**DAY 35: Mon Nov 14** CAVE BEAR cont stable isotopes

1. **10:00-10:08 Business—**
   1. Project backgrounds – should be done today—draft of some pointers for you that I’ll keep working on will be up on Moodle, SIGN UP FOR A MEETING if you want to go over your background/project and/or think you might need to turn your description in after break.
   2. **Thursday**, your project description is due. Don’t need to bring a copy for peer editing this time.
   3. Don’t forget to put your completed message box in the folder today!
2. **10:08-10:30 continue from Friday (which MAIN bulleted point or new points do these figures/tables represent)** 
   1. Figure 4—how to verify signature of diet items is unique
   2. Fig 5—effects of atmospheric CO2 over time
3. **10:30-10:48** Results section using your charts for each isotope in the results answer these questions

Diagenesis: "*the cumulative physical, chemical and biological environment; these processes will modify an organic object’s original chemical and/or structural properties and will govern its ultimate fate, in terms of preservation or destruction*" (Wilson and Pollard, 2002

* 1. They argue that they can identify differences in water resources used by the bears. What isotopic measurement can they take in the **ancient bears** that will reflect the water resource the bears were using?
     1. **NOT** δ18OH20 in ancient bears it is δ18Ocarb
  2. They argue that they can use the δ18Ovalues basedon the carbonate fraction and don’t need to use the δ18OPO4 Why are the carbonate values good enough?
     1. The phosphate and carbonate values show the same trend and they don’t show any diagenetic indicators, so they’re good to go
  3. They say “no significant correlation was found between the isotopic values and any diagenetic indicator.” **What are the diagenetic indicators they were looking for?**
     1. Testing different correlations between markers, such as N content of whole bone that reflects the intensity of collagen loss or the percent carbonate in the bone (percent carbonate in ancient bones was 5.6 to 8.3% compared to 7.8% in modern bones)
     2. Difference between two sources of oxygen, that in carbonate and that in phosphate, were compared to that in modern mammal bones and was found to be similar (Oxygen laid down in carbonate and in phosphate comes from the same source, you expect the difference to be the same, because the discrimination in bone formation is the same—if you see a difference, then collagen has probably been destroyed

1. **10:48 Cave Bear Activity 1:** Message Box *What are the questions we are trying to answer?*
   1. Were all cave bears herbivorous when they co-occurred? THEY THOUGHT ABOUT THIS, NEED MORE TIME ON IT
   2. When they lived together for significant periods, did they partition their ecological niches?
   3. How flexible were the dietary habits of cave bears in relation to individual choices and phylogenetic affiliation?
   4. Is there a link between the occurrence of different cave bear types and climatic fluctuations?
2. **10:08-10:15 Cave Bear Activity 1:** Discussion
   1. Write U.spelaeus eremus and U.ingressus and U. arctos on your board
      1. Write under the two cave bears which one was physically bigger, For all 3: which one lived in the higher altitude cave and which in the lower altitude cave, For all 3 species: which was herbivorous, omnivorous and/or carnivorous
      2. Now write up Ramesch and Gamssulzen and write: high altitude or lower altitude under each
3. **10:15-10:45** Write the 4 big questions and their answers up on the board. Write down which figure supports each one
4. **10:45-10:50 Discuss answers and grade**

**THEIR PREP: Finish their project description**

**READ:**

Bocherens, Hervé, et al. "Niche partitioning between two sympatric genetically distinct cave bears (< i> Ursus spelaeus</i> and< i> Ursus ingressus)</i> and brown bear (< i> Ursus arctos</i>) from Austria: Isotopic evidence from fossil bones." *Quaternary International* 245.2 (2011): 238-248.

**MY PREP:**

* Team folders
  + Blank Message Box for each student
* Reading guide
* Grade their project backgrounds