Geospatial Technologies for Monitoring Forest-Atmosphere Interaction

Group Name: The Maverics

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Date	Topic name	Learning outcomes	Learning activities / Assignments	Basic learning materials
Day-1 13.03.20	**Introduction to forest-atmosphere interactions**	• Understand the links between forest ecosystem and the atmosphere • Know the state of science in the field of forest-atmosphere interaction and issues related with it • Know the parameters/variables involved in the interaction process	**Morning Session**: • Think-Pair-Share on the Topic • Lecture on the forest-atmosphere interaction **Afternoon Session**: • Reading and discussing review papers in a group • Listing important variables/parameters involved in forest-atmosphere interaction	• Lecture by Expert/Professor • Scientific review Paper related to topic • IPCC Special Report on Climate Change and Land • Influence of forests on environment (http://www.fao.org/3/XII/1018-B2.html) • Climate impact on forest (https://19january2017snapshot.epa.gov/climate-impacts/climate-impacts-forests_.html)
Day-2 14.03.20	**Excursion to Pendjari National Park, Benin**	• Obtain field knowledge of current situation at the National Park • Know the issues affecting the forest (deforestation, desertification, land degradation and forest fire) and their relationship with climate change • Know the different methods of data collection in the forest	**Morning Session**: • Interaction with park officials • Talk from expert on the forest conservation issues **Afternoon Session**: • Demonstration on forest monitoring and data collection tools like Unmanned Aerial Vehicle (UAV)	• Presentation from Park Authorities • National Park Information Pamphlets with Maps • Annual Report of National Park
Day-3 15.03.20	**Introduction to Geospatial Technologies and Climate Data Sources**	• Know the basic concepts (spatial reference system, projections and coordinate systems and applications of GIS, and GPS • Know the basics of satellite remote sensing, sensors and resolution • Know the different sources of remotely sensed and climate data and able to download them	**Morning Session:** • Lecture on basics of Geospatial Technologies • Lecture on climate data sources and data formats and exploring the data sources **Afternoon Session**: • Demonstration on downloading and visualizing the data using software like R and QGIS	• Presentation on the topics • Tutorial Videos on data downloading • User manual of software (R and QGIS) **Data source links:** ➢ https://earthexplorer.usgs.gov/ ➢ https://ladsweb.modaps.eosdis.nasa.gov/search/ ➢ https://www.gleam.eu/#1 ➢ https://pmm.nasa.gov/precipitation-measurement-missions ➢ https://cds.climate.copernicus.eu/cdsapp#!/search?type=dataset ➢ https://esgf-node.llnl.gov/search/cmip6/
Day-4 16.03.20	**Project Work**	• Know the options and technical methodologies of analysing different environmental and atmospheric variables • Able to use geospatial technology in forest management	**Morning Session:** • Analysis and interpretation of provided datasets (precipitation, temperature, soil moisture, evapotranspiration, leaf-area index, vegetation cover) for the national park **Afternoon Session:** • Continuing the morning session task	• Computers with installed software: R and QGIS • Book/Reading Material : An Introduction to Statistical Learning - with Applications in R by James**, G.,** Witten**, D.,** Hastie**, T.,** Tibshirani**, R.**
Day-5 16.03.20	**Group Discussion and Presentations**	• Able to use remotely sensed and climate data in forest monitoring and conservation • Able to formulate methodology to solve provided research question • Able to critically reflect and evaluate the product of their project work	**Morning Session:** • Distribution of research topics among the groups • Guided group discussion **Afternoon Session:** • Presentation of the methodology to solve a particular research problem using the various datasets • Discussion and feedback from experts	• Research topics: Relation of land degradation, deforestation, desertification and wildfires with atmospheric condition • Presentations from participants