

## **DIGITAL GOVERNANCE AND HOTSPOT GEOINFORMATICS FOR MONITORING, ETIOLOGY, EARLY WARNING, AND MANAGEMENT**

This project will focus on developing a prototype geoinformatic hotspot surveillance system that relies on advanced statistical techniques for detecting hotspots of critical importance to governments around the world in such areas as public health, watershed management, persistent poverty, and networked infrastructure security.

### ***Co-chairs:***

**G.P. Patil, Department of Statistics, Penn State University**, and collaborators in India, Indonesia, United States, and Nigeria, Poland, and Taiwan.

### **Project Summary**

For the declared scope of the proposal competition, this proposal may look ambitious, but the proposed working group would like to call it opportune. Given the opportunity, we believe that the visionary sponsors would feel happy and proud of their vision and our response. We are at present an international Center – Satellite – Assemblage. With the proposed funded support, we plan to become an international Row-Column-Lattice-Composite-Group, with every purposeful pair, triple, and more, synergistically advancing to launch an International Digital Governance and Hotspot Geo Informatics Forum at the end of the three year period.

The domain of interest of the proposed working group lies in the exciting theme of a successful five year NSF Digital Government Project in its midcourse for Geo Informatics Surveillance. A declared purpose of digital governance is to empower public with information access to enable transparency, accuracy, and efficiency for societal good at large. Spotting what is hot and prioritizing becomes naturally, hotspot Geo Informatics has become a critical need for the 21st century.

Our working group efforts will be motivated by vital case studies of societal importance around the world, pertaining to public health, eco health, eco system conditions, watershed management, persistent poverty alleviation, and networked infrastructure security. The international partnership will function with internet communications focused on the coupling of live case studies and prototype methods and tools. The projected five face-to-face meetings will strengthen and sustain the interactive and collaborative components. The meetings will be organized to maximize productivity and output for each case study, for each method, and for each tool. Each meeting will be in nature of a cross-fertilizing five day workshop and short

course, equipped with everyone's laptop and projection. Everyone will in turn be a professor, a student, a scientist, decision maker. The working group will initiate a publications program.

The proposed working group will function and sustain itself in 10 headings with 10 co-chairs. The overall working group will have 22 members across six countries inclusive of USA, Italy, India, Indonesia, China, and Japan. The number of US participants will be 8, inclusive of 2 doctoral students. The number of overseas participants will be 14, inclusive of 4 doctoral students and 4 young researchers. Thus, the working group will consist of 11 seasoned researchers, 5 young researchers, and 6 enthusiastic doctoral students.

### **December 2008 Meeting, JalaSRI, Jalgaon, MS, India**



The third meeting of the working group was held at JalaSRI, Jalgaon, India at the Unique District Level Watershed Surveillance and Research Institute during December 17-29, 2008. The twelve-day program again brought together working group members and invited participants with a wide range of expertise and experience to participate in presentations, tutorials, deliberations, and brainstorming events. In addition, field trips were taken to several dam sites (Hatnur Dam Pump Station and Waghur Dam), a pipe factory, and the Ozarkheda Reservoir.

As a result of some of the working group activities, emerging and existing project ideas have come to life and partnerships have emerged. For example, the District Level Watershed Surveillance and Research Case Study Team has evolved into a research, training, and outreach institute with 15 full-time researchers and two model watersheds serving as field laboratories, covering over one thousand and fifty thousand hectares areas. They have also created a stimulating anthem and two exciting dance dramas (90-minutes in duration for urban and rural audiences) that bring together local wisdom and present day science to demonstrate digital governance, hotspot

geoinformatics, river and stream networks, sensor networks, youth brigades, and watershed development.

The Italian Map of Nature Case Study Team has joined hands with the Indian District Level Watershed Surveillance and Research Case Study Team to recently win a Milan City Millennium Development Goals Grant for the purposes of examining the appropriate development and application of hotspot methodology and software in the watershed field.

Activities of the co-chair have created an opportunity for a consortium, which is now in planning stages, between Penn State; TERI University, Delhi; JalaSRI, Jalgaon; and the International Crop Research Institute for Semi-Arid Tropics, Hyderabad for Geoinformatics, Environmetrics, Ecometrics, and Aquatics for Water, Energy, and Natural Resources Development. TERI is connected to the Intergovernmental Panel on Climate Change (IPCC).

The group at present includes members from the United States, Germany, Italy, India, Indonesia, China, and Japan. The next group meeting is scheduled for June 1-7, 2009 in Delhi and Jalgaon.

### **December 2007 Meeting, JalaSRI, Jalgaon, MS, India**



The second meeting of this working group, held in JalaSRI, Jalgaon, MS, India, included insightful and colorful presentations and deliberations followed by brainstorming, round table dialogues and planning for international initiatives.

The second meeting of the working group was held at JalaSRI's Conference Room, December 15-23, 2007. Co-chair Ganapati Patil, Penn State Center for Statistical Ecology and Environmental Statistics, organized the meeting of some thirty-five members and invited participants, representing a wide variety of disciplines and institutions. The group as also represented a range of expertise and experience, with a focused common interest in digital governance and hot spot geoinformatics for monitoring, etiology, early warning, and management. The five-day program included insightful and colorful presentations and deliberations followed by brainstorming, round table dialogues and planning for international initiatives.

The participants were hosted by the enthusiastic North Maharashtra University Vice Chancellor K.B. Patil and the University Research Faculty on

their beautiful campus in Jalagon. Bhavarlal Jain, the visionary founder of the innovative, multinational initiatives for drip-irrigation on the paush green micro-watershed, also participated. Another local participant included District Collector Vijay Singhal, who presented a case study on his district level river linking area. Distinguished visitors included former cabinet ministers of the State of Maharashtra interested in the district level issues of watershed management and nature conservation.

The international working group continued planning of a Hotspot GeoInformatics and Digital Governance Case Book. The tentative plan is to emphasize the following key parts in the Case Book : (1) Digital Governance and Hotspot GeoInformatics Methods, and Software Tools with Case Studies in USA; (2) Map of Italian Nature, and (3) Indian District Level Water Harvesting and Management.

“With the momentum provided by their effort, long term prospects for continuing this collaboration is good” said Dr. Patil. “The chances are that we will have prepared ourselves into launching an international forum for digital governance and hotspot geoinformatics. And since the programs of several working group members are in the process of being institutionalized in one form or the other, it will help strengthen and sustain continuity. Furthermore, sophisticated scientific issues and their implications for the models, methods, and tools will continue to keep the hotspot geoinformatics areas in the forefront. And this would help strengthen and sustain continued scientific challenges, methodological opportunity, software sophistication, and novel information technology for digital governance.”

The next meeting of the group is slated for December 2008 again at JalaSRI, Watershed Surveillance and Research Institute, M.J. College, North Maharashtra University, Jalgaon, Maharashtra State, India. It is a novel and unique digital governance initiative in at the district level for watershed surveillance and geoinformatics involved with river connectivity for water availability, bioreserve connectivity for endangered species, microwatershed development, bird flu and dengue fever, and socioeconomics of poverty and unemployment.

## May 2007 Meeting, Penn State, University Park, PA



The first meeting of this working group was held at Penn State's Information Sciences and Technology Building in May of 2007.

Co-chair Ganapati Patil, Penn State Center for Statistical Ecology and Environmental Statistics, organized the meeting of some twenty five members and invited participants, representing a wide variety of disciplines and institutions as well as a range of expertise and experience, all with a focused common interest in digital governance and hot spot geoinformatics for monitoring, etiology, early warning, and management. The five-day meeting included presentations and deliberations, followed by brainstorming round table luncheon dialogues and international initiatives planning evenings.

The group has begun its planning of a case studies book for publication, Hotspot GeoInformatics and Digital Governance Case Book. It is expected to be a frontline monograph on this theme covering timely issues and areas of societal and scientific importance. A declared purpose of digital governance it is to empower public with information access to enable transparency, accuracy, and efficiency for societal good at large. Spotting what is hot and prioritizing it become natural undertakings as a result of the space-time information access. Naturally, hotspot geoinformatics has become a critical need for the 21st century.