Appendix 1: Crosswalk of Eastern Threat Center projects to problem areas and partners that highlights strategic implementation efforts

The Eastern Threat Center’s research work unit description provides a coarse overview of Center expertise, research objectives, and problem areas the Center addresses. These problem areas can be strategically addressed through a wide range of opportunities, and the Center is engaged in numerous, targeted research projects, partnerships, and initiatives.

The Center’s projects span multiple problem areas. Some projects focus more on monitoring (Problem Area 1) while others consume existing datasets for integrated assessment purposes or prediction (Problem Area 2). All primary projects include a substantial emphasis on exchange with end users (Problem Area 3), which helps to ensure that varied aspects of the Center’s applied science work are more clearly articulated and addressed. Interrelationships between the three problem areas and critical partnerships are outlined in Figure 1.

In Table 1, the Center’s primary projects are summarized according to critical partnerships and the nature of their work across the three Problem Areas. Center scientists are also involved with other projects that are related to these or in addition to these core efforts.

The Center’s communication and outreach efforts engage multiple audiences to achieve broad-based awareness of its research activities. Scientists and support staff regularly interact and partner with multiple Federal and state agencies, non-governmental organizations, universities, private organizations, Tribes, and other multicultural groups. These connections help expand and enhance understanding of the Center’s products and tools and also provide opportunities to engage with traditional and non-traditional customers and stakeholders.

Figure 1. Interrelationships among the Center’s three problem areas.
<table>
<thead>
<tr>
<th>Selected Eastern Threat Center Projects</th>
<th>Key Partners</th>
<th>Problem Area 1: Inventory and Monitoring</th>
<th>Problem Area 2: Applied Assessment and Prediction</th>
<th>Problem Area 3: Active Information Exchange</th>
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</thead>
<tbody>
<tr>
<td>Climate change effects on water (WASSI; <a href="http://www.forestthreats.org/research/tools/WaSSI">http://www.forestthreats.org/research/tools/WaSSI</a>)</td>
<td>Forest Service International Programs, USDA Regional Climate Hubs, universities, international partners</td>
<td>Create value-added monitoring products from existing climate and water datasets</td>
<td>Improve models for assessments of climate change impacts to water quality and quantity and how that relates to carbon sequestration</td>
<td>Engage water supply planners to identify where stress is likely to create conflicts in the future and how that may be mediated</td>
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<td>Comparative risk assessment for planning and management (CRAFT; <a href="http://craft.foresthreats.org">http://craft.foresthreats.org</a>)</td>
<td>University partners (UNCA-NEMAC), National Wildland Fire Cohesive Strategy Group</td>
<td>Derive value-added measures from existing datasets that can be used for risk assessment purposes</td>
<td>Use risk assessment tools, such as decision analysis and Bayesian Belief networks to identify critical tradeoffs, then address scenarios and management options to clarify how likely they are to be successful</td>
<td>Coordinate with local to national planners and policy makers to adopt tools that improve the quality of decisions</td>
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<td>Forest planning for climate change (TACCIMO; <a href="http://www.forestthreats.org/research/tools/taccimo">http://www.forestthreats.org/research/tools/taccimo</a>)</td>
<td>WWETAC, Forest Service National Forest System, USDA Regional Climate Hubs</td>
<td>Track the continuous flow of published information that relates to climate change to create value-added summaries and products</td>
<td>Evaluate the impacts of climate change for planning purposes with planners and other collaborators to ensure that the best information is being considered</td>
<td>Engage agency planning teams to bring critical climate change information to bear on related decisions</td>
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<td>Integrating Forest Health Monitoring (FHM) and Forest Inventory and Analysis (FIA) data</td>
<td>Forest Service FHM and FIA, NC State University</td>
<td>Derive and track value-added measures from FIA plot data to monitor forest health status</td>
<td>Integrate FIA and value added measures with other datasets to understand cause of change and to predict future conditions</td>
<td>Coordinate with forest health personnel and large scale forest planners and end users</td>
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<td>Mapping the future of southern pine management (PINEMAP; <a href="http://pinemap.org/">http://pinemap.org/</a>)</td>
<td>University partners (NC State University and others)</td>
<td>Monitor specific measures of change relevant to pine forests of the South</td>
<td>Build integrative models to predict climate change impacts and options</td>
<td>Work with the PINEMAP group and pine forest landowners to communicate options</td>
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<td>Selected Eastern Threat Center Projects</td>
<td>Key Partners</td>
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<td>Predicting woody plant range changes from climate change (FORECAST; [<a href="http://www.geobabble.org/~hnw/global/treeranges3/climate_change/">http://www.geobabble.org/~hnw/global/treeranges3/climate_change/</a>])</td>
<td>NC State University, DOE Oak Ridge National Lab</td>
<td>Derive value-added measures from existing datasets that can be used for species modeling</td>
<td>Integrate recent climate change models with FIA and other distribution data to predict coarse range change for species</td>
<td>Engage with planners seeking to prioritize species and to implement species adaptation plans</td>
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<tr>
<td>Quantifying risks from exotic plants</td>
<td>University partners</td>
<td>Track exotic plant occurrences by integrating available datasets</td>
<td>Model and predict constraints and controls on species distribution and potential</td>
<td>Improve policy and land managers’ knowledge of the most problematic invasives and how they can be managed and avoided</td>
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<tr>
<td>Quantifying risks from insects and diseases</td>
<td>Forest Service FHP and FHM, Canadian Forest Service, USDA APHIS, University partners</td>
<td>Integrate knowledge of pests in ways that inform assessment and predictions</td>
<td>Evaluate impacts from pests and predict their spread and impacts to values at risk</td>
<td>Coordinate with forest health personnel, large-scale forest planners, policymakers, and other end users</td>
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<td>Systematic monitoring and tracking of phenology, disturbance, and recovery from satellite data (ForWarn; [<a href="http://forwarn.forestthreats.org/">http://forwarn.forestthreats.org/</a>])</td>
<td>WWETAC, NASA-Stennis, USGS EROS Data Center, Oak Ridge National Lab, UNCA-NEMAC</td>
<td>Systematically monitor forest health conditions at high frequency and 240m resolution through the year; Derive value-added measures that can be tracked such as declining or increasing trends in evergreen, deciduous, or grass components</td>
<td>Interpret the causes of observed change using ancillary data at different time scales including long-term trends in relevant metrics; Identify change that is not expected and predict future recovery after disturbance</td>
<td>Coordinate with Forest Health monitoring personnel, landowners, and jurisdictions after change is observed; Engage with planners seeking tools for systematic coarse filter monitoring</td>
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<tr>
<td>Understanding landscape pattern change and forest fragmentation</td>
<td>Forest Service FIA, FHM, and R&amp;D QS, USGS, US EPA, European Commission Joint Research Centre, NC State University, National Park Service I&amp;M</td>
<td>Using NLCD and global land cover maps, periodically generate value added maps of landscape and forest patterns and trends</td>
<td>Address the causes of pattern change by bringing other datasets to bear in ways that can lead to systematic understanding</td>
<td>Communicate with large scale planners and other risk managers about landscape hazards and potential management prioritization</td>
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<tr>
<td>Area</td>
<td>Collaborators</td>
<td>Activities</td>
<td>Products/Outcomes</td>
<td>Outreach/Coordination</td>
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<td>Regional and national level wildland fire efforts</td>
<td>FPA, National and Regional Cohesive Strategy efforts, States</td>
<td>Value-added models of fire (e.g., Rx fire occurrence, monitoring fire hazards (ForWarn), hotspot clustering)</td>
<td>Integration of fire characterizations to address tradeoffs and predict long-term patterns (e.g., fire recovery, landscape dynamics and state transitions)</td>
<td>Workshops to fire decision makers (e.g., Cohesive Strategy, etc.)</td>
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<td>Species distribution/habitat modeling</td>
<td>FWS, tribes, LCCs, others</td>
<td>Multi-scale habitat characterization using big datasets, such as phenoregions, LiDAR, land cover data, etc.</td>
<td>Integration of habitats with other assessment products; Predicting outcomes with scenarios and simulations.</td>
<td>Outreach and coordination with targeted end-users</td>
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<td>Carbon productivity and management</td>
<td>Ameriflux</td>
<td>Eddy flux work, ForWarn’s productivity</td>
<td>Modeling evapotranspiration (WaSSI-LAI) use for assessments and predictions</td>
<td>Outreach to targeted end users, workshops</td>
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<tr>
<td>Understanding weather disturbances</td>
<td>Climate hubs, CSCs, USDA agriculture, NOAA NCDC</td>
<td>ForWarn weather event mapping and attribution, seasonal onset monitoring and prediction</td>
<td>Modeling attribution and effects</td>
<td>Climate hub, ForWarn website and derived products; Forest Health drought report</td>
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<tr>
<td>Large scale resiliency and conservation</td>
<td>LCCs, NFS, DOI, DoD, States</td>
<td>ForWarn state transitions, persistence, change; value-added big data integration, genetics mapping, cross-scale patch resilience</td>
<td>Integrated assessments using indicators (e.g., LCC work), State’s Forest Action Plans</td>
<td>Targeted outreach to agencies and entities</td>
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<tr>
<td>Urban forests</td>
<td>Urban areas</td>
<td>Urban landscape modeling, Hargrove-Edwards Urbanness Index, FIA urban data, urban stream management buffers</td>
<td>Modeling urban effects on seasonal changes in phenology, Urban pest risk mapping, integrating fire hazards and ignition in WUI, urban tree risk assessments</td>
<td>Targeted outreach to agencies and entities</td>
</tr>
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