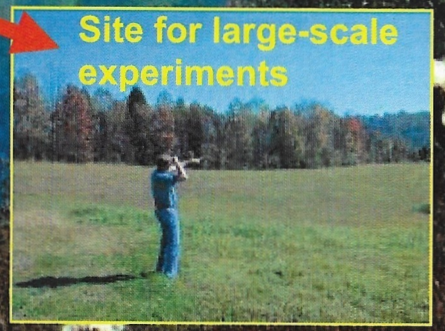
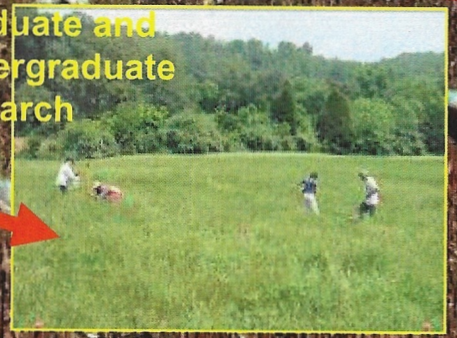
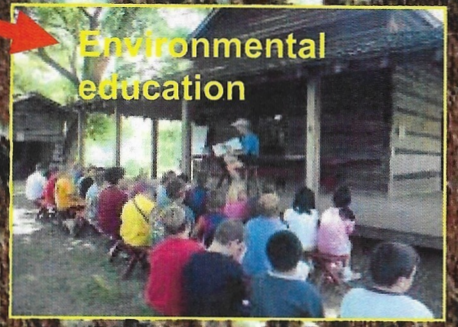
Three Bends Environmental Research and Education Center







Research Priorities for the Next 10 Years:

- DOE
  - Establish next-generation, larger-scale experiment to measure ecosystem response to multiple, interacting factors (CO_2, temperature, soil moisture)
  - Initiate new research to address fundamental questions about the adaptability of species to climatic change and its potential effect on the geographic boundaries of ecosystems and the organisms they contain
  - Use experimental data to inform dynamic biogeography models that predict changes in the location of future ecosystems and feedback effect of such changes on the climate system
- EPA
  - Develop new experimental program to study when and how environmental change produces nonlinear ecological responses in linked aquatic and terrestrial systems.
- NSF, NASA
  - Develop new approaches to networked monitoring of ecosystem function with real-time data assimilation and interpretation

Needs for a UTK Field Station -

An environmentally friendly building using state-of-the art energy-efficiency technologies and containing classroom, conference room, offices, laboratories, and environmental monitoring stations to facilitate field research on the Oak Ridge Reservation by local scientists, students, and visiting researchers from around the world

- **Benefits**
  - Increase opportunities for long-term field research
  - Opportunities for large-scale manipulative experiments
  - Better incorporate undergraduates in research
  - Enhance quality of graduate and undergraduate education

Sponsor Opportunities

- DOE/Science
  - $15M/yr now
  - Must prepare for new projects on climate and field research
- NSF - National Ecological Observatory Network (NEON)
  - $20M infrastructure and operations

- EPA
  - Biological indicators
- NASA, NOAA
  - Nature-Human interactions studies

- USDA - Weedy and Invasive Plants
- NSF - IGERT (Integrative Graduate Education and Research Traineeship Program); REU (Research Experience for Undergraduates)

National Ecological Observatory Network

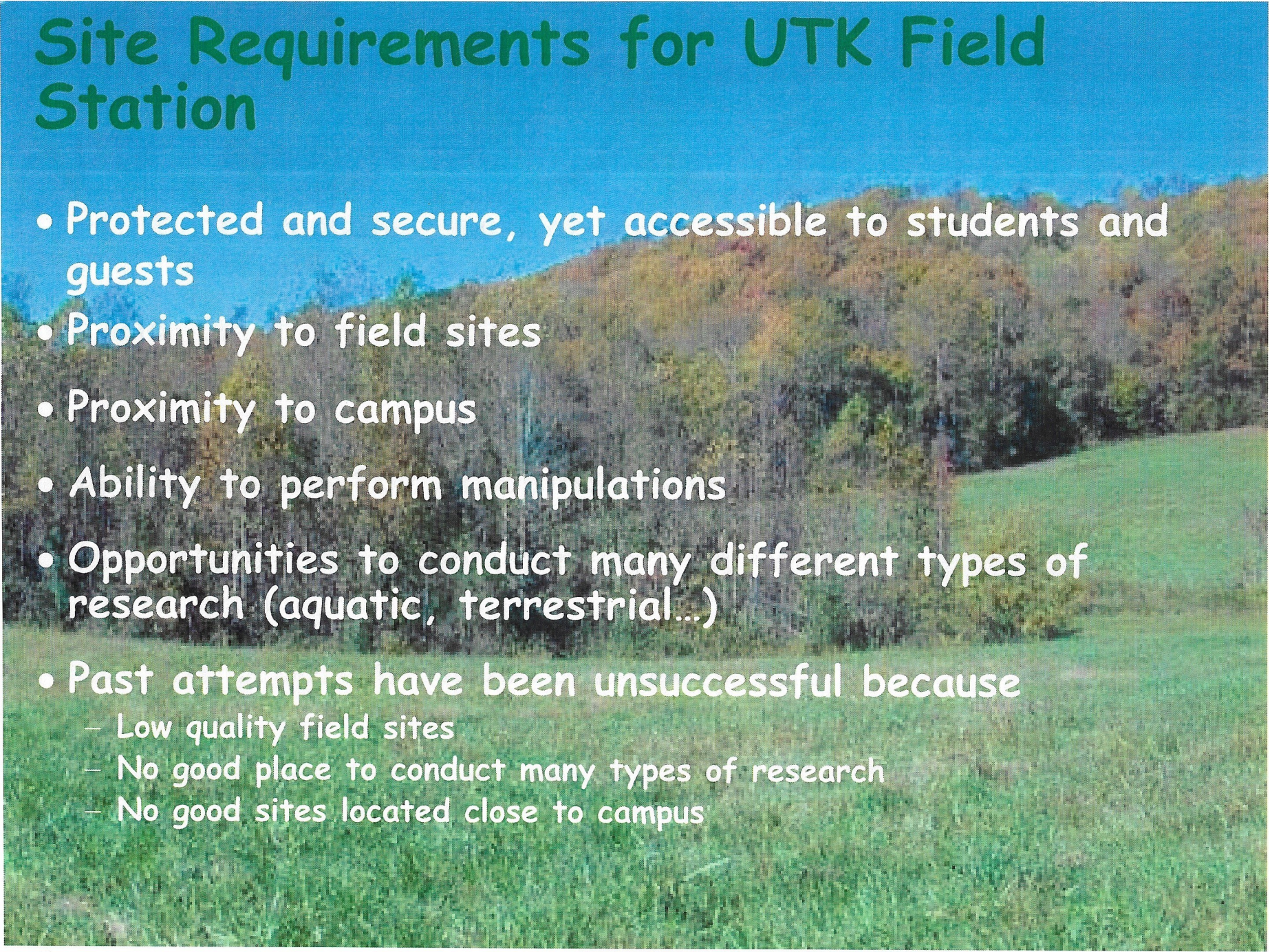
- ORNL, in partnership with UTK and GSMNP, should compete for the NEON district in climate domain 7
  - NSF likely to issue "Call for Prospecti" in 2006
  - Prospecti are for one district of 3 sites in wildland, managed, and urban land with deployment of intensive instrumentation within each domain
  - Only one prospectus likely to be chosen in each regional domain
- Requirements for a successful prospectus
  - Multi-institutional involvement with significant educational opportunities
  - Field stations (space for lab instruments, computers, living accommodations, etc)
  - Land set asides for future experiments (plots, small catchments)
  - Access for researchers and security of instrumentation for 30+ years
- ORNL strengths as NEON participant
  - Walker Branch, possibly Solway Bend area as wildland site (building off past and current work)
  - Field station at Solway Bend (there are no others in the domain)
  - Educational activities at Freels Bend
  - Land set asides for experiments at Solway Bend and Freels Bend
  - Guarantee of access and security for long time period

neon

Site Requirements for Research

- Protected and secure, yet accessible land
- Sufficient space to set up long-term manipulative experiments
- Proximity to infrastructure: roads, electricity, water, and internet connectivity to support large scale manipulations
- Buildings to house laboratory equipment, support sample processing, and provide for safety of researchers
- Ecological characteristics:
  - replicated habitat types
  - distinct aquatic, old-field, and forest interfaces
  - successional gradient
  - microclimatic gradient

Site Requirements for UTK Field Station



- Protected and secure, yet accessible to students and guests
- Proximity to field sites
- Proximity to campus
- Ability to perform manipulations
- Opportunities to conduct many different types of research (aquatic, terrestrial…)
- Past attempts have been unsuccessful because
  - Low quality field sites
  - No good place to conduct many types of research
  - No good sites located close to campus