Forest Assessments:
Use of Storylines and Scenarios

David Wear
U.S. Forest Service Research & Development
Objective

- Provide context for next session’s question:
  - What is needed to construct story lines and scenarios
- Examine the use of storylines/scenarios in FS forest assessments
  - National: RPA Assessment
  - Regional:
    - Southern Forest Futures Project (2013)
      - National Forest planning
What is the SFFP?

- The Southern Forest Futures Project (SFFP) provides a science-based “futuring” analysis of the forests of the southeastern United States
  - Anticipating the future
  - Identifying concerns regarding forests and services
- The ultimate goal is to translate science findings into useable information for management planning and policy making
  - Not prescriptive
  - “information foundation” for policy
Approach

<table>
<thead>
<tr>
<th>Conduct public meetings, listen</th>
<th>Forecast of resource conditions and uses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Define the Questions</strong></td>
<td><strong>Forecasting Analysis</strong></td>
</tr>
<tr>
<td>Agency commitment, recruit teams</td>
<td>Implications for various ecosystem services</td>
</tr>
<tr>
<td><strong>Organize resources</strong></td>
<td><strong>Meta-Issue Analysis</strong></td>
</tr>
<tr>
<td>Develop plans, conduct public review</td>
<td>Management and restoration implications</td>
</tr>
<tr>
<td><strong>Develop plan</strong></td>
<td><strong>Subregional Analysis</strong></td>
</tr>
</tbody>
</table>
National versus regional

**Southern Forest Futures Project**
- Bottom-up
- Question-driven
- Episodic
- Off-the shelf
- Science synthesis
- Immediacy
- Specific questions and places
- Managers and local ngos, policy

**RPA**
- Top-down
- Legislative mandate
- Cyclical
- Method development
- Science program
- Long view
- Broad questions and scale
- National policy audience

...but consistency is needed
Selection of scenarios-SFFP

- Needed to select scenarios based on questions
  - Defining a representative span of future forest/land use conditions
  - Rather than full span of socioeconomic/climate conditions (focus wasn’t on drivers per se)

- Scenarios address an audience
  - Plausibility
  - Credibility
  - Manageability
## 2010 RPA Scenarios - Socioeconomic Linkages

### Linked to International Context through IPCC SRES

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Scenario RPA A1B</th>
<th>Scenario RPA A2</th>
<th>Scenario RPA B2</th>
<th>Scenario RPA HFW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Real GDP Growth (2010-2060)</td>
<td>High (6.2X)</td>
<td>Low (3.2X)</td>
<td>Medium (3.5X)</td>
<td>High (6.2X)</td>
</tr>
<tr>
<td>Global Population Growth (2010-2060)</td>
<td>Medium (1.3X)</td>
<td>High (1.7X)</td>
<td>Medium (1.4X)</td>
<td>Medium (1.3X)</td>
</tr>
<tr>
<td>Global Expansion of Primary Biomass Energy Production</td>
<td>High</td>
<td>Medium</td>
<td>Medium</td>
<td>Fuelwood demand follows historical trends in all countries</td>
</tr>
</tbody>
</table>

### U.S. national projections scaled to county

<table>
<thead>
<tr>
<th></th>
<th>Scenario RPA A1B</th>
<th>Scenario RPA A2</th>
<th>Scenario RPA B2</th>
<th>Scenario RPA HFW</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. GDP Growth (2006-2060)</td>
<td>Medium (3.3X)</td>
<td>Low (2.6X)</td>
<td>Low (2.2X)</td>
<td>High (3.3X)</td>
</tr>
<tr>
<td>U.S. Population Growth (2006-2060)</td>
<td>Medium (1.5X)</td>
<td>High (1.7X)</td>
<td>Low (1.3X)</td>
<td>Medium (1.5X)</td>
</tr>
<tr>
<td>Expansion of U.S. Wood Fuel Feedstock (2006-2060)</td>
<td>High (15.7X)</td>
<td>Medium (9.4X)</td>
<td>Low (3.7X)</td>
<td>Historical (1.6X)</td>
</tr>
</tbody>
</table>
2010 RPA Models and Scenario Analysis: Forests

Global SRES Scenarios from IPCC reports

- Socioeconomic Variables
- Bioenergy Projections
- Climate Projections

Translation / Downscaling

Domestic Macroeconomics and Demographics Forecasts

Global Forest Products Model

US Forest Products Model

Forest Dynamics Model

Land Use Model

Timber supply

Forest area supply

Projected Wood Products and Timber Outputs and prices

- Carbon Accounting
- Ecosystem Services: Wildlife, Water, Recreation, Forage
- Landscape Structure

Projected Forest Conditions and Land Use
Scenario winnowing for SFFP

• From RPA:
  – Population
  – Income
  – Climate

• Factorial analysis:
  – Timber prices
    • bioenergy
  – Forest planting intensities
Cornerstone Futures

- Alternative futures defined by coherent scenarios (linked to RPA):
  - Population/income forecasts
  - Climate forecasts
  - Product market futures
  - Tree planting intensities
Lessons Learned

- 2010 RPA Assessment
  - Using IPCC linkage worked well to ensure both globally and nationally consistent assumptions that linked socioeconomic and atmospheric drivers of change on natural resources.
  - Traditional RPA audiences didn’t always identify with “equally likely scenarios, as opposed to comparisons to a “business as usual” scenario.
  - Need to better communicate the use of scenarios to frame the RPA analysis, and to link more specific variations that resonate with various audiences of RPA.
  - How many scenarios?
    - Too many - difficult to deliver a take-home message
    - Too few scenarios: usually regarding the number of GCMs used
    - What’s just right? - Limited time and resources, potentially escalating number of scenarios
Lessons Learned - SFFP

- Professional/lay audiences find multiple scenarios difficult to consume.
  - Balancing comprehensive analysis against potential to inform perspectives of managers and policy makers

- Nesting a factorial approach within the SRES frame was useful
  - Addressed issues of immediate relevancy to audience
  - No unique downscaling from the SRES storylines
  - “What-if” nature resonated with audience
The global linkage to both climate and socioeconomic projections is important, but it’s not clear how we can make that linkage to IPCC – will SSPs provide the needed link?

Critical to be able to consistently aggregate across scales – from global to national and subnational scales.

Engagement/guidance on “what’s good enough” in the number of scenarios/climate projections used in resource analyses.

- Recent publications suggesting “all” climate projections need to be considered in analyses.
- Agency needs for considering other dimensions in their analyses that further complicates a determination on “what’s enough.”
- What are “usable” climate and socioeconomic projections that result in analyses that are both scientifically credible and useful for management?