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**National Climate Assessment- Agriculture Investigation- Scavenger Hunt worksheet**

Navigate to <http://nca2014.globalchange.gov/> to find the answers to the following questions:

Part 1: Why should we care about climate change? One reason is that it’s already having adverse impacts on human health, in addition to the natural environment!

1. Go to the “Human Health” page under “Sectors.” What are some ways that climate change impacts human health?
2. Stay on the Human Health page. Why might climate change cause increased asthma rates?

Part 2: How does climate change impact U.S. agriculture?

1. Go to the “Agriculture” page under “Sectors.” What is the value that the U.S. produces each year in agricultural commodities (crops, livestock, etc)?
2. How is this value threatened by climate change?
3. How does the agricultural sector continually adapt to climate change?
4. Using Figure 6.2- Agricultural Distribution, how many milk cows are there in the United States? In which state are most of them located?
5. Using Figure 6.2 again, choose another metric from the list and state how many of the animal/crop exist in the U.S., and which state(s) they are most populous in.
6. What is the effect of elevated carbon dioxide levels on fruit and grain crops?
7. Interact with Figure 6.6. What has happened to the number of chilling hours in California from 1950 to the present? Why are chilling hours important for crops (consult outside sources if necessary)?
8. According to Key Message 3 in the Agriculture sector, what are 3 characteristics of productive soils?
9. After reading Key Message 5, propose 2 reasons why increased pesticide application to combat pressure from pests might not be a good adaptation measure for a farmer to employ (you may use outside sources for this question, but cite them in your answer). Think about- do we use pesticides on our school garden? Why or why not?

Part 3: How is climate change impacting agriculture in our geographic region?

1. How much higher have temperatures risen in recent decades compared to historical averages in your region?
2. List several of the projected impacts on agriculture for your region.
3. Why does it matter if we can no longer accurately predict or know when to expect seasonal occurrences like snowmelt and precipitation patterns?
4. Interact with the different sections about your region. Which predicted impacts are you most concerned about personally, and why?

Extension/Bonus question: In your own words, how does what we’re doing out in the school garden relate to climate change?

Answer Key:

1. Increased extreme weather events (floods, hurricanes, droughts), wildfires, increased pest and disease transmittance (from mosquitos and ticks), decreased air quality, threats to mental health, food- and water-borne illness
2. Due to more air pollution from cars, power plants, etc. as well as wildfires and extreme temperatures.
3. $330 billion
4. Increasing pests, weeds, and crop/livestock disease due to changing weather patterns (warmer temps keep these things alive), extreme weather events, changing climate patterns affecting crop viability and phenology
5. Change in crop rotation, planting times, genetic selection (of seeds), fertilizer/pesticide management, water management, and shifts in areas of crop production (i.e. planting things further north as temps warm). ALSO, by storing more carbon in the soil and building SOM!
6. 9.266 million; CA
7. Answers vary
8. Mixed effects, hard to predict interaction with other variables such as temperature, precipitation, and air pollution, but in isolation CO2 can have an elevated growing effect on crops.
9. Chilling hours have decreased from 1950 to present. Chilling hours are important because they allow certain fruit and nut tress to go dormant, and important part of crop life cycle allowing it to bloom again in spring.
10. High organic matter, healthy microbial community, nutrient levels necessary for production of healthy plants, soil structure with good binding of primary materials, moderate pH levels, adequate water holding capacity
11. Bad idea because of energy requirements for fertilizer production, and ecosystem degradation from pesticide runoff from agricultural lands (pollutes rivers and causes eutrophication)
12. SW: 2 F; NW: 1.3 F
13. Answers vary
14. Answers vary
15. Answers vary