Theme 1: **What controls CZ properties and processes?**

1. *How does the critical zone development depend on lithology and geologic legacy?*
2. *How does critical zone development vary with climate?*
3. *What is the role of microbes deep in the critical zone in mediating solute evolution of runoff water and carbon processing?*
4. *How does hillslope aspect, as it influences local climate, affect critical zone evolution and structure?*

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| Addressing a particular CZO, site, breakout group, or working group: | | |
| Questions | Key Findings | Methods & Tools  (infrastructure, measurements, models) |
|  |  |  |

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

* 1. *What is the relationship between concentration & discharge?*
  2. *What factors moderate soil-organic carbon relationships in shallow and deep soil?*
  3. *How do material & energy fluxes across boundaries relate to climate?*
  4. *Especially on shorter time scales, what controls biogeochemical stores and fluxes within the CZ?*
  5. *How do microbial communities (activity, composition) influence biogeochemical stores and fluxes?*

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| Addressing a particular CZO, site, breakout group, or working group: | | |
| Questions | Key Findings | Methods & Tools  (infrastructure, measurements, models) |
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**Theme 3: What is response of CZ structure, stores and fluxes to land use change?**

1. *How does the CZ respond to climate change & land-use/management effects?*
2. *How does regolith affect vegetation?*
3. *How do (bi-direction) vegetation-regolith dynamics influence CZ structure, stores & fluxes, including water & C?*
4. *How do material and energy fluxes across boundaries relate to land use change?*

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| Addressing a particular CZO, site, breakout group, or working group: | | |
| Questions | Key Findings | Methods & Tools  (infrastructure, measurements, models) |
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**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, or sustainability?*

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| Addressing a particular CZO, site, breakout group, or working group: **SOUTHERN SIERRA CZO** | | |
| Questions | Key Findings | Methods & Tools  (infrastructure, measurements, models) |
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To be paired with each form, as a breakout group or CZO team fills it out:

|  |  |  |
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| Cross-CZO Opportunities | | |
| Similar Questions | Comparable Measurements | Synthesis Opportunities |
|  |  | Additional measurements: |
| Funding: |
| Working Group Opportunities |