

The future of climate and geo-science

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High Performance Computing is currently deployed in several centers for climate and geo-science research, but not at the levels needed to achieve substantial success on a global basis, given the complexity of the problem. A quantum leap in capabilities will be necessary to handle next-generation climate models that integrate newly emerging sciences, high-resolution grids, and voluminous observational data from satellites and sophisticated ground devices. Dr. Bishop will discuss efforts to build an International Centre for Earth Simulation (ICES) based in Switzerland that takes an holistic systems approach, and that has the competence and resources to achieve new insights in this new decade, and is capable to globally influence public policy with respect to weather, climate, environment, bio-geo aspects, disaster risk reduction and socio-economic development. On this progressively crowded and fragile planet, such a capability will be invaluable, Bishop believes, if not imperative, for our long-term survival. ICES could serve as a test-bed for large scale public and private development planning. Decision makers could ask 'what if' questions for major construction projects (such as China's Three Gorges Dam), and then interactively evaluate alternative scenarios. Likewise, ICES could help uncover the possible unintended consequences of climate remediation and adaptation strategies, geo-engineering ideas, CO2 sequestration, deep sea drilling, etc. ICES would be a resource for building more resilient societies in an era of rapid climate change and frequent natural disasters (such as flooding, extreme weather events, landslides and volcanic ash clouds), and therefore of great consequence to our future well-being. It would ultimately play a major role, in conjunction with the current national and regional centers, in the education and training of policy-makers, the public, and future Earth Scientists.