, 17 pgs.

19 February 4:00PM, 827 LJH:

Discussion leader: Meryl Storb

Topic: Linking land use in catchments to nutrient retention and metabolism in stream ecosystems.

Reading: Von Schiller, D., E. Marti, J. L. Riera, M. Ribot, J. C. Marks, and F. Sabater. 2008. Influence of land use on stream ecosystem function in a Mediterranean catchment. Freshwater Biology 53(12)2600-2612.

5 February 4:00PM, 827 LJH:

Discussion leader: Adam Sigler

Topic: Use of hydrochemical tracers to understand residence times and flow paths in soil/groundwater systems.

Reading: Capell, R., D. Tetzlaff, I. A. Malcolm, A. J. Hartley, C. Soulsby. 2011. Using hydrochemical tracers to conceptualise hydrological function in a larger scale catchment draining contrasting geologic provinces. Journal of Hydrology 408(1-2) 164-177.

22 January 4:00PM, 827 LJH:

Discussion leader: Rob Payn

Topic: Trends in Alkalinity in US Rivers. Thinking about ecosystem energetics and the processing of oxygen in rivers naturally leads to the linked processing of carbon in rivers. Inorganic carbon is an important contributor to alkalinity. Lets discuss a broad survey of the sources of alkalinity in US rivers.

Reading: Stets, E. G., V. J. Kelly, and C. G. Crawford. 2014. Long term trends in alkalinity in large rivers of the conterminous US in relation to acidification, agriculture, and hydrologic modification. Science of the Total Environment 488-489, 280-289.

Fall 2014

4 December 12:30, 827 LJH:

Discussion leader: Andy Bobst

Topic: Concepts behind predicting low flow magnitudes

Reading: Matonse and Kroll 2013, Journal of Hydrology

20 November 12:30, 827 LJH:

Discussion leader: Liza Harris

Topic: Evapotranspiration During the Growing Season

I want to take a look at some of the data I have collected in the wheat fields in the Judith Basin as well as talk about the paper below emphasizing on the ET aspect more so than the carbon dioxide aspect of the paper.

Reading: Prueger et al. 2004, Environmental Management

6 November 12:30, 827 LJH:

Discussion leader: Rob Payn

Topic: I want to talk about how fundamental information from streams, distributed in both time and space, may be a good aggregate source of information for inference of watershed function, both in terms of water quantity and quality. One of the confounding problems of this idea is separating what changes are happening in the stream system itself, vs what changes are occurring because of differences in what is being delivered to the stream system.

Reading: Williamson et al. 2008, in Frontiers in Ecology and the Environment

23 October 12:30, 827 LJH:

Discussion leader: Meryl Storb

Topic: Continued discussion on GRFP proposal, the influence of temperature and nutrient loading on stream metabolism regimes in developed alpine environments

Reading: NSF criteria, Proposal draft provided by EOD Tuesday 21 October

NSF GRFP HOMEPAGE

NSF GRFP Solicitation

16 October 12:30, 827 LJH:

Discussion leader: Meryl Storb

Topic: GRFP proposal, the influence of temperature and nutrient loading on stream metabolism regimes in developed alpine environments

Reading: Gardner and McGlynn 2009

25 September 12:30, 827 LJH:

Discussion leader: Andy Bobst

Topic: Methods of measuring ground-surface water interactions

Readings: USGS Report on the Smith River, Bobst AWRA abstract

Note that the USGS report is quite long. If time is limited, please focus on the water level and temperature data on pages 42-64.

11 September 12:30, 827 LJH:

Discussion leader: Liza Harris

Topic: Soil Moisture Retrieval From Space and making data available online in an easy to use format.

Reading: Soil Moisture Retrieval from Space: The Soil Moisture and Ocean Salinity (SMOS)Mission by Kerr et al.

(http://www.cmima.csic.es/files/webcmima/docs/biblio-pdf/doc_158.pdf)

28 August 13:00, 827 LJH:

Discussion leader: Rob Payn

Topic: Organizational meeting for Fall Semester

Reading: none