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Statistical Geoinformatics of Geographic Hotspot Detection and Multicriteria Prioritization for Monitoring, Etiology, Early Warning, and Sustainable Management for Digital Governance in Agriculture, Environment, Ecology and Ecohealth

Ganapati P. Patil
Center for Statistical Ecology and Environmental Statistics, Department of Statistics, Penn State University, University Park, PA 16802, USA

SUMMARY

This paper is based on the Inaugural Session Keynote Address to the Conference, given in the spirit of inviting the attention of the audience to some of the initiatives of the author that have presently culminated into a novel and innovative project for digital governance and hotspot geoinformatics under the sponsorship of the US National Science Foundation.

GeoInformatics of geospatial and spatio-temporal hotspot detection and prioritization is a critical need for the 21st Century. A declared need is around for statistical geoinformatics and software infrastructure development. A hotspot can mean an unusual phenomenon, anomaly, aberration, outbreak, elevated cluster, critical area. The declared need may be for monitoring, etiology, early warning, or sustainable management. The responsible factors may be natural, accidental or intentional. The five year NSF Digital Government Research Program project has been instrumental to conceptualize hotspot geoinformatics partnership among several interested cross-disciplinary scientists in academia, agencies, and communities around the world. Our efforts are driven by a wide variety of case studies involving a wide variety of critical societal issues.

You are invited to participate in ongoing workshop series around the world in a manner most productive for your purposes and publications. You will have the opportunity to strengthen, advance, and accelerate your in-house research workplan involving novel geoinformatics and innovative hotspot dynamics with capability for early warning and sustainable management. It will be a pleasure to communicate, interact and publish. See the website :

http://www.stat.psu.edu/hospots/pdfs/OverallInfo_ShortCourseandWorkshops.pdf

Key words: Hotspot detection and prioritization, Surveillance system, Digital government, GIS, Information technology, Upper level set scan statistic, Hasse diagrams, Partially ordered sets, Hotspot rating, Carbon budgets, Water resources, Ecosystem health, Public health, Drinking water distribution system, Persistent poverty, Environmental justice, Crop pathogens, Invasive species, Biosurveillance, Remote mobile sensor network, Early warning system.

1. SETTING THE STAGE

It is a great pleasure for me to be here at this historic Diamond Jubilee Program Conference, also in honor of Dr. V.G. Panse and Dr. P.V. Sukhatme. I was fortunate to have their friendship and mentorship for many years starting from 1954 when I was a 20 year old graduate student lucky enough to have a journalistic pass for 1954 Baroda Congress, journalistically accessing everyone that looked important! It was wonderful to get to know these two wonderful people, solid professionals and solid humanbeings, caring and affectionate.

It is also a great pleasure for me to be here following in the footsteps of a living statistical legend such as Dr. C.R. Rao. His talk has emphasized data mining, and