



US Army Corps
of Engineers.

The SERDP Ecosystem Management Project CS-1114/7

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John Brent

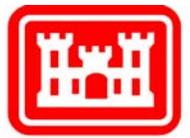
Fort Benning, GA

Ecological Society of America

August 1999



Department of Defense Long-Term Research Site(s)

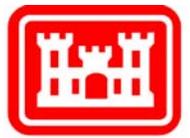


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- Program Name:** SERDP Ecosystem Management Program
- Sponsor:** DOD Strategic Environmental Research and Development Program (SERDP)
- Program Manager:** William D. Goran, USACE Engineer Research and Development Center, Champaign, IL
- Current Site:** Ft. Benning, Georgia/Alabama
- Longevity of Site:** Starting in FY99 (15 year plan)
- Nature of Work:** Focus on Mission Use/Ecosystem Dynamics



Department of Defense Long-Term Research Site(s)



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Groups Performing:

Army Corps of Engineers
University of Florida
Oak Ridge National Lab

Current Studies:

Health Indicators

Planned Studies:

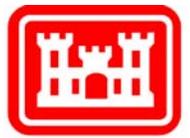
Disturbance Thresholds

Anticipated Expansions: Coastal/Estuarine Site, FY01/O2

Web Site:

www.denix.osd.mil/SEMP

The Problem



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Understanding of Ecosystem Management

- 👍 How does the ecosystem function?
- 👍 How do mission and protected resources interact?
- 👍 What are the thresholds of degradation?
- 👍 How might beyond-the-fenceline dynamics impact the mission?

Knowledge Gaps

Guidance for Ecosystem Management

- 👎 DoD Guidance
- 👎 Services Guidance
- 👎 SIKES Act/Regs
- 👎 Endangered Species Act/Regs
- 👎 Public Concerns

Adaptive Management

Ecosystem Management Practices

- | | |
|-----------------------|-------------------------------|
| 👍 Usage Management | 👍 Invasive Species Controls |
| 👍 Habitat Protection | 👍 Species Population Controls |
| 👍 Habitat Restoration | 👍 Erosion Control |
| 👍 Controlled Burning | 👍 Sediment Management |
| 👍 Planting/Harvesting | |

Technical Objectives



- To Address DoD Requirements and Opportunities in Ecosystem Management Research (as identified by the 1997 SERDP Ecosystem Science Workshop)
- To Establish a Long-term Research Site (or sites) on DoD Lands for DoD Relevant Ecosystems Research
- To Conduct Ecosystem Research and Monitoring Activities Relevant to DoD Requirements and Opportunities
- To Facilitate the Integration of Results and Findings of Research into DoD Ecosystem Management Practices

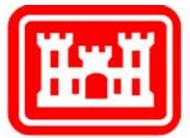
Change Indicators SON 99 Solicitation



- Identify and Test Potential Indicators of Change
- Define Historic Range of Variation in Indicators
- Develop Methods for Determining Change
- Identify Factors Leading to Change



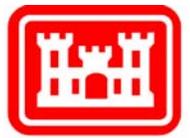
Disturbance Thresholds SON 00 Solicitation



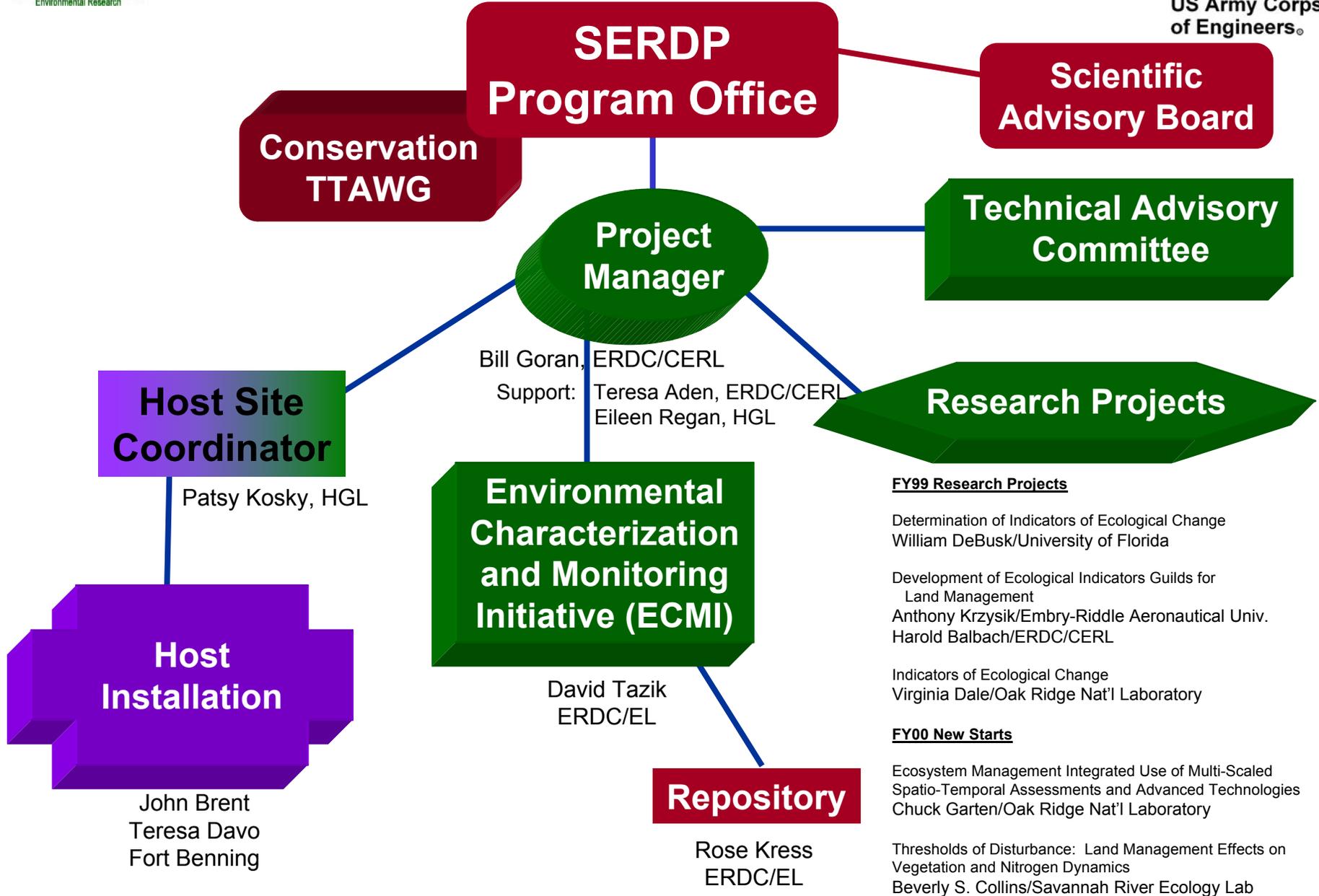
- ☹ Thresholds for Disturbance Beyond Historic Range
- ☹ Spatial Extent, Intensity and Frequency



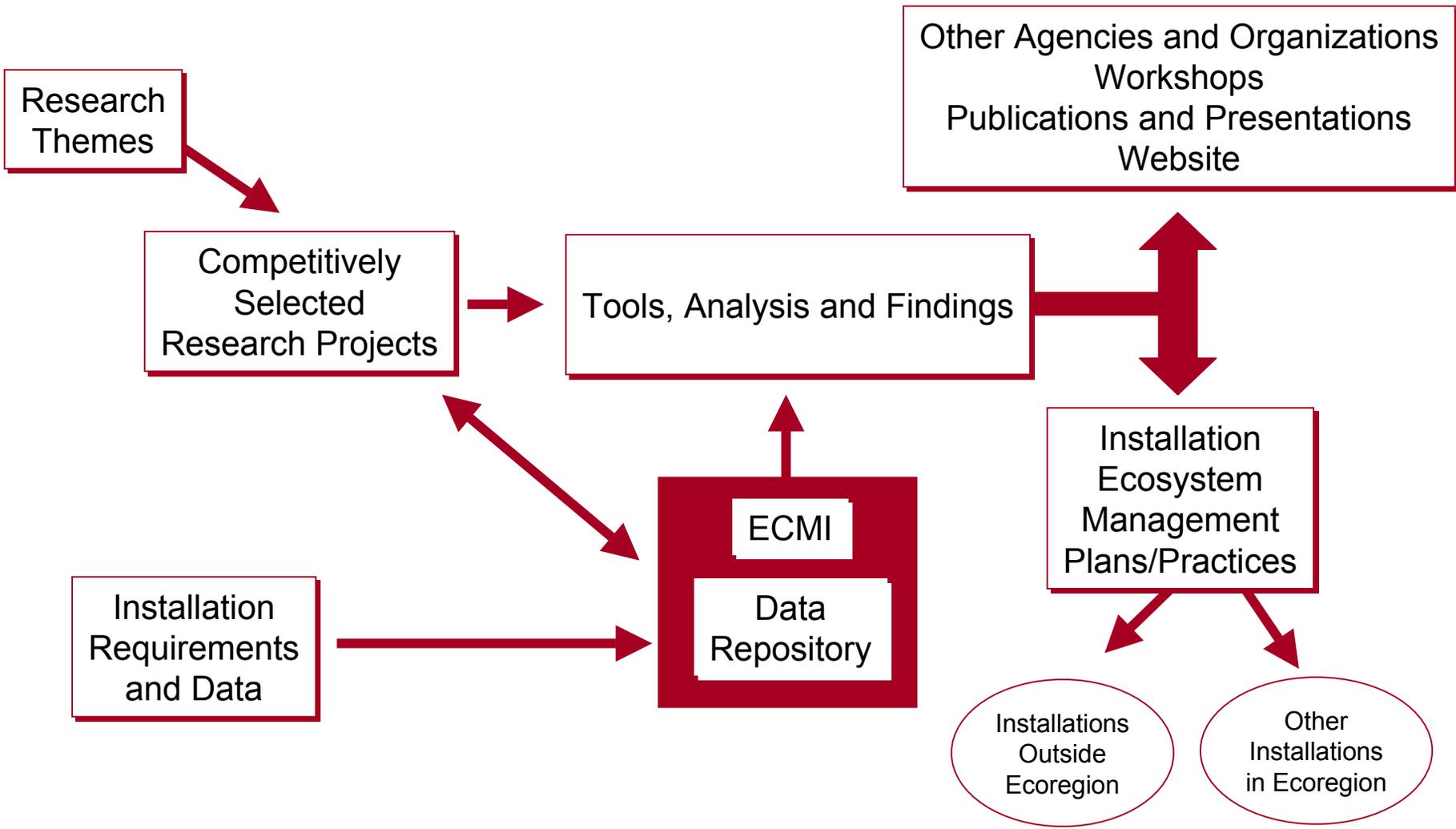
SEMP Organizational Approach



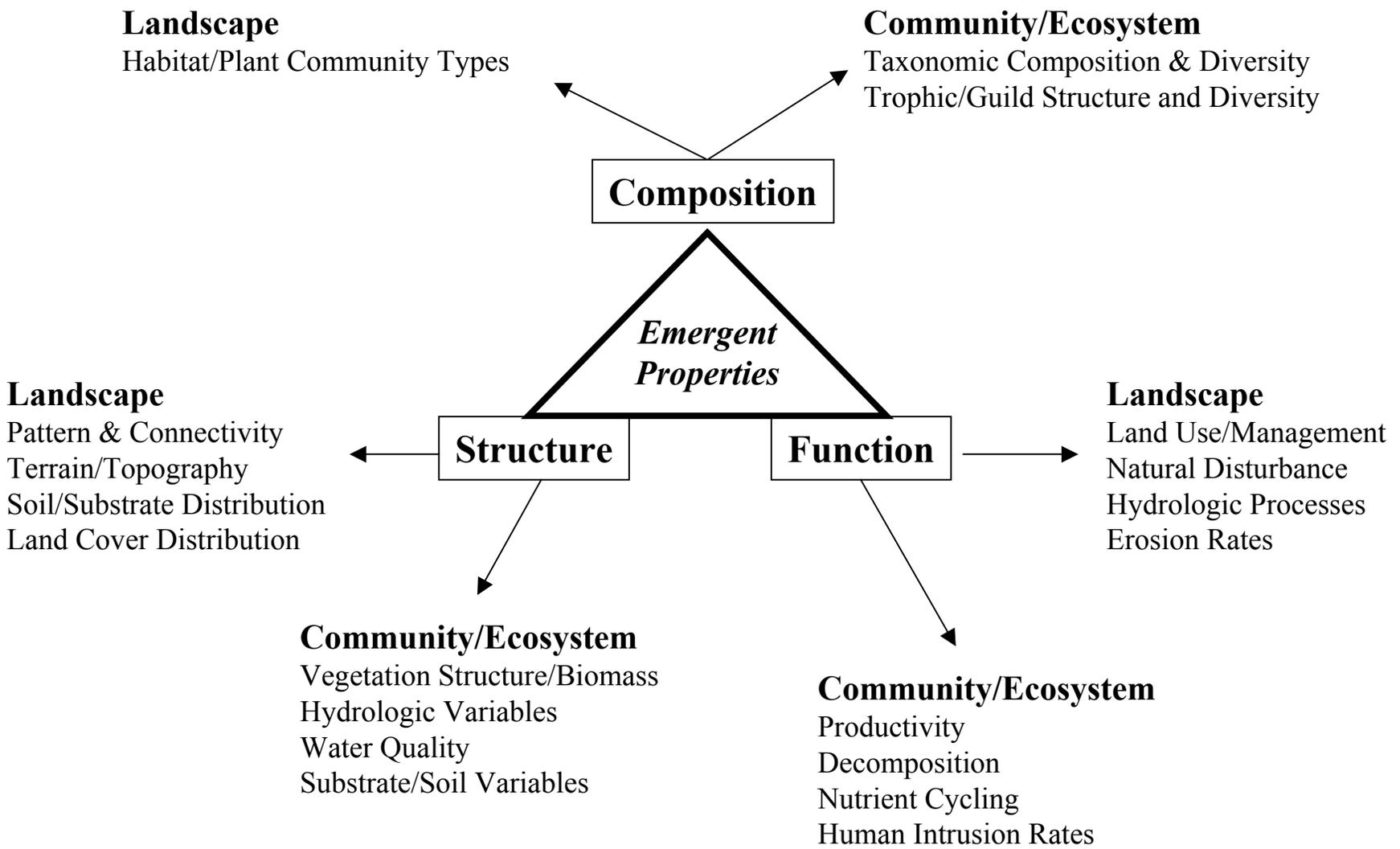
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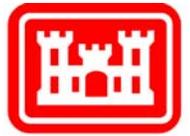
Technical Approach



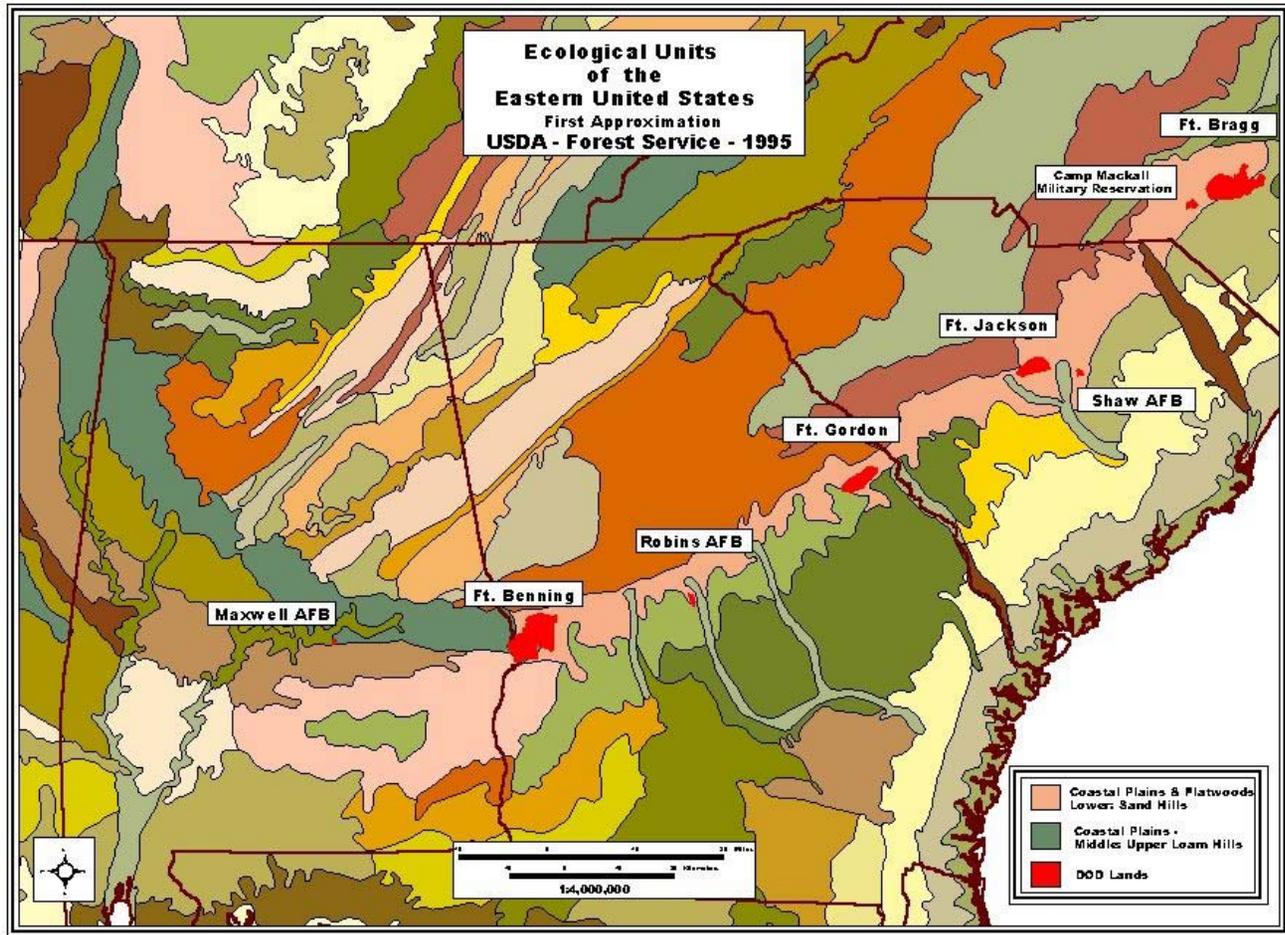
ECMI Monitoring Schema



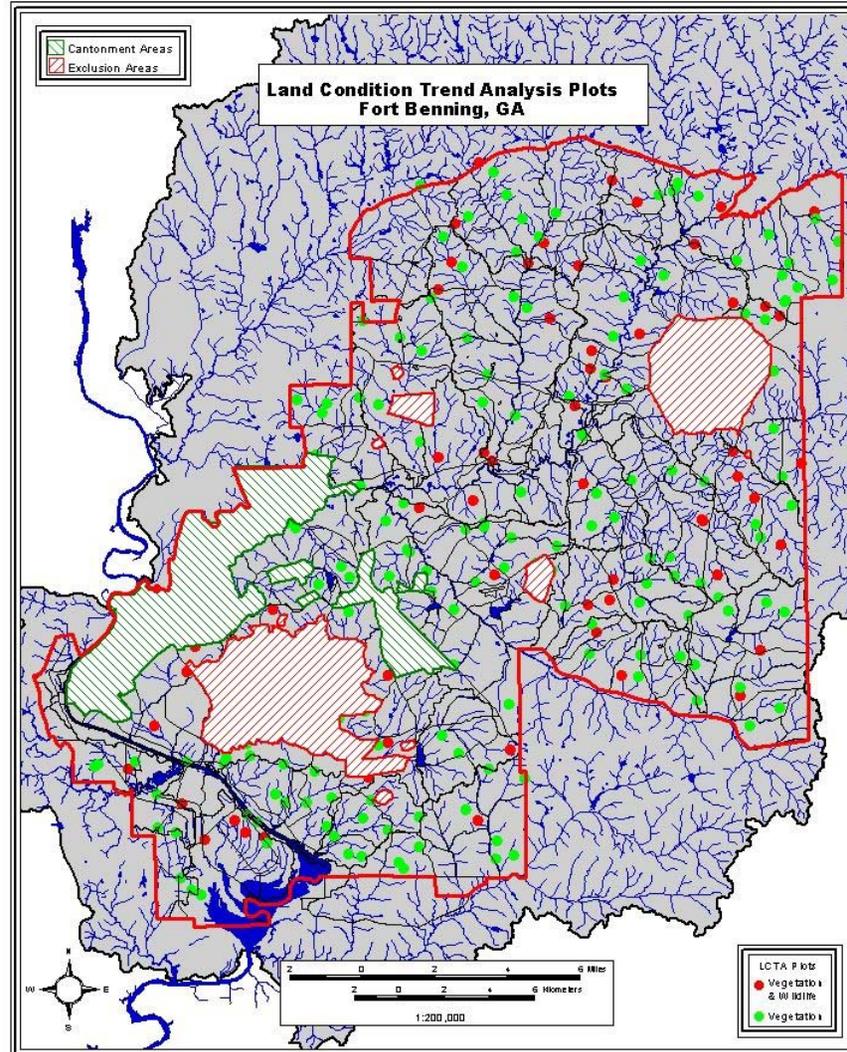
Regional Ecological Setting of Fort Benning and Selected Other DOD Installations



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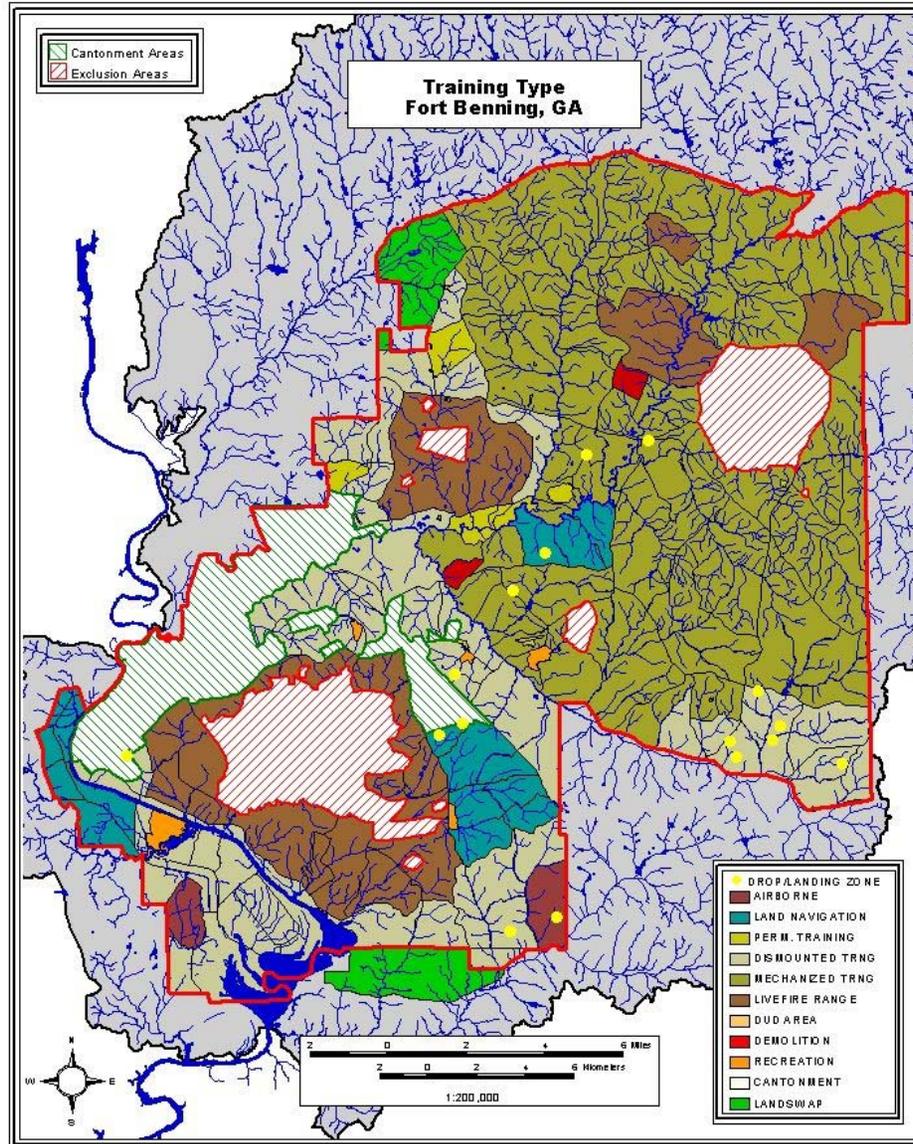
Distribution of LCTA Program Monitoring Plots



Dominant Training Type



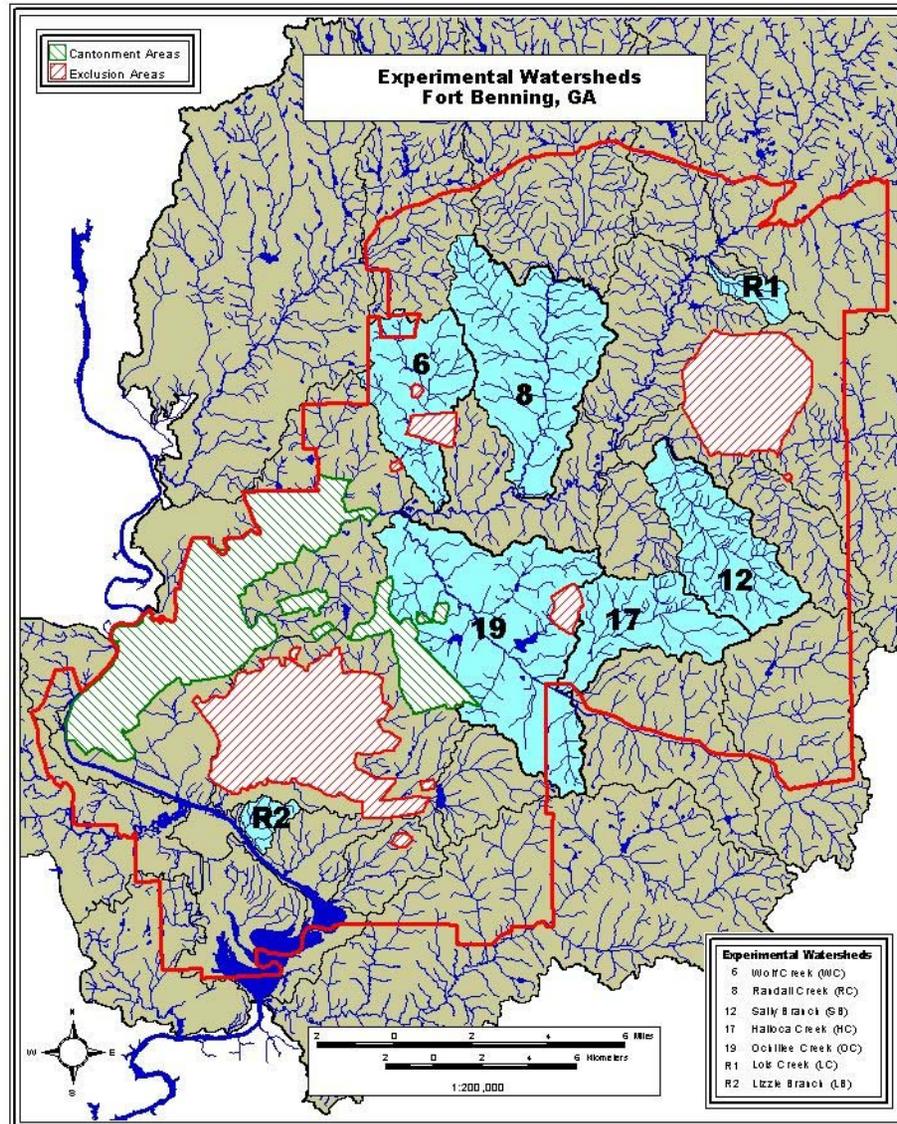
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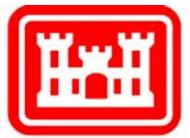
Experimental Watersheds



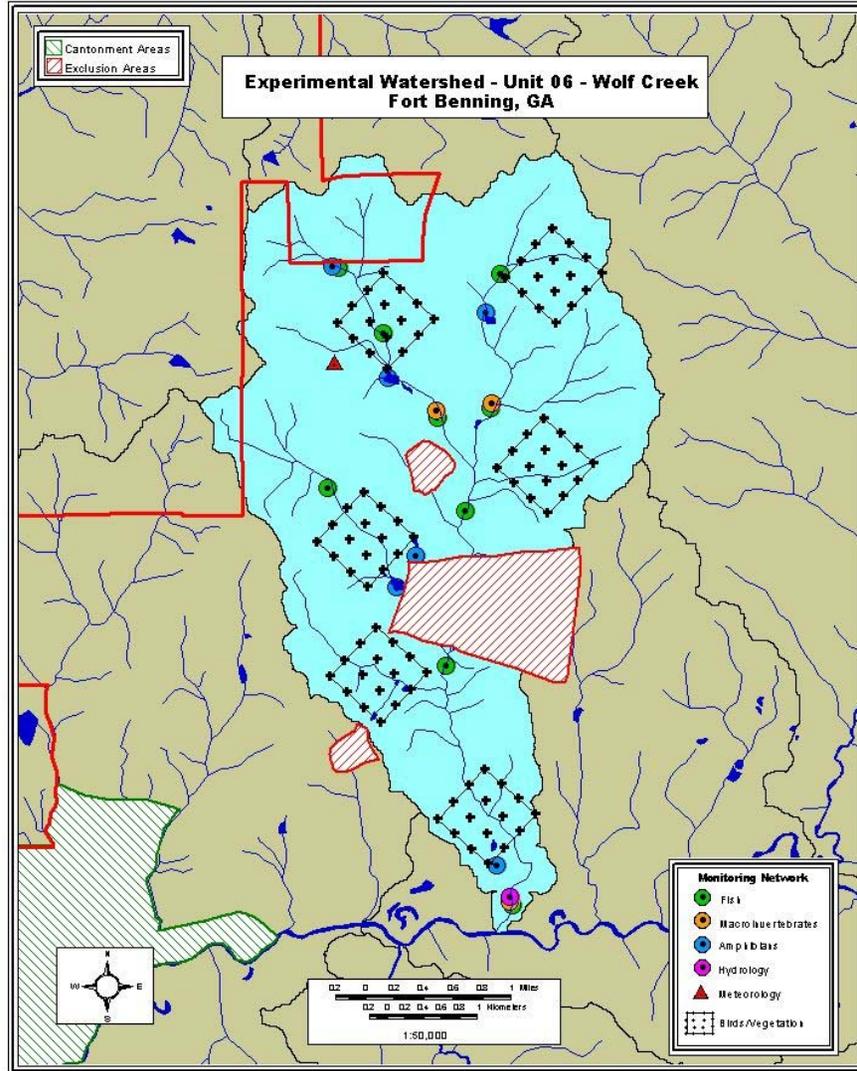
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Experimental Watershed in Wolf Creek

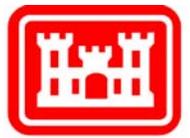


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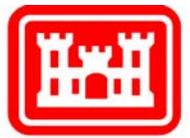


Backup Slides



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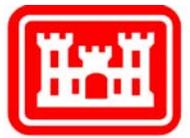
Determination of Indicators of Ecological Change



Team Lead Dr. William F. DeBusk
University of Florida, Gainesville

<u>Team Member Name</u>	<u>Task/Topic</u>	<u>Institution</u>
W. F. DeBusk	Soil/Sediment/Water Quality	Univ. of Florida
K. R. Reddy	Soil/Sediment/Water Quality	Univ. of Florida
A. V. Ogram	Molecular Microbial Ecology	Univ. of Florida
D. L. Miller	Vegetation ecology	Univ. of Florida
G. W. Tanner	Vegetation ecology	Univ. of Florida
J. Jacobs	Surface Water Hydrology	Univ. of Florida
P. S. Rao	Vadose Zone Hydrology	Purdue Univ.
W. Graham	Synthesis/Modeling; Hydrology	Univ. of Florida

Indicators of Ecological Change



Team Lead Dr. Virginia Dale
Oak Ridge National Laboratory

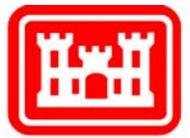
Team Member Name

Role

Institution

Virginia Dale	Landscape Ecology	ORNL
Thomas Foster	Historic Land Cover	Penn State Univ.
David White	Microbiology	Univ. of Tennessee
Pat Mulholland	Aquatic Ecology	ORNL
Katherine Eddins	Technology Transfer	The Nature Conservancy
John Hall	Technology Transfer	The Nature Conservancy
Teresa Davo	Impact Experiments and T2	Ft. Benning DOT

Development of Ecological Indicator Guilds for Land Management



Team Lead Dr. Anthony J. Krzysik, U.S. Army CERL

Team Member Name

Task/Topic

Institution

John M. Emlen

Theoretical Ecology

U.S. Geological Survey

D. Carl Freeman

Plant Ecology & Physiology

Wayne State University

John H. Graham

Population Genetics

Berry College

David A. Kovacic

Ecosystem Ecology

University of Illinois

Lawson M. Smith

Geomorphology/Geology

Geotechnical Lab, WES

Ann-Marie Trame

Plant Populations

USACERL

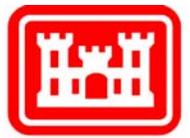
John C. Zak

Soil & Microbial Ecology

Texas Tech University



Technical Advisory Committee for SEMP



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Dr. Penny Firth, National Science Foundation
Dr. Sam Pearsall, Science Advisor, North Carolina Nature Conservancy
Mr. Peter Boice, Director of Conservation Programs, Deputy Undersecretary for Defense, Environmental Security
Dr. J. Whitfield Gibbons, Savannah River Ecology Lab and University of Georgia
Dr. James Spotila, Chief Environmental Scientist, Assistant Sec. of the Army (IL&E)
Dr. Doug Ripley, Headquarters, Air Force
Dr. Roger Dahlman, Program Manager, U.S. Department of Energy
Mr. Richard McWhite, Eglin Air Force Base

Ex-Officio

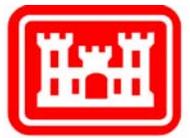
Mr. John Brent, Chief, Fort Benning Environmental Office
Mr. William Goran, Technical Director, U.S. Army Engineering Research and Development Center, Champaign, IL
Dr. Robert Holst, Program Manager, Conservation, Compliance and Pollution Prevention, SERDP Program Office
Dr. David Tazik, U.S. Army Engineering Research and Development Center, Vicksburg, MS
Ms. Teresa Davo, Fort Benning Directorate of Training

1997 Ecosystem Research Workshop Identified Research Themes for “Knowledge Gaps”



- Indicators of Ecosystem Status
 - Ecosystem health
 - Signals of change
- Ecological Thresholds
 - Disturbance beyond unaided recovery
 - Minimum population/habitat size
 - Minimum species, ecosystem and landscape diversity
 - Critical zones along biogeochemical gradients

1997 Ecosystem Research Workshop Identified Research Themes for “Knowledge Gaps”



- Role of Manipulating Biogeochemical Cycles
 - To favor one species over another
 - To promote biodiversity
 - To promote recovery
- Important of Spatial/Temporal Scales
 - In the disturbance/recovery cycle
 - In off-post/on-post relationships
 - Relationship between shape, pattern, size and ecosystem dynamics

ECMI Role

- Establish Infrastructure for Long-term Research Platform
- Design, Implement, and Adapt Baseline Ecological Monitoring
- Maintain Data Repository

LCTA Objectives

(per DA PAM 350-4--ITAM)

- Monitor Natural and Cultural Resources, and Analyze Data for Trends and Impacts to Natural and Cultural Resources, to Include Identification of Possible Sources of Changes and Trends
- Identify and Recommend Land Rehabilitation and Maintenance Priorities
- Provide GIS Capability to Installation ITAM Programs
- Provide Information that may Affect Force Structure and Stationing Decisions at MACOM and DA Levels