

**RESULTS OF THE SURVEY ON FOLLOW-UP
INITIATIVES OF THE UN/USA GNSS
REGIONAL WORKSHOPS AND
INTERNATIONAL MEETING OF EXPERTS
:2001-2002; ENVIRONMENT AND
DISASTER MANAGEMENT**

BY

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PRESENTATION LAYOUT

- **Introduction**
- **Initiatives Addressing The Various Recommendations**
 - *Integrate The Use Of GNSS Into Environmental Monitoring and Disaster Management as well as into hydrology and flood prediction systems*
 - *Environmental Monitoring*
 - *Hydrology And Flood Prediction*
 - *To Use GPS To Monitor Landslides and Volcano*
 - *To Monitor And Map Animals And Insect Behaviors For Early Warning of Extreme Climate Events*
 - *To use GPS to manage the Forests*
 - *To Use The GPS To Manage Environmental Pollution*
 - *Cross cutting initiatives*
 - *Training*
- **Summary And Conclusion**

INTRODUCTION

- The Global Positioning System (GPS) satellites were first developed to determine the location of a person or place.
- Taking advantage of the capacity of the GPS to determine locations and the interaction of the GPS signals with substances in the atmosphere, the use of GPS has been extended to various aspects including environmental monitoring and management.
- The GPS is also extensively used in monitoring the vertical profile of the atmosphere and mapping pollution, flooding, forests, and fire among many other areas of applications.
- This report is a compilation of the results from the questionnaire responses and information obtained from the internet

Environmental Monitoring

- This area had eleven initiatives
 - *Estimation of Water Vapour in a Column based on attenuation of the GPS signals(six initiatives)*. The approach is a promising potential for improving weather and climate monitoring and prediction, climate change monitoring and detection, hydrology and all other activities affected by weather and climate. The method is, however, dominantly being researched on in the developed countries. Through **collaboration, training and provision of the necessary tools**, the developing countries, frequently affected by droughts and floods, would benefit from this approach.

Environmental Monitoring (cont'd)

- *Monitoring sea level and topography(one initiative)*.
The used to monitor the sea level and topography. The method can benefit the coastal initiatives and climate change detection.the small island and coastal hotels would be direct beneficiary of the success of such a project.
- *Monitoring tropical cyclones(1 initiative)*
GPS Meteorology technique to monitor Precipitable Water Vapor(PWV) was used to monitor Typhoon RUSA, in Korea peninsula during 30 August to 1 September, 2002. .

Environmental Monitoring (cont'd)

- *Global navigation satellite system project for COMESA/EAC.*

The project is intended to enhance aviation safety. The tendering for the study has been concluded and it was agreed that the study include environmental monitoring. The project will benefit aviation and environmental monitoring (Update from the East African Community (EAC) and (COMESA)).

- *Atmospheric sounding*

Joint procurement of GPS radiosondes.

A follow-up meeting is scheduled in Geneva from 23-26 November 2003. The *assistance* required is for the OOSA to inform the manufactures of the difficulties is experienced with the developing countries and the joint procurement mechanisms being considered.

Hydrology And Flood Prediction

- **Two initiatives**
- Flash Flood Prediction In The Tropical Pacific: A University Of Hawaii And National Weather Service Research Collaboration.
- Mapping the Wet land regions of the Country to aid and boost rice production and delineate flood vulnerability regions.
- The beneficiaries of these initiatives include disaster managers and agriculture.
- Assistance required from OOSA is funding.

Using GPS To Monitor Landslides and Volcano

- Three initiatives
- Using GPS in Monitoring Sierra Negra volcano. This project is a collaboration between the University of Idaho, Darwin Research Station, Galapagos National Park, and UNAVCO
- **GPS Deformation Monitoring of Greater London and the Thames Estuary** –the project puts in place a network of stations for use by the Environment Agency, for the long term monitoring of subsidence in ground level well into the next century. The monitoring itself will be based on measurements involving GPS navigation satellites. Should the technique prove effective, it could be used for monitoring long term changes in regional ground level in other areas of the world, which are likely to suffer from mining subsidence, seismic activity, or flooding

Using GPS To Monitor Landslides and Volcano(cont'd)

- GPS Technology was used to assess the *environmental damage caused to the reefs due to grounding vessels*. The same technology is also used to monitor erosion and reef degradation. **Funding is a major problem.** UN/OOSA may wish to consider supporting a pilot project.

*To Monitor And Map Animals And Insect Behaviors For
Early Warning
of Extreme Climate Events*

- Three initiatives
- Studies using GPS to monitor wildlife have been conducted in Egypt. Papers on the results of the findings were presented at the First International Egyptian Conference of Protected Areas, Savoy Hotel, Oct. 2002, Sharm El Shiekh, Egypt and will be in scientific journals soon.
- Studies on traditional climate monitoring practices in Kenya
- Use of GPS to monitor wildlife in Game Parks in Kenya-Financial support for a pilot project by UN/OOSA requested .

To use GPS to manage the Forests

- Training Opportunity, 2004 GPS for Fire Management
Two Classes; Mammoth Cave NP:
Kentucky, March 1-5, 2004 and Denver,
Colorado: April 19-23, 2004.

Use The GPS To Manage Environmental Pollution

- **Mobile Urban Pollution:** Prototype One-This prototype which is near completion, reads and record GPS position, time from GPS unit, pollution data (CO in parts per million) and temperature(from internet).
- **Non-point Source Pollution Model**-The model will incorporate technology from many sources including Geographic Information Systems (GIS), Global Positioning Systems (GPS), remote sensing satellites, and image analysis software .
- **Determine the Sites of Solid Wastes :-** GPS was used to determine the sites of solid wastes in Homs - Latakia - Tartos - Aleppo. This initiative would benefit solid waste management. The need for more training on using GPS and participation in relevant workshops is observed

Cross cutting initiatives

- AFREF project in the RCMRD member states
- Project for the establishment of Slovak permanent GNSS service

Training

- Master of Science Program and PhD course on Cartographic Science, in which there is a research stream on Geodetic Positioning and Atmospheric Monitoring using GNSS, was added to the program
- Introduction and promotion of the new GNSS systems (EGNOS, Galileo) in Poland and Central Europe
- Awareness on the use of GPS in environmental monitoring, transport and disaster management Kenya

Summary And Conclusion

- This survey has taken consideration of the responses that were posted on the web by Sunday 17 November 2003 and
- the information gathered from the internet.
- It has established the implementation of various initiatives intended to expand the use of GNNS in environmental monitoring and management.
- The efforts are concentrated in the area of water vapour monitoring using the interactions of the GPS signals with the atmosphere.

Summary And Conclusion(CONT'D)

- A total of seven (7) initiatives were observed to address the use GPS to monitor atmospheric water vapour. the findings were mainly obtained from the internet
- The area seems not to have been explored in the developing countries possibly due to the accessibility to the required data, necessary infrastructure and inadequate training.

Summary And Conclusion(CONT'D)

- The majority of the initiative in this area are under implementation. It is important to mention that efforts in this area will benefit a wide spectrum of the scientific community involved in the monitoring of weather/climate, environment hydrology and other related sciences. .

Summary And Conclusion(CONT'D)

- Efforts should be made to explore the possibility of extending the method to developing countries to support meteorological services and environmental monitoring and management for sustainable development and disaster management

Summary And Conclusion(CONT'D)

- Other responses were on environmental degradation, floods, land slides and volcanoes, forests, pollution and sampling vertical profile of the atmosphere.
- Majority of initiatives in this area were in the development stage and are affected by lack of funding and inadequate awareness on the potential of the GNSS in these activities

Summary And Conclusion(CONT'D)

- Animal monitoring had two initiatives. One of the initiatives implemented in Egypt, is expected to have been concluded in April 2003. The initiative in Kenya has not been implemented due to lack of funding.
- Many responses indicated the need for awareness raising activities and simplified user-based materials to support awareness raising needs.
- Mapping of hazards such as fire fire, floods and volcanoes, which often evolve into disasters.
- I am aware that GPS is extensively used in search and rescue which an activity in support to disaster management

Summary And Conclusion(CONT'D)

- In conclusion, *I wish to indicate that the GNSS has a high potential in the monitoring and management of the environment.*
- *The difficulties dominating this area were inadequate awareness, lack of funding and lack of tools and expertise to explore the GPS potential.*
- *There is, however, a need for training in this area, pilot demonstration projects, awareness raising and collaboration research.*
- I thank the UN/OOSA for giving me this opportunity to participate in the survey and the expert discussions

END

THANK YOU AND GOD BLESS.