Potential Projection Method
Agriculture Workgroup March, 2013

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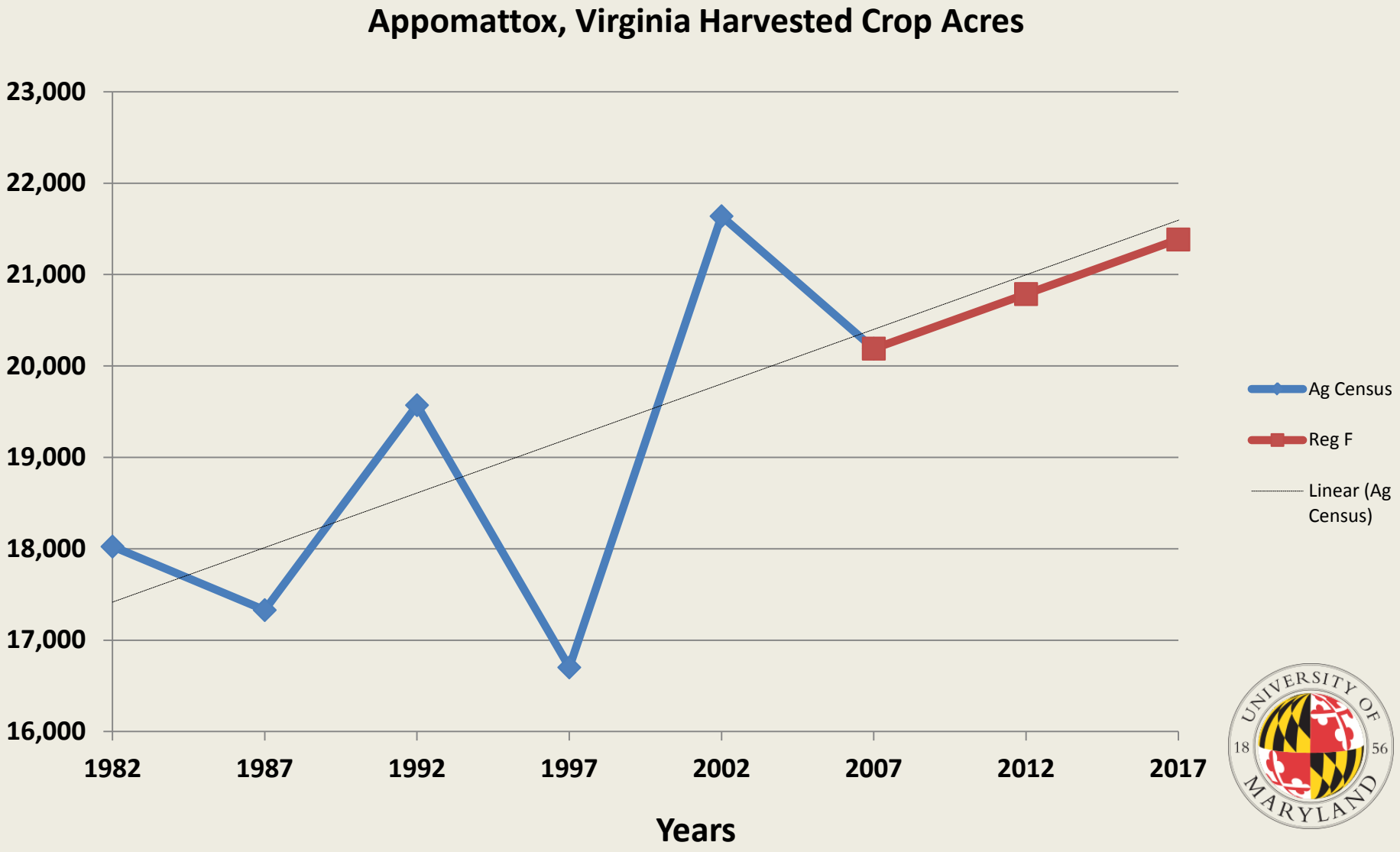
Current Needs/Plans

- The Milestones Workgroup is requesting a 2014 and 2015 projected set of land uses, crops and animals by this summer.
- Many research projects require projections into the future.
- CBP does NOT currently plan to project to 2025 for a re-evaluation of the TMDL.

Current Projection Method

- For any crop or animal type in County X, we calculate a long-term trend from the Agricultural Census using 1982 through 2007 data. Data is available every five years.
- To estimate 2008, the slope of the long-term trend is added to the 2007 Agricultural Census number. This trend is then also applied to determine 2009, 2010, and so on.

What this looks like



What We Have Heard

- 1982 has little effect upon 2008.
- Trends in agriculture change for a variety of reasons including: economic trends; state regulations; land retirement and acquisitions, etc.
- We should emphasize the most recent data available (2007) to predict future data.

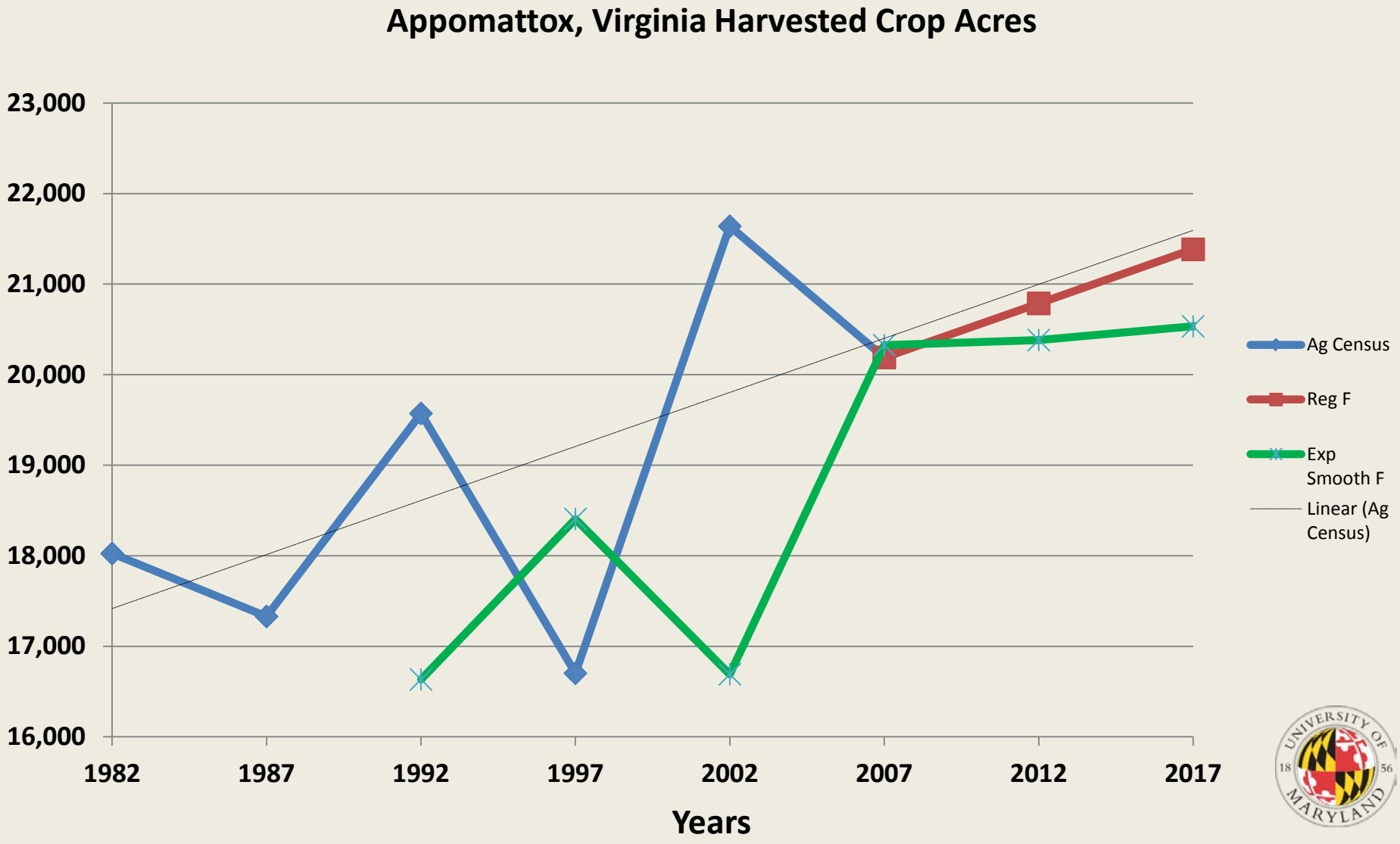
The Answer to All our Problems?

- Double Exponential Smoothing
  - This is a sophisticated projection method used often by market and business analysts.
  - The method assumes the following: 1) The most recent data has more of an effect on the future than previous data; and 2) There is some sort of long-term trend in the data.
  - If we assume both 1 and 2 above, we can then assign relative importance (from 0 to 1) to both of these variables (the most recent data's effect and the long-term trend).

Example

- For harvested crop acres in County X, we assume that the 2007 Agricultural Census data has a significant impact on the 2008 data. We will weight the 2007 data's impact as high.
- For harvested crop acres in County X, we assume that there is a long-term trend between 1982 and 2007 Agricultural Census data. While we assume this long-term trend has SOME effect on the harvested crop acres in 2008, we don't believe the effect is very important. We will weight this trend's impact as low.

What this looks like



Advantages

- Allows us to “deflate” the long-term trend that may otherwise drive our data very high or very low in future projections.
- Allows us to “emphasize” the most recent data (2007).
- Gives managers clear expectations for future years.
- 2012 Agricultural Census will have much greater impact on projections than with the current method.

Disadvantages

- This is a projection.
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- Future projections will still be based on a straight line slope (albeit a deflated one).
- Some data for some counties may NOT have a clear long-term trend (we have this same problem with the current projection method).
- Large fluctuations in a five-year period will significantly impact future projections.

Decision Requested

Question: What projection method should the Chesapeake Bay Program use for to project for the 2015 Milestones (and other projects)?

Options:

1) Use the current, straight line projection.

2) Use the proposed double-exponential smoothing method.

3) Use a different method not yet identified or analyzed. If this option is chosen, the Agriculture Workgroup would need to identify other methods for analysis. A decision on the final method would still be needed by early summer, 2013.