CZO Network All Hands Meeting
Sept. 21-24, Fish Camp, CA
Planning Agenda

Meeting Goals:

1) Share science results and working plans
2) Develop ideas and concrete plans for cross-site science and integration.

Day 0 – Sunday evening Sept 21

Minutes	Time	Activity
30	4:00-7:00	Registration; *Informal discussions, sign up for field trips, post posters*
120	6:00-8:00	Dinner (rolling buffet, eat at your convenience)
120	7:00-9:00	Starter: Poster session – *Each CZO brings 3 posters on below topics (more NatGeo map/infographic than research presentation) to facilitate discussion and cross-CZO ideas and give a sense of place, progress and plan.* – *(1) Wayfinding (maps, conceptual model) (2) Gadgets & Installations (3) CZTope*

Day 1 – Monday Sept 22

Minutes	Time	Activity
60	7:00-8:00	Breakfast; Load ppts onto computer & put up posters
40	8:00-8:40	Introduction to meeting – SSCZO welcome & outline meeting aims (10 min) – *Quick round the room names:* 150 people @ 10 s/person = 25 min
45	8:40-9:25	Integrative keynote talk on CZ science – Mike Goulden, Southern Sierra CZO
20	9:25-9:45	Charge to participants: Introduction to themes – Session Conveners
60	9:45-10:45	Break & poster viewing

90	10:45-12:15	**Theme 1 – What controls CZ properties and processes?** – Lead talk (15 min) – Short talks (6 x 1 min thumbnails = by invitation) – Introduction to sub-themes (5 min) a. *How does critical zone development depend on lithology and geologic legacy?* b. *How does critical zone development vary with climate?* c. *What is the role of microbes in the critical zone in mediating solute evolution of runoff water and carbon processing?* d. *How does hillslope aspect, as it influences local climate, affect critical zone evolution and structure?* – Discussion (60 min)
75	12:15-1:30	Lunch, with a talk on Ecosystem Services
90	1:30-3:00	**Theme 2 – What is response of CZ structure, stores, and fluxes to climate?** – Lead talk (15 min) – Short talks (6 x 1 min thumbnails = by invitation) – Introduction to sub-themes (5 min) *a. What is the relationship between concentration & discharge?* *b. What factors moderate soil-organic carbon relationships in shallow and deep soil?* *c. How do material & energy fluxes across boundaries relate to climate?* *d. Especially on shorter time scales, what controls biogeochemical stores and fluxes within the CZ?* *e. How do microbial communities (activity, composition) influence biogeochemical stores and fluxes?* – Discussion (60 min)
30	3:00-3:30	Break & poster viewing
90	3:30-5:00	**Theme 3 – What is response of CZ structure, stores and fluxes to land use change?** – Lead talk (15 min) – Short talks (6 x 1 min thumbnails = by invitation) – Introduction to sub-themes (5 min) *a. How does the CZ respond to climate change & land-use/management effects?* *b. How does regolith affect vegetation?* *c. How do (bi-direction) vegetation-regolith dynamics influence CZ structure, stores & fluxes, including water & C?* *d. How do material and energy fluxes across boundaries relate to land use change?* – Discussion (60 min)
10	5:00-5:10	Instructions for breakout groups

80	5:10-6:30	Breakout groups on themes 1-4 (organization meetings before dinner) – Multiple breakouts on each theme – Use of main meeting room plus common areas at hotel Agenda: i) what each CZO is doing (questions, methods & tools, findings), ii) impediments, iii) what we can do together, iv) synthesis for planning & next steps (summary document with next steps)
60	6:30-7:30	Dinner -- breakout groups can continue over dinner if desired
90	7:30-9:30	Poster viewing Additional time for breakout groups

Day 2 – Tuesday Sept 23

Minutes	Time	Activity
45	7:00-7:45	Breakfast; *prepare for departure for field trips*
	8:00	Depart Tenaya Lodge
	8:00-5:00	Field Trips / All day
	Trip 1	**Rim Fire & post-fire landscape mosaic in Yosemite** Rim Fire, Cherry Lake, Hetch Hetchy Reservoir, and Crane Flat Lookout (J. Roche, M. Conklin) *Start in high severity burn outside the park and then spend the rest of the day discussing the much more mosaicked burn pattern in the park (high severity largely confined to areas of previous high severity burns, the rest a nice mix of low and moderate severity). There are plenty of places to see all this. Hetch Hetchy is good because the mix of rock and oak forest really protects the reservoir from most fire effects. On the way from Hetch Hetchy back to the park, see several levels of fire intensity. Finish the day at Gin Flat in the park to see the snow monitoring equipment and a bit of the low intensity burn.*
	Trip 2	**The Forest sweet spot: Water transfers across an elevational transect** San Joaquin Experimental Range, Providence Catchment research installations (M. Goulden, E. Stacy) *This trip explores regolith development and forest ecosystem activity at several stops along the Southern Sierra CZO elevational transect. The transect runs from the oak-pine woodlands of the foothills, through dense and tall mid-elevation mixed-conifer forests to the sparser subalpine forests at the higher elevations. Between the*

		summer water limitation of the lower elevations and the winter cold limitation of the higher elevations there lies a sweet spot for forest activity and growth. The mid-elevation forests are active through every season. During the dry summer months, photosynthesis may be sustained subsurface water reserves. Forest activity is attenuated in drier years more quickly in areas with shallow soil than in areas with deep soil. This field trip will take participants to the San Joaquin Experimental Range, and then to installations at Providence Creek. Additional stops will include road cuts to examine soil development and biogeochemistry discussions.
	Trip 3	**A study in contrasts: Bedrock nutrients and forest evolution** Bald Mountain, Providence Catchment Forests (C. Riebe, W.J. Hahm, R. Bales) *Start the day climbing Bald Mountain, an exposed granite peak in Sierra National Forest. Learn about the differences in granite mineral composition that lead to divergent landscape evolution paths: Deep forest with maximum soil development or Exposed bedrock with minimal vegetative growth. Second stop will be in the Providence Creek catchments to explore dense forests with deep soils. Participants can stop to see several SSCZO installations. We will aim to have active displays of subsurface seismic surveys at Bald Mountain and at a transect of Providence Creek. Finally, the trip back to Tenaya will include stops at several road cuts to see the transition in soil development with descending elevation.*
90	5:00-6:30	Break
90	6:30-8:00	Dinner with Local natural history / historical talk
90	7:30-9:00	Optional: continuation of theme breakout discussions or alternate groups

Day 3 – Wednesday, Sept 24

Minutes	Time	Activity
60	7:00-8:00	Breakfast; *Load ppts onto computer & put up posters*
90	8:00-9:30	**Theme 4 – How can CZ understanding be used to enhance resilience and sustainability, and restore ecosystem function?** – Lead talk (15 min) – Short talks (6 x 5 min = 30 min) – Introduction to sub-themes (5 min) *How can we apply understanding of the Critical Zone to enhance ecosystem services and patterns such as: water resources, disturbance, ecological indicators, sustainability?*

		– Discussion (60 min)
90	9:30-11	Breakout groups – Additional work time
60	11:00-12:00	Breakout group - Wrap up discussions of next steps and develop summary document
150	12:00-2:30	Lunch Reports from breakout groups (5 min plus each plus brief discussion)
60	2:30-3:30	Parallel sessions – Administrative & implementation issues, NSF and CZO PI/Co-Is – Steering committee & visitors w/ young scientists
15	3:30-3:45	Meeting wrap-up comments
	3:45	First bus to Fresno airport
45	3:45-4:30	Follow-up breakout meetings – CZO PI discussion – Time to work on products or outline papers
	4:45	Last bus to Fresno airport

Theme and breakout products. These will have tangible products, which may take different forms depending on maturity of current science and nature of the problem. Some suggestions:

a. outline a group paper
b. form an active Google group with an agenda
c. plan a follow-on workshop
d. plan a proposal
e. set up modeling target and means to achieve it
f. formulate research plan (e.g. tweaks to current monitoring that could yield integrative result, experiments that could be conducted)
g. plan a cyberseminar series

Theme and breakout possible leads (only some are confirmed **?=need to confirm attendance; *=can they commit to lead session?**)

Theme 1 – What controls CZ properties and processes?

Cliff Riebe
Suzanne Anderson*
Jon Pelletier
Sue Brantley*
Bill Dietrich*
Dan Richter*

Theme 2 – What is response of CZ structure, stores, and fluxes to climate?

Jon Chorover*
Steve Hart
Lou Derry*
Bill McDowell
Alain Plante*
Jen McIntosh
Asmeret Asefaw Berhe

Theme 3 – What is response of CZ structure, stores and fluxes to land use change?

Jon Pelletier*
Naomi Tague
Greg Barron-Gafford
Holly Barnard?
Kitty Lohse

Theme 4 – How can CZ understanding be used to enhance resilience and sustainability, and restore ecosystem function?

Martha Conklin
Thanos Papanicolaou*
Roger Bales
Bill McDowell*
Noah Molotch
Sheila Murphy
Paul Brooks*