NEHEA and GeoBrain – An Organization and System for Data-Intensive Earth System Science Education and Research at Colleges Around the World

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Key words:

SUMMARY

Earth system science (ESS) research often requires integrating, analyzing, and modeling with large amount of multi-disciplinary, multi-source geospatial data. Satellite remote sensing is one of the major sources of such data. Currently, NASA EOSDIS has archived more than three petabytes of Earth remote sensing data. Those data are essential for conducting ESS research. Therefore, training students on how to effectively use large amount of remote sensing data is the essential part of their ESS education. However, currently most of undergraduate students have never been trained to handle the huge volume of available data because of lack of resources and suitable teaching technology at ESS colleges. In order to reduce this problem, we are developing a web-based geospatial information system, called GeoBrain, for providing a data-enhanced on-line learning and research environment for ESS education and research. The system makes petabytes of NASA EOS data and information easily accessible to any higher-education users around the globe. The system allows users to dynamically and collaboratively develop interoperable, web-executable geospatial process and analysis modules and models, and run them on-line against any part of the peta-byte archives for getting back the customized information products rather than raw data. The system makes a data-enhanced ESS learning and research environment, backed by petabytes of NASA EOS data and large computing powers that are unavailable to students and professors before, available to them at their desktops free of charge. In order to integrate this new learning environment into ESS teaching and research, a NASA EOS Higher Education Alliance (*NEHEA*), consisting of the GeoBrain development team led by GMU and a group of Earth science educators selected from an open RFP process, has been formed. NEHEA also welcomes Earth science educators around the world to join. NEHEA members are incorporating the data enhanced learning environment into their teaching and on-going research and will develop new courses for taking advantages of the environment.

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