**NASA DEVELOP National Program**

****NASA Langley Research Center

**Spring 2015**

**Virtual Poster Session Wave 1 Submission**

**DEVELOP Short Title:** Northwest US Agriculture II

**Team Location:** Langley Research Center – Hampton, Virginia

**Project Lead & Email:** Lydia Cuker, lydia.p.cuker@nasa.gov

**VPS Title:** Just Chill for an Hour: Mapping Suitable Apple Growing Regions in Washington Based on Accumulated Chill Units

**Image: *We don’t have an image yet but will get one to you as soon as we have something to show.***

**Caption:** ***TBD once we have an image.***

**Squib:** (max 50 words)

Washington may not be the largest apple producing state in the US for much longer. If temperatures rise too high in coming years, present-day apple orchards in Washington may not spend enough time “chilling” to subsequently produce a bountiful yield. See how NASA Earth observations can help save the apples!

**Video Style:**

***Federal Video Resources***

NASA Scientific Visualization Studio: <http://svs.gsfc.nasa.gov/>

USGS B-Roll Gallery: <http://gallery.usgs.gov/video_sets/B-Roll>

Additional resources available at: <https://docs.google.com/spreadsheets/d/1e2mQXg4wcYsubINUA6RNQdLwa3udqczxGx-RbD2xSeI/edit?usp=sharing>

Anyone with the link can edit this document, so please add any other federal resources you find!

The video will be styled as a documentary exposing the little known dangers that lurk for the apples of Washington. We will start with why Washington is currently such an ideal place to cultivate apples and then move on to how increased temperatures may threaten their continued ability to thrive. This could cripple the Washington apple industry if they are not prepared to accommodate the changes that Mother Nature – climate change – is setting up to hurl at the state. Visually, the video will have a mix of static images and video of apples, orchards, aspects of apple production, and scenes depicting possible future scenarios due to climate change. Maps of the region and NASA Earth observation data will also be incorporated.

**Things to include in the video, other than the lead in and closing clips, the order of inclusion is entirely up to the team:**

Mandatory Lead in: DEVELOP Intro clip (available on the Exchange at: Start > Earthzine – Virtual Poster Sessions > Video Opening & Closing Clips)

Video Opening: description

Community Concerns:

* With impending climate fluctuations, temperature ranges will change in Washington, resulting in possible negative impacts on apple harvests.
* If winter temperatures rise there could be a reduction in accumulated chill hours for locations where apples are currently grown, which could negatively affect the apple trees’ dormancy and spring bloom
* If summer temperatures increase, the demand for irrigation resources may expand, which could raise the cost of apple production.

Collaborators & End-Users:

* Project Partner: Dr. Michael Glenn of the United States Department of Agriculture Appalachian Fruit Research Station in Kearneysville, West Virginia.
* End Users: Apple orchard growers and owners who operate and manage apple production in Washington

How will Participants be Introduced:

Participants will be introduced when they do their portion of the voiceover. A lead-in video of each participant will precede the topic that they will discuss.

Data Usage:

* Aqua and Terra, MODIS – Land Surface Temperature, 2003 – 2013
* National Oceanic and Atmospheric Association Ground Weather Station – Hourly Air Temperature, 2003 – 2013

Analysis:

From the calculation of accumulated chill units experienced under current conditions, forecasted accumulated chill units for the region were calculated.  The projected changes in maximum and minimum air temperatures were combined with the respective corresponding MODIS data for each day and the newly calculated temperatures were entered into the Utah Model then summed for accumulated chill units for each 2045 and 2065.  The results of each of these applications were mapped with delineations for suitable apple growing areas.

Results:

* Final Results: Three maps of accumulated chill hours for Washington
  + Current Accumulated Chill Hours Map
  + 2045 Forecasted Accumulated Chill Hours Map
  + 2065 Forecasted Accumulated Chill Hours Map
* Discussion of Results: TBD (We will have something to say once we see the results)

Benefits:

* Calculations of accumulated chill units will give growers a better understanding of how apple production may be impacted by climate change.
* Forecasted trends in accumulated chill units can aid apple growers prepare for impending climate change by informing the growers of could happen. This can assist growers in modifying their production processes for a more fruitful yield in years to come.

Mandatory Video Closing: DEVELOP closing clip (available on the Exchange at: Start > Earthzine – Virtual Poster Sessions > Video Opening & Closing Clips)