MULTI Summer Institute 2018 - Water in the Southwest
June 4-8, Auraria Campus

Monday, June 4th - Watersheds & Dam

Time	Event	Location
8:00 - 9:45	1. **Welcome & Introductions (Janelle and Rich)** 2. Team, Participant Observers, MESO (flow chart JJ). Everyone introduces themselves. Make sure they do on the community padlet too. MULTI overview (GLOBE, OWL, MESO partnership--non MESO are welcome to join--MESO explains); ask re pre-preparation activities. collect Paperwork; any questions? (Linda) 3. We can come onsite for PD or sessions with students (share menu and dates for workshops here--informal poll of preferred dates, times, topics). 4. (8:25) STEM Modules--one each day that can be scaled up or down. Make sure all are signed into padlet--peer coaching 5. (8:30) GLOBE apps; NASA video at https://www.globe.gov/support/media/videos 6. (8:35) Look over agenda: Student hat during day; teacher hat at the end. Space for those who want to get more into GLOBE or differentiate in other ways) 7. (8:40) icebreaker (Zoom book--get to know each other) (Yoko designs; ___ runs) 8. (8:55) A community based approach! (from expectations). Make sure people get to know each other and mix up groups during activities; at the end of the day, work in grade levels 9. (9:00) Definition of STEM we're using; watch 4 min video from Buck Institute at http://www.bie.org/object/video/the_hydrology_project_making_learning_relevant problem-based learning; Generating EQs; 10. (9:10) Inclusive STEM pedagogies built in, math practices; sheltered English & academic language development, cooperative learning; group explains Windows and MIrrors 11. (9:15) Focal Students. On padlet community page at https://padlet.com/jjaz2co/maupxodt3o4m --describe students; end of each day they reflect	SCI 1117

	on effectiveness on module page) 12. (9:25) Implementation & Data Collection. Go over IRB, have all sign, collect forms, make copies, get copies to each person. Describe Focal students as a lens (strengths based, growth mindset) 13. (9:30) Career pathways--do brainstorm with careers related to water quality in groups; then discuss. (Help connect for students who may NOT envision a STEM pathway for themselves, or have STEM role models) (Janelle) 14-18. (9:35) Start with standards--really dive in groups, read through (Janelle) ● questions on large posters, in groups, use small post its for answers (Rich): (Circulate around room; we circulate too) What is precipitation? What IS a watershed? When precipitation falls, where does it go? What are all the factors that impact that? How do watersheds impact our access to drinking water? How do watersheds impact water quality? What role do humans play in managing watersheds? What role do dams play in watersheds? How do the water issues we face in the southwest similar to or different than other parts of the world and country? (We record on padlet)	
9:45 - 9:55	**Break (Dawn): Introduce what's coming next. Post questions to the teachers:** What are your experiences with traditional teaching strategies? How do you teach the scientific method through project based learning?	SCI 1117
10:00-11:00	Community College of Denver Student Panel (Intro by Dawn--course designed to be project based; have questions ready for student panel) Rio Mora fieldwork on dams. Students share experience, teachers fill out Venn diagram during session. Fill in anything that's missing on Venn (post both on padlet).	SCI 1117
11:00 - 12:00	Lunch (need help with set up starting at 10:30) outdoors (optional EPA event--MOU signing in courtyard) Use GLOBE cloud app at lunch; add to posters	SCI 1086
12:00-2:15	Dams & Stream Table Stations All watch videos as intro; make notes in notebook Explain the two stations	SCI 1097

	5-10 min. Hook: *Video of flooding here:* *https://www.youtube.com/watch?v=XwbdAJGvj_o* *Resources* (3:35 Broomfield/Boulder, CO flooding 2013, thousands flee record rainfall caused several dams to breach. *How do we respond to flood crisis? How can we avoid a breach in this infrastructure/ how is it regulated?)* *Video re building on floodplain (3 min)* *https://toolkit.climate.gov/case-studies/building-smart-floodplain* (3:21 How the city of Fort Collins plans development for building in a floodplain. *What are the challenges and considerations to building in a floodplain? What are the different floodplain levels (100 yr. Vs 500 yr.)* 12:10-12:20 Dawn's Intro (5-10 min.) **12:20-1:00 DAMS Station (finish by 1:00)** **(Dawn and some CCD students)** Graphic organizer on erosion (post to padlet) Generate EQs with group (What is erosion? What kinds of things increase or mitigate different kinds of erosion? How is flooding a normal part of the water cycle? What causes flooding? How does flooding impact humans? What are some of the ways humans try to control flooding? What kinds of careers have to understand flooding?) **Engineering Stream tables station (Randi)** Link for how to build table: _____ Generate EQs with group (How do we engineer a river table? Optional Where do we need to locate homes in a watershed? What happens when conditions are more extreme? (averages vs 100 year flood) NEED houses, trees, cars, roads (Flooding, dams, erosion activity)	
2:15-3:00	Plan & Apply **(Janelle leads; all circulate)** 2:15 Model padlet use step by step--crowdsource in grade level bands Go back to standards & problems for backward design; look over resources on padlet on community page and on module page; add to them! 2:40 Reflect: apply to focal students on padlet module	SCI 1117

	2:50 Quick eval: https://www.surveymonkey.com/r/2018SummerInstitute-Day1	
3:00 on	3-4 Participant Observer Debrief https://padlet.com/jjaz2co/742n7mgasdl6 (smaller mixed groups followed by whole group; collect list of topics over the week for Friday stations) (3-5 MESO Group Work) MESO van here	SCI 2005 SCI 1117

Tuesday, June 5th - Assessing Water Quality

https://padlet.com/jjaz2co/4ciuddf6dmot

Time	Event	Location
8:00 - 9:00	Water Quality Talk: "How Forest Fires Affect the Watershed" with Dr. Ashley Rust (Dawn's awesome graphic organizer; add to padlet; educators add to notebooks)	SCI 1086
9:00 - 10:00	(Measuring Water Quality on Earth and From Space) 9:9:15 Revisit post it posters 9:15 -10 GLOBE Transparency Station (from Practicing your protocols)--(Tyler & Rich leads) https://www.globe.gov/documents/11865/9b8e507c-fea7 Do a reflection afterwards--What challenges did you encounter during this activity? _____ NEED science notebooks, transparency field guide (Make copies), transparency tube, plastic cup, bucket, spoon, food coloring, pipette, graph paper, rulers, colored pencils	Outdoors SCI 1086
10:00 - 10:55	Remote Sensing Talk & Activities (Dimitri)	SCI 1086
11 - 11:30	10:55-11 break Data Analysis Activity walk around--interpreting graphs and charts--(Tyler) (Janelle sent ppt from Maria's activity)	SCI 1086
11:30-12:15	Lunch (outside?) Lunch: talk on EcoSchools (Jennifer Hammonds) Cloud data; add to posters	SCI 1086

12:15-2:30	Water Quality Activities What are the ways we can measure the quality of the water? What do these different measurements tell us? [Collect according to GLOBE instructions but without their sheets at the stations] (Organize before we go out--explain what the stations are) Go outdoors--Water Quality Stations (temperature, collect macroinvertebrates, collect water, DO, establish hydrosphere site; post all to padlet). Use GLOBE app (need a lead for each station) Bring science notebooks; colored pencils, measuring tape; glue sticks Indoors--run labs (assign students to each) (macroinvertebrates, pH, transparency, temp, nitrates, alkalinity, conductivity; make notes in notebook)	SCI 1097 Creek
2:30 - 3:00	Plan & Apply **(Rich)** **Make sure they're in grade level bands; share notes and info from notebooks to padlet** **MESO announces their plan for 3** **How would you use the transparency measurements?** **Divide into grade level bands/GLOBE interest** Data onto GLOBE app (help them find where the GLOBE protocols are available online for those who want them) Talk about setting up hydrosphere site; show where to find video on padlet, we can go on site to support that for those who are interested Go back to standards & problems for backward design; look over resources on padlet on community page and on module page (today and yesterday); videos posted on community page--what is MULTI column Reflect: apply to focal students on padlet module Quick eval: Survey Monkey	SCI 1086
3:00 on	3 -4 Participant Observer Debrief (3-5 MESO Group Work)	SCI 2005 SCI 1086
4:00-11:00	MESO Urban Star Party *Optional Activity*	Civic Center Park

Make sure to get set up for Wed. pollution activity

Wednesday, June 6th - Water Pollution & Remediation

Time	Event	Location
8:00 - 10:15	Water Chemistry & Pollution Activity **(Sarah/Randi; RoseAnn prepped ppt; need to prep beakers)** (Make sure they're in mixed groups--one of each of us has a group) Present the PBL; let them know there's an assessment (see info on water chemistry below) Generate EQs: How do we define clean water? How clean does water have to be to drink? To swim in? How does the Platte get polluted? (story from Maria's class-Potomac) BEAKERS with each pollutant prepared and labeled, AQUARIUM, powerpoint with image of pollutant source, what are the possible pollutants? Animate each answer. Notetaker is graphic with each source, they add pollutants and effects. As read story each participant dumps their beaker in. How do you communicate the science of water pollution to different communities? Talk in your groups about what the key information is. Come to consensus. Make a plan. Make sure it's accessible. Create a fact sheet to raise awareness--use graphs, charts, tables to make your case (Math connections) (Show examples of fact sheets and PSAs) Reflect and make notes	SCI 1117
10:15 - 10:30	Break	SCI 1117
10:30 - 11:30	Talk on Wetlands--Dr Sarah Schlieman Engineered wetlands Activity/graphic organizer (___)	SCI 1117
11:30 - 12:15	Lunch (make plans for afternoon); Try to Use Cloud Observer App	SCI 1086
12:15 - 1:45	Wetlands as Water Filters Field Exercise **(Sarah and Randi)** Visit to engineered wetland on campus Sketch and label the design in notebooks Use guidebooks to identify plants; add labels and notes to the sketch What plants would you include in the design of an engineered	SCI 1105 Tivoli biosphere

	wetland to improve the water quality specific to the pollutants in that water? Make notes in notebook	
1:45 - 3:00	Plan & Apply (Janelle) Look at MULTI SPEC link Jen posted--change over time for water quality Go back to standards & problems for backward design; look over resources on padlet on community page and on module page Reflect: apply to focal students on padlet module (go back to yesterday's as well) Quick eval: Survey Monkey Arrange carpools for tomorrow; give out maps; bring state ID; wear a coat; meet at 7th St. Garage circle tomorrow morning	SCI 1117
3:00 on	3-4 Participant Observer Debrief (3-5 MESO Group Work)	SCI 2005 SCI 1117

Thursday, June 7th - Water, Weather, & Climate

Time	Event	Location
8:00 - 12:15	National Ice Core Lab Field Trip (make sure to have ID and coat with you) ***Carpool will meet by Parking Garage at 8:00*** Tour starts at 9 (enter lab at door S22) done by 11 am Fill out AMAZING graphic organizer; add to notebook (post to padlet) Mike MacFerrin will be there; do Q&A in a classroom	National Ice Core Lab
12:15 - 1:00	Lunch--Cloud Estimation activity (led by teachers from last year) Need blue and white paper; glue sticks (**Rich & Educators**) Split into grade level groups for afternoon	SCI 1013
1:00 - 1:45	GLOBE Atmosphere Activities (Connect to PBL, have them discuss application) ● Group A: GLOBE Protocols (**Jennifer T. & Jen B.**) ○ Clouds (standard process & Observer app) ○ Weather station Air Max/Min Temp (and Precip ? TBC) ● Group B: Using Weather & Climate Data (**Rich & Tyler**) ○ Visualizing weather data using legos, colored pencils, graphs ○ Modified jigsaw	Outdoors adjacent to Science Building SCI 1097
1:45 - 2:30	GLOBE Atmosphere Activities (Connect to PBL, have them discuss application)	

	• Group B: GLOBE Protocols (**Jennifer T. & Jen B.**) ○ Clouds (standard process & Observer app) ○ Weather station Air Max/Min Temp (and Precip ? TBC) • Group A: Using Weather & Climate Data (**Rich & Tyler**) ○ Visualizing weather data using legos, colored pencils, graphs ○ Modified jigsaw	Outdoors adjacent to Science Building SCI 1097
2:30 - 3:00	Plan & Apply (Rich & Janelle) Grade level groups share outs: 1. How do you make your work outside work? 2. How are you thinking about actually implementing your ideas? 3. What are your ideas for maintaining your MULTI community connections? Reflect: apply to focal students on padlet module Quick eval: Survey Monkey	SCI 1097
3:00 - 4:00	Participant Observer Debrief (3-5 MESO Group Work)	SCI 2005 SCI 1097

TEAM DINNER AT 5--Brooklyn's (decide on workshop dates, times, topics; share on Friday)

Friday, June 8th - Water Resource Use & Management

Time	Event	Location
8:00 - 9:30	Water Use Activities/Application with Focal Students (Janelle) Get in grade level groups **Strength vs. Deficit Based Views of Focal Students** Provide each group with a focal student description. We will do two brief learning activities, then discuss in groups how the focal student would possibly do with the activities. Okay students, today we are talking about water scarcity **Warm Up: Video re water use CO river (2 minutes)** What is the role of the Bureau of Reclamation? What are some of the factors that make planning today's water budget more complicated? What are some of the technology tools that facilitate the Bureau's work? What does "critical threshold" mean? How and why did planners revise the pumping station design? Toolkit (2:22, The water shortage from the Colorado Basin and a potential improvement to the current short-falls in the water supply. *How can a water shortage crisis be avoided?* **Discuss** **Water Use for different purposes** (10 minutes) (powerpoint)	SCI 1117

	So this is designed to be a scaffolded learning activity. Groups report out on focal students. How would they have done? Jigsaw Strength vs. Deficit views article. Come to consensus on definitions. Janelle projects one description of focal student. What could be possible deficit language? Create a table of deficit vs. strengths based. (Deficit: Assumptions, generalizations, hearsay, low expectations, stereotypes, fixed mindset. Strength: growth mindset, high expectations (expectancy theory), specifics, attributions). Do gallery walk of resources posted around the room. Rework focal student description as a group. Discuss with the whole group Revisit how your frame your own focal students. What deficit lenses have you been using? How can you shift to a more strengths based view of the students? Post to padlet. Close the activity--reflection	
9:30 - 10:00	Break and raffle	SCI 1117
10:00 - 11:00	Dam Talk! (Dawn introduces) Bill McCormick, Colorado State Dam Safety Engineer (Dawn has INCREDIBLE graphic organizer; add to padlet) safety issues, Environmental issues, Q&A	SCI 1117
11:00 - 11:30	21st Century Career Connections (Helping make learning relevant to all students) (Yoko will work on what's available through GLOBE/UCAR) (can go on padlet so teachers can crowdsource) Resource fair on guest speakers and field trips; skype (Denver water sends you their education person when you really want the scientist) OWL expo in the spring--Josh Kumin here Career videos (produced by Cameron)	SCI 1117
11:30 - 12:30	Lunch (facebook for photos!) talk: Scientific posters (RoseAnn) GLOBE Student Research Symposium (Jen B. & Rich); resources online on GLOBE (add to padlet) Plan on next year! Posters from Rio Mora, Nate's group Q&A	SCI 1113

12:30 - 2:00 **(w break as needed)**	12:30-1:30 Plan & Apply--Grade Level Bands Raffle prize distribution Go back to standards & problems for backward design; look over resources on padlet on community page and on module page Reflect: apply to focal students on padlet module **Copy the padlets and adapt--make sure everyone is able to** **1:30-2 Stations: (can add to list and teachers can ask for topics):** 1.Building out modules on padlet (Cassie) 2. Making posters as summative assessments (RoseAnn and Rich) 3.GLOBE Q & A (Jen Bourgeault and Jennifer Taylor) 4. Revisiting Graphic Organizers (Dawn & __ 5. EcoSchools (Jennifer Hammonds) 6. Inclusive Pedagogies & PBLs (Janelle)	SCI 1117
2:00 - 2:15	Break	SCI 1117
2:15 - 3:00	MULTI Summer Institute Wrap Up Upcoming workshop dates coming soon--need to go over feedback and plan locations (Rich) Discuss implementation data collection online or by interviews (Janelle) teachers in webinars; teacher hotline; plug SRS; where to find videos; e training (Jen Bourgeault) paperwork and stipends (Linda) Wrap up and full week evaluation: Survey Monkey (Mariana)	SCI 1117l
3:00-4:00	Final Participant Observer Debrief	SCI 2005