SCT **Science Coordination Team**

Science for Sustainable Restoration

Science Strategy for Sustainable Restoration of the Greater Everglades and Coastal Ecosystems

Science has two essential supporting roles in the management and restoration of south Florida's natural and human systems:

- Research, including field studies and development of predictive models, which helps us understand how these natural systems work; and
- "Science application", the evaluation of research information and professional opinion, and the conversion of this information into formats for use by policy-makers and managers, which supports decision making, planning, and program management.

It is research that determines how and why natural and human systems are adversely altered as a result of human influences. Science application identifies and evaluates the potential pathways for correcting these stresses.

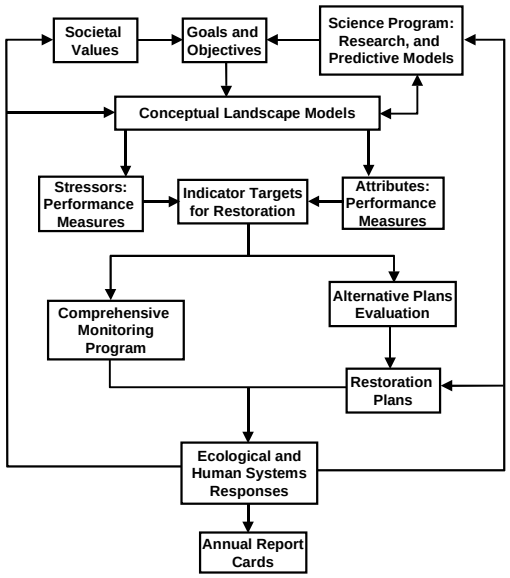
The south Florida science community, with input from the Science Coordination Team, has created a science application strategy as a process for organizing and focusing extensive technical information into planning and evaluation tools -- tools that directly support information needs related to sustainable restoration of south Florida's greater Everglades and coastal ecosystems. Three key factors ensure the success of the science application strategy for south Florida:

(1) methods for converting research and modeling results into planning objectives and evaluation protocols are scientifically reviewed;

(2) major resource issues facing the restoration community, and probable routes for resolving them, are identified through consensus by scientists and planners;

(3) the importance of addressing objectives and needs of both scientists and managers in regional restoration programs is recognized and balanced.

The accompanying "box and arrow" diagram illustrates the strategy that has been developed as a "model" for how science is being applied to planning and evaluation phases of programs designed to enhance sustainable restoration of natural and human systems in south Florida. The diagram shows the essential links between scientific research and the application strategy. A central component of the strategy is a set of conceptual landscape models, developed by south Florida scientists, which are used to convert broadly stated restoration goals and



Research…helps us understand how natural systems work. Science application…supports decision making, planning, and program management.

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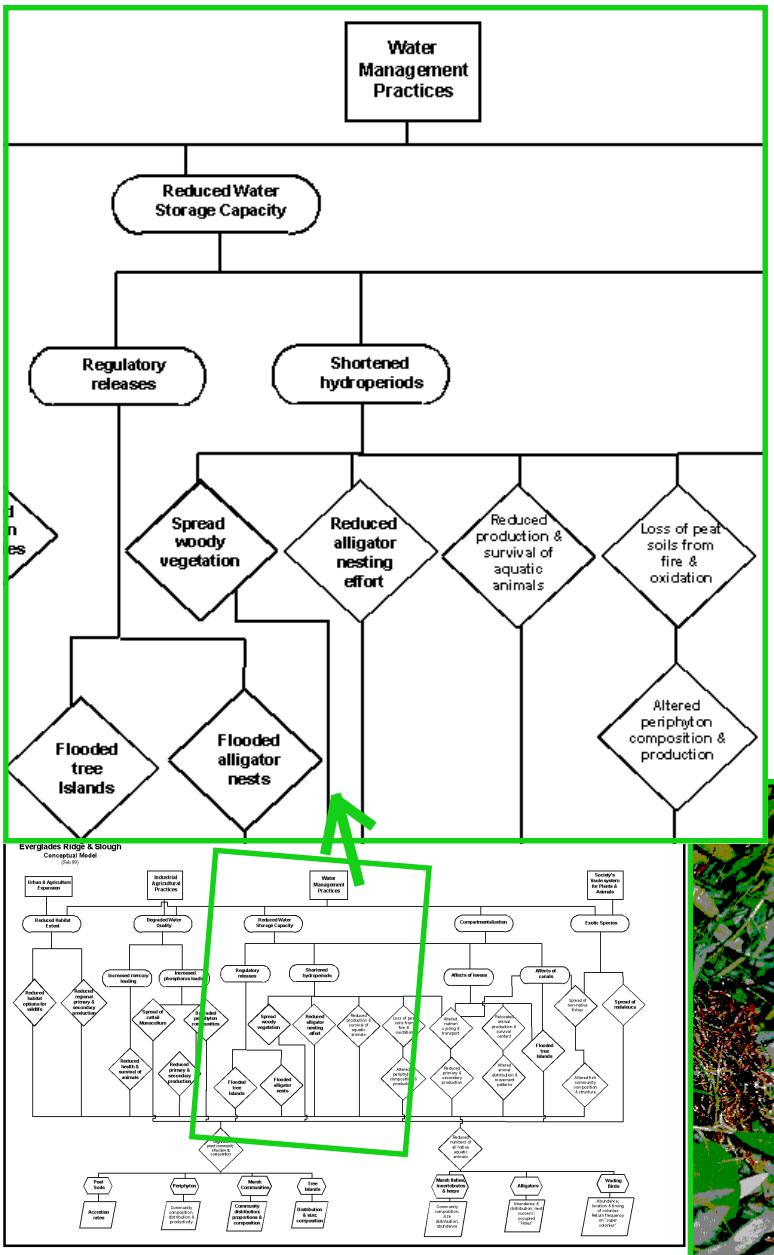
objectives into the specific, measurable indicators for each project. Nine different conceptual models have been created for regions stretching between the Kissimmee River basin and Lake Okeechobee across the Everglades and Big Cypress to Florida and Biscayne Bays. Additional models are planned. As illustated in the example below, each conceptual model identifies major human-related stressors on the ecosystem and key ecological and human effects from these stressors. These stressors and effects are the physical and biological indicators that are used to design performance measures and targets for specific restoration projects. The diagram shows that what is learned by measuring actual system responses during the implementation of the restoration programs is fed back (adaptive assessment) into the science application process in a number of ways. The feed-back loops may trigger

- alterations in specific design of a restoration plan;
- refinement of the conceptual models, and
- revisions in the priorities and content of future research, and may even shifts in priorities and values of society.

Among the key results of the science strategy is a set of commonly accepted physical and biological indicators for natural and human systems in south Florida. On the basis of these indicators, scientists and managers have created performance measures and targets for each restoration program. These performance indicators are also being used to develop a regionally comprehensive montioring program and an adaptive assessment protocol for measuring and evaluating, respectively, the actual system responses during and following implementation of the preferred restoration plan.



The above diagram is an example of the conceptual **Everglades Ridge & Slough** landscape model, showing the relationships between human activities, stresses on the ecosystem, and ecosystem response. The inset focuses on the influences of "Water Management Practices" on ecosystem response where, for example, the Reduced Water Storage Capacity of the existing landscape negatively affects alligator nesting effort.