

Internet-enabled Earth Explorer Simulation

An Internet-enabled geospatial simulation for Earth System Science learning

Stephen D. Prince (sprince@umd.edu) Haihong Yang (yanghh@umd.edu) Geography Department, University of Maryland

I. Aims of Earth Explorer simulation for education

- ❑ Aims to meet the pedagogical needs of Earth System Science education
- ❑ Student-initiated and scenario-driven Earth exploration to simulate real Earth processes with actual observations
- ❑ Simulations able to use large data sets including satellite imagery
- ❑ Active learning environment in which student inputs drive simulation models
- ❑ Simple and modular structure allows instructor to implement any type of simulation
- ❑ Accessible by students individually or in multi-site interactive groups

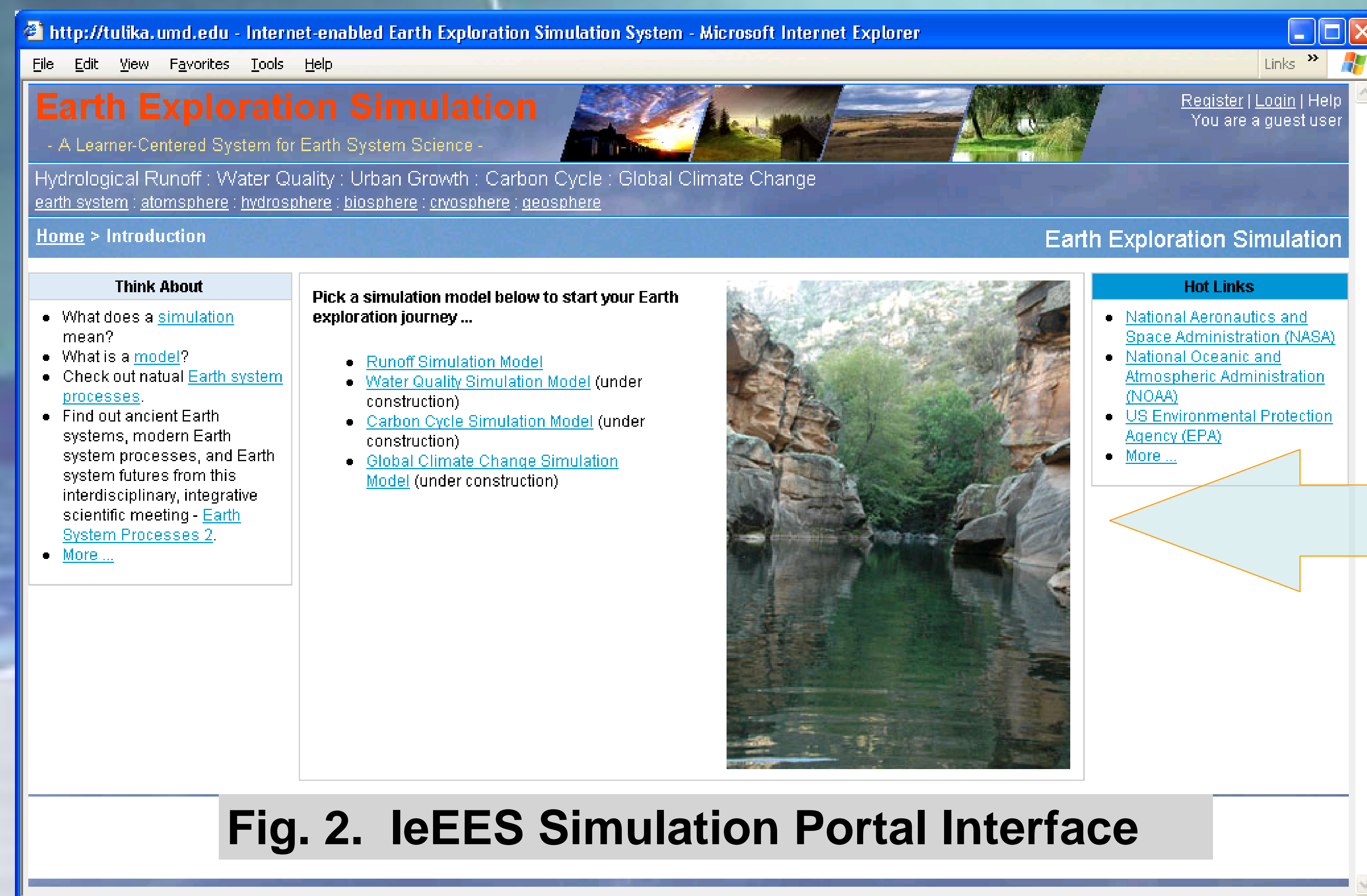


Fig. 2. IeEES Simulation Portal Interface

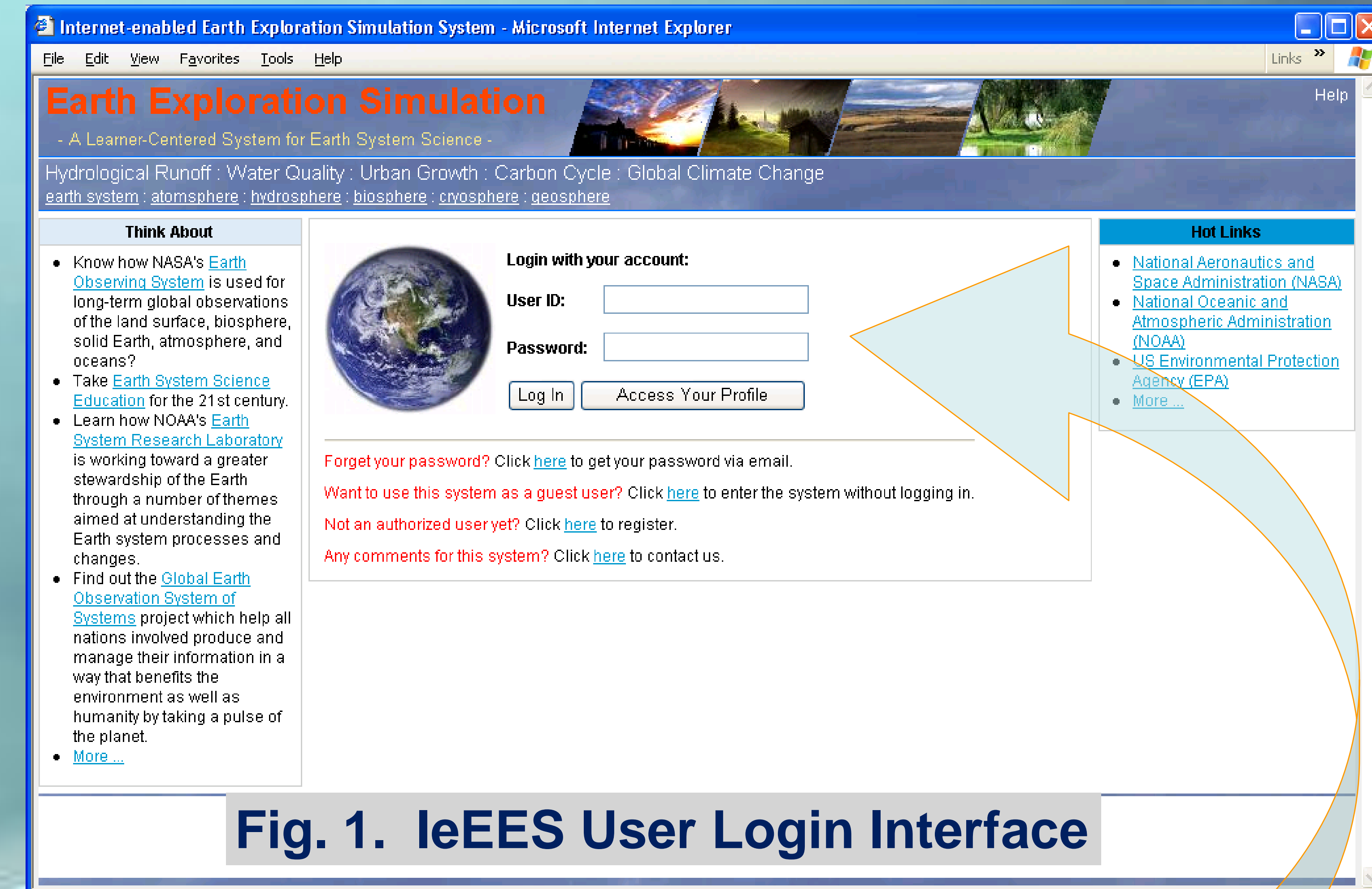


Fig. 1. IeEES User Login Interface

II. Internet-enabled Earth Explorer Simulation prototype

- ❑ Login as individual learner and/or join a study group – remembers details of last session
- ❑ Introduction offers Earth System Science-relevant links, hot topics, and describes Earth Explorer Simulation provided
- ❑ Explore existing simulation scenarios or initiate new scenarios
- ❑ Adjust simulation variables or make changes to the study area
- ❑ View the simulation results to see impact of changes made and assess the outcomes
- ❑ Interact with simulation making changes to parameters and input variables
- ❑ Understand the simulated processes through further interactive changes and assessment of effects

III. Principles of system architecture

- ❑ No specialist software needed by end user, only Internet browser and broad-band connection
- ❑ Flexible and modular system architecture - allows the instructor to customize both interface and learning contents
- ❑ Open framework to make addition of new Earth Explorer Simulation model simple
- ❑ Realistic Earth System Science simulation models
- ❑ Makes use of NASA science, technology and data, access to extensive geospatial data
- ❑ Student-engaged learning experience
- ❑ Data collected by students can be used
- ❑ Students can investigate their own neighborhoods
- ❑ Learning material and tools are science and policy relevant
- ❑ Learning contents are presented in attractive formats with intuitive interfaces

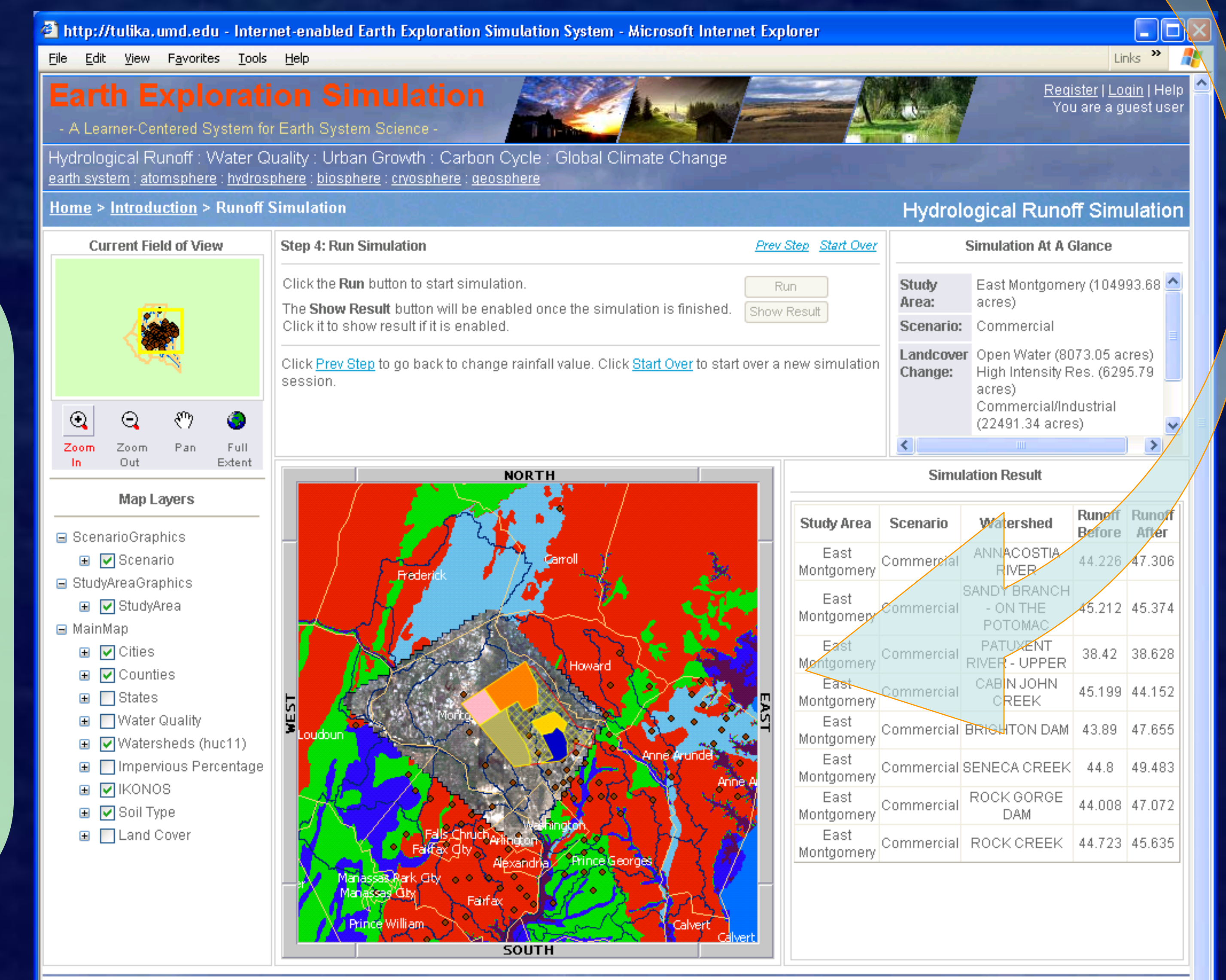


Fig.3. IeEES Storm Runoff Simulation Interface

