CZO 2014 All Hands Meeting

Planning Agenda **Sept. 21-24, Fish Camp, CA**

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

Min	Time	Activity
30	4:00-7:00	Registration; *Informal discussions, sign up for field trips, hang 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 topics below 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

Min	Time	Activity
60	7:00-8:00	Breakfast; Load ppts onto computer and hang posters
40	8:00-8:40	Introduction to meeting – Roger – SSCZO welcome & outline meeting aims (10 min) – *Quick round the room names:* 170 people @ 10 s/person = 28 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 – Roger Bales Find ways to move forward on cross-site science & products
30	9:45-10:15	International CZO Discussion & Report on meeting in China – Chen Zhu, Steve Banwart & Whendee Silver
30	10:15-10:45	Break & poster viewing
90	10:45-12:15	**Theme 1 – What controls CZ properties and processes?** – Introduction to target questions underlying Theme 1 (5 min) – Cliff Riebe a. *How does critical zone development depend on lithology and geologic legacy?* b. *How does critical zone development vary with climate?* *c. How does biota influence critical zone development?* d. *How does hillslope aspect, as it influences local climate, affect critical zone evolution and structure?* – Four (8 min) talks, pertaining to the theme *Toward an energy-driven model for CZ development (Pelletier)* *Toward a mechanical processes-driven model for CZ development (Dietrich)* *Toward a chemical processes-driven model for CZ development (Brantley)* *Natural experiments to test models: knickpoints, aspect, drill the ridge, more (S Anderson)* – Discussion (45 min)
75	12:15-1:30	Lunch, with a talk on Ecosystem Services – Paul Sutton
90	1:30-3:00	**Theme 2 – What is response of CZ structure, stores, and fluxes to climate?** – Introduction to target questions underlying Theme 2 (5 min) – Jon Chorover – Five (8 min) talks, one pertaining to each of the five questions. a. *How do material & energy fluxes across boundaries relate to climate? (McIntosh et al.)* b. *Especially on shorter time scales, what controls biogeochemical stores and fluxes within the CZ? (Berhe et al.)* c. *What factors moderate soil-organic carbon relationships in shallow and deep soil? (Wenell et al.)* d. *How do microbial communities (activity, composition) influence biogeochemical stores and*

		fluxes? (Plante et al.) e. *What is the relationship between concentration & discharge? (Derry and Aguirre)* – Discussion (35 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?** – Intro talks (12 min each, 25 total) – Lejo Flores and Paul Brooks – Poster presenters have 30 seconds to introduce themselves and their poster (9 min) – Introduction to sub-themes (15 min total) *a. How does the CZ respond to climate change & land-use/management effects? (Pelletier)* *b. How does regolith affect vegetation? (Lohse)* *c. How do (bi-directional) vegetation-regolith dynamics influence CZ structure, stores & fluxes, including water & C? (Barron-Gafford)* *d. How do material and energy fluxes across boundaries relate to land use change? (Tague)* – Discussion (41 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

Min	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 ~45 spots	**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 ~120 spots	**New advances in the long-studied elevational transect of the western Sierra Nevada** Stop 1: Drought-dust interactions; soil evolution at the catena level (E. Aronson, T. O'Geen) Stop 2: Vegetation-atmosphere interactions, Providence Catchment (Lucas, Hartsough, Goulden, Stacy, Bales) Stop 3: Bedrock, vegetation and landscape evolution, Bald Mountain (C. Riebe, W.J. Hahm) *The Southern Sierra Critical Zone Observatory (SSCZO) is a community platform for research on critical-zone processes across the rain-snow transition, including 4 intensively instrumented sites spanning a ~2500 m elevation transect on the western slope of Sierra Nevada Mountains. The region is home to many benchmark studies by Hans Jenny, the renowned father of modern soil science. Building on benchmark work of Hans Jenny and many recent studies of the critical zone in the region, a major goal of SSCZO research is to understand how mountain soils and regolith develop over thousands to millions of years and how they will evolve in response to changes in climate and disturbance, including fire and human activity. This trip will stop at multiple SSCZO research sites, focusing on the foothill oak-pine woodlands and the mid-elevation mixed conifer forests and exposed granite peaks. In the foothills, participants will examine minimally developed soil profiles, discuss how soils vary across the transect, and discuss the impact of drought on vegetation, subsurface structure, and dust*

		inputs. At the more densely forested mid-elevation site, participants will explore interactions among regolith development, forest productivity, and evapotranspiration that persist through summer dry periods and wet winter months. Between the lower elevations, where productivity shuts down in summer dry periods, and the higher elevations, which suffer from winter cold limitation, there is a sweet spot for forest growth that persists through every season. Yet these highly productive forests are juxtaposed at geologic contacts by bare rock, including Bald Mountain, a prominent outcropping of granite where participants will gather for a third stop. Topics at this stop will include lithologic controls on vegetation, near-surface geophysics, and an overview of landscape evolution in the region.
90	5:00-6:30	Break
90	6:30-8:00	Dinner
90	7:30-9:00	Optional: continuation of theme breakout discussions or alternate groups

Day 3 – Wednesday, Sept 24

Min	Time	Activity
60	7:00-8:00	Breakfast; *Load ppts onto computer* Meeting time for Steering Committee with NSF program officers
90	8:00-9:30	**Theme 4 – How can CZ understanding be used to enhance resilience and sustainability, and restore ecosystem function?** *How can we apply understanding of the Critical Zone to enhance ecosystem services and patterns such as: water resources, disturbance, ecological indicators, sustainability?* – Keynote (15 min) **Resilience and sustainability: lessons from SoilTrec** - Steve Banwart – Four (10 min) contributed talks pertaining to subthemes a. ***The Critical Zone and natural capital:*** *Natural capital and ecosystem evaluation – Sierra Nevada examples (Conklin and Bales)* b. ***The Critical Zone and sustainable water resources:*** *Alterations to forest-snow feedbacks after insect-related disturbance (Molotch)* c. ***Maintaining the Critical Zone in managed landscapes:*** *Implications of water and sediment sources for maintaining the Critical Zone (Karwan)* d. ***Linking Critical Zone function to ecosystem integrity and ecosystem services*** *Linking Critical Zone currencies to river ecosystem states (Power)* – Discussion (35 min)
30	9:30 -10	CZOData Presentation and Showcase (20 min, 10 min Q&A) – Anthony Aufdenkampe
120	10:00-12:00	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	– Steering committee report to the CZO group (plus discussion)
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 leads (***=Primary session leader**)

Theme 1 – What controls CZ properties and processes?

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

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

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

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

Greg Barron-Gafford
Kitty Lohse
Jon Pelletier*
Naomi Tague

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

Roger Bales
Steve Banwart
Paul Brooks
Martha Conklin
Bill McDowell*
Noah Molotch
Mary Power*