



# A Potential Method for Integrating and Scaling PINEMAP Research

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Science Presentation

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## **Givens**

The economic models work well with percent changes to growth

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The productivity models can provide various forms of output, but any of these outputs can be converted into a percent growth change if compared to a business as usual baseline.



## Method

- 1) Establish a baseline set of years (e.g., 1950 – 2000).
  - 2) Run the productivity models over this baseline time period to establish a spatially explicit, baseline productivity value (e.g., GPP, NPP, GEP).
  - 3) Establish a climate scenario period (e.g. 2001 to 2050).
  - 4) Run the productivity models over this scenario period to derive a second set of spatially explicit productivity values.
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## Method cont.

- 5) Divide the spatially explicit annual scenario productivity value by the baseline value to generate a percentage change.
  - 6) Provide the spatially explicit map of percentage change productivity values to the economics group in CVS format.
  - 7) Combine the climate scenario run with one or more of the other factors outline below to examine multiple factors impacts.
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## Advantages to method

- 1) Direct. No added error by converting units (e.g. GEP to cords, MBF or tons).
  - 2) Simple. The entire region can be generated from a single run (That is how we generated the WaSSI runs I presented).
  - 3) Point based (e.g. G&Y) can be directly compared to spatially continuous models (e.g. WaSSI)
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- 4) Biological model runs would be done a priori to the economic runs and thus greatly simplify the problem of data exchange between models (actually a trick we used with the PnET/SRTS work).



5) **Integrated scenarios can be done in a single run in conjunction with climate change.**

- a. For example, WaSSI
  - i. Genetic improvements – increase WUE
  - ii. Fertilization – increase LAI
  - iii. Silvicultural improvement – increase LAI
  - iv. Young age class – reduce LAI
  - v. Ozone – reduce LAI or decrease WUE
  - vi. N deposition – Increase LAI

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In each case, the entire range would be run as a single coverage (as with baseline and climate change scenarios). Then the integrated scenario productivity estimates would be divided by the baseline and to create growth ratios for the economic models. Lastly, a secondary overlay corresponding to the factor range would be used as a mask, and converted into a CVS for the economic models.



Thoughts?

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