Modeling Capacity to Meet Food Needs through Local and Regional Production Systems

An Open Forum to Strengthen Collaborations between Research, Outreach, and Education for the Northeast Food System

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Past funding

"Mapping Local Food Systems Potential in New York State" USDA National Research Initiative [Grant No. 2005-55618-15640], 7/1/2005 to 6/30/2008

Outline

1. Introduction to modeling
2. Research on production capacity
    a. Land requirements of diet
    b. Potential foodsheds
    c. Integrated modeling
3. Relevance to outreach and education

A few words on modeling

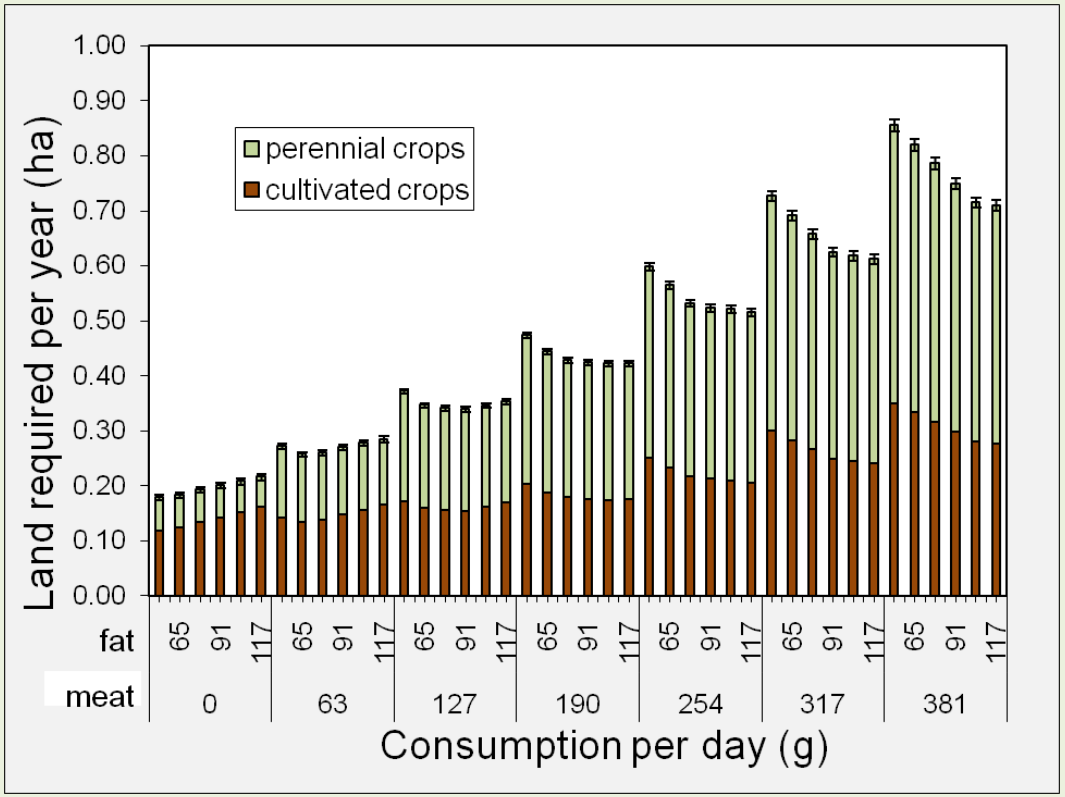
What are models?

- Simplifications of reality
- Always wrong, sometimes useful
- Take many forms
  - Mental models
  - Statistical models
  - Computer models

Why use models?

- Two major purposes
  - Making predictions
  - Understanding systems
- For food systems
  - Too big to experiment
  - Explore outside range of observed experience
  - Make “virtual” mistakes

Foodprints and Foodsheds Project
Land requirements of diet



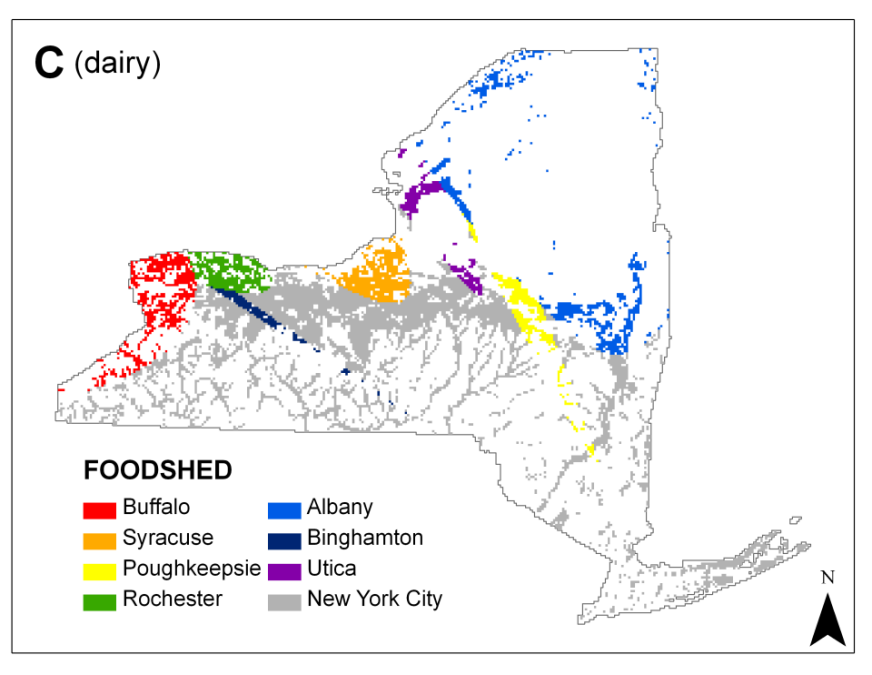
Peters, C.J., J.L. Wilkins, and G.W. Fick. 2007. Testing a complete-diet model for estimating the land resource requirements of food consumption and agricultural carrying capacity: The New York State example. *Renewable Agriculture and Food Systems* 22(2): 145-153.

FOODPRINT

1. **Spreadsheet model**
   - Land requirements
   - Carrying capacity
2. **Approach:**
   - Intake
   - Losses and conversions
   - Livestock feed
   - Crop yields
   - Land availability
3. **Geography**
   - NY done
   - Conterminous U.S.
   - MI, MS, and NM

Foodprints and Foodsheds Project

Mapping potential foodsheds



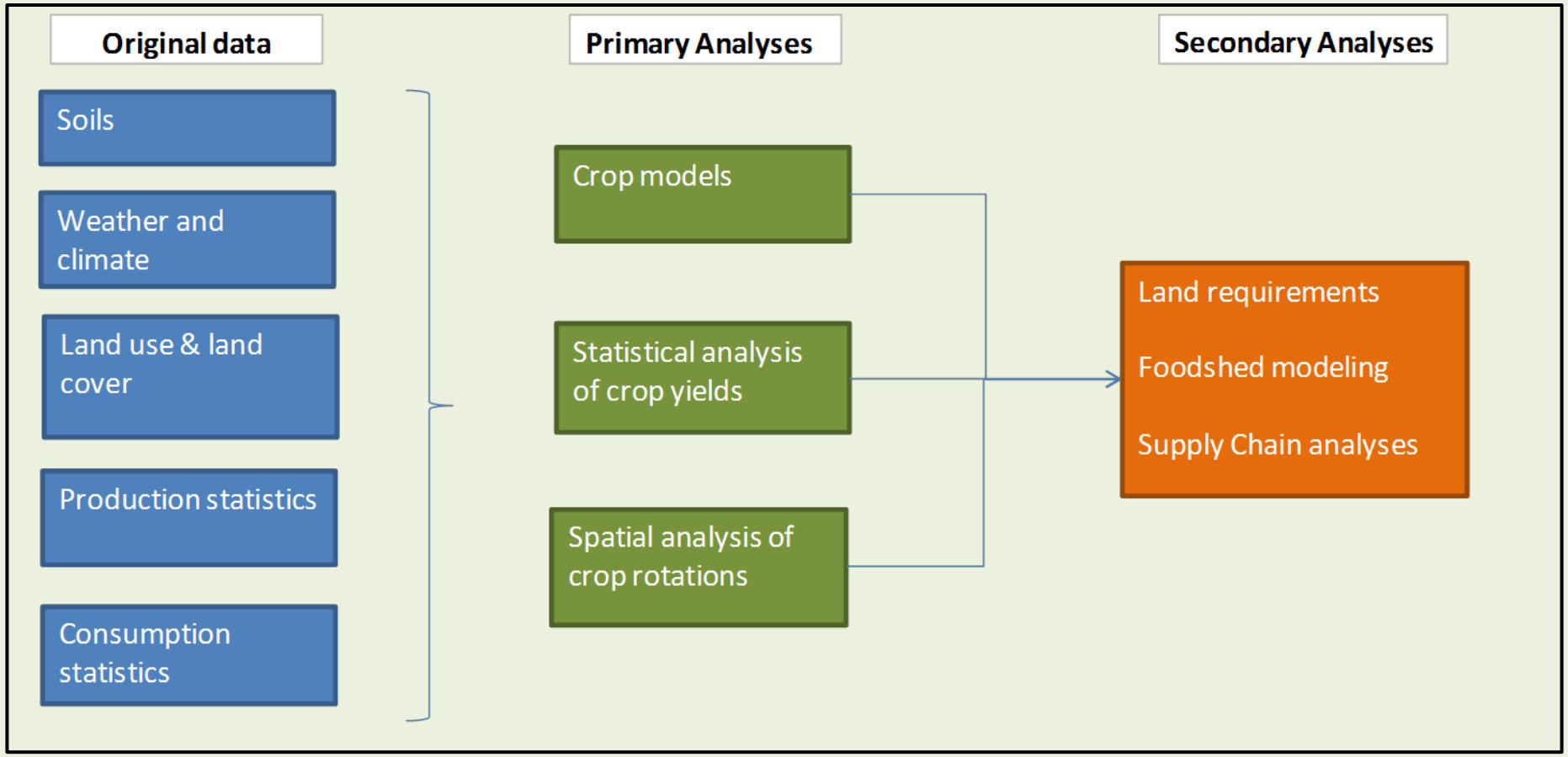
Peters, C.J., Bills, N.L., Lembo, A.J., Wilkins, J.L., and Fick, G.W. 2012. Mapping potential foodsheds in New York State by food group: An approach for prioritizing which foods to grow locally. *Renewable Agriculture and Food Systems* 27(2): 125-137.

FOODSHED

1. **Hybrid model**
   - Spatial modeling
   - Optimization
2. **Output:**
   - Potential local foodsheds
   - Food distance
3. **Geography**
   - NY done
   - Conterminous U.S.
   - MI, MS, and NM

EFSNE Project

Integrated modeling framework



SOURCE: *unpublished* data from Production Team of "Enhancing Food Security with Sustainable Regional Food Systems" Project [Grant No. 2011-68004-30057]

Relevance to outreach and education

Outreach

- Workshops with stakeholders
- Multiple locations (NY, MI, NM, MS)
- Topical working groups in Northeast

Education

- Used in classroom
- Interface to enter user-defined diets