



Template for Assessing Climate Change Impacts and Management Options: TACCIMO

Planning Under a Changing Climate

A USDA Forest Service Partnership Southern Research Station :: Forest Planning :: Forest Management :: Cooperative Forestry

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"As with any natural resource management issue [climate change], resource managers need access to current scientific information, qualitative/ quantitative tools to use in decision support analysis at forest and project planning levels, and management strategies to guide onthe-ground management." -- Joyce et al., SAP 4.4 (US Climate Change Science Program, 2008) "Action 1.1: Develop and implement internal mechanisms to ensure a systemic, interactive dialogue between researchers, public and private land and resource managers, and other users to promote effective climate change science delivery." -- US Forest Service Strategic Framework for Responding to Climate Change (USFS, 2008) "(1) Use the best available science on climate change that is relevant to the planning unit and the issues being considered in planning. (2) Where necessary to make informed decisions and provide planning direction responsive to changing climate, use climate change science and projections of change in temperature and precipitation patterns at the lowest geographic level (national, broad, mid-, base) that is scientifically defensible." --Climate Change Considerations in Land Management Plan Revisions (USFS, 2009)

TACCIMO Overview (Figure 1)

The Template for Assessing Climate Change Impacts and Management Options (TACCIMO) is a web-based tool that substantively connects (1) planning and (2) science through a (3) report generation service (Figure 1). TACCIMO provides land owners, managers, and planners with the best and most current climate change science available.

Planning

Forest planning will play an integral role in the effective management of forest resources under a changing climate. Connecting planning with emerging climate change science will enable planners and managers to effectively assess current management capabilities and to ensure sustainable forest resources meeting multiple demands.

Science (figure 2)

The TACCIMO inputs are (1) projected climate change, (2) literature review derived impacts and management options, and (3) USFS land and resource management plans. The web-based interface (4) uses a relational database environment to synthesize inputs based on user selections to generate a report. USFS forest planners will be able to readily construct a *Current Situation Report* (8) from the *Planning Template Report* (6), while state and private users will focus mainly on forecasts and impacts (5). Feedback tracking will ensure completeness of information and usefulness of functionalities (7).



Figure 1. The fundamental TACCIMO functions and concepts.



Figure 2. Conceptual Diagram depicting the inputs and outputs of the TACCIMO system with respect to user group.



Figure 3. Functional diagram of TACCIMO content relationships and user interfaces.

Projected Climate Change (4) is available through TACCIMO's geospatial interface, including temperature and precipitation forecasts in $1/8^{\circ}$ (~12km) resolution. Other relevant geospatial models (i.e. WaSSI) will be available through this interface. Users will be able to generate standard and custom maps, tables, and figures documenting the magnitude and direction of anticipate change for a given location. This information will serve as context for evaluating direct impacts and management options.

Land and Resource Management Plan (5) components (including forest wide desired conditions, objectives, design criteria, and monitoring questions) are stored in an easily updated database that will allow users to *connect climate change factors impacting ecosystems* directly with the planning language they are familiar with. Users will be able to directly link current management capabilities and conditions with emerging climate change science. This will aid planners, managers, and scientists in indentifying current management opportunties, potential limitations, and areas for future study.

The User Interface (6) will guide users through the TACCIMO report generation process. Users will begin by selecting factors impacting ecosystems relevant to their management focus. An interactions matrix will ensure that related factors will not be missed. Users will indentify relevant *direct impacts* and *management options* through geographic and subject matter filters. Users will have the opportunity to rank content based on multiple criteria (i.e. scope, severity, management opportunity, etc.). Next, users will explore geospatial content and produce standard and custom maps, figure and tables. Finally, users will export a report (7) documenting their selections, including supporting guidance from climate change experts.

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