

Forest DRAGON 3

European PI(s)

Prof. Christiana SCHMULLIUS, c.schmullius@uni-jena.de

Prof. Barbara KOCH, barbara.koch@felis.uni-freiburg.de

Chinese PI(s)

Prof. LI Zengyua, Zengyuan.li@forestry.ac.cn

Prof. ZHANG Xiaoli, zhang-xl@263.net

The overall goal of the FOREST DRAGON 3 project is to advance understanding in forest ecosystems mapping within China. In addition, methodological developments towards the synergy of different sensors and techniques are proposed. Furthermore, a profound study will be carried out, in which a Decision Support System (DSS) will be built around web services providing decision-support on the mixture of eco-system services in local to regional scale integrating space and airborne remote sensing data. The eight objectives of the FOREST DRAGON 3 project are 1) the investigation of scaling effects in forest ecosystem mapping with SAR data, 2) the long-term analysis of forest GSV and forest structure over Northeast China based on SAR data, 3) linking forest DRAGON products with existing land use, land cover and/or fire products and 4) the synergy of optical and radar data for mapping forest ecosystems, 5) adapt current forest mapping algorithms to Eastern Russia, 6) adapt current and develop new forest mapping algorithm in Continental Southeast Asia, 7) use the Sentinels-1/2 data for forest map updating, 8) developing a modelling approach for forest services using space data as input for multi-criteria DSS in mountainous forests in China using earth observation. Under-pining the models will be the technology of remote sensing and existing spatial geo-data to establish or/and enhance forest, land cover and landform information. The project will deliver theoretical results as well as wall-to-wall maps of forest parameters for China and neighbouring countries. Furthermore, this study will result in a new methodological base for DSS in forest resource management for mountain forest areas in China. This will be pursued through a case study in pilot region(s) in E and NE China. As a result of Objective 1, a thorough analysis of scaling effects in forest structure mapping and forest GSV mapping at different spatial resolutions will be delivered. The outcome of Objectives 2 and 3 includes validated forest GSV and GSV change maps for the years 1995-2005-2010 and possibly 2015 for Northeast China. The products will be generated in close cooperation with and will be exchanged with other DRAGON 3 teams involved in vegetated ecosystems analyses. In addition, methodological procedures for (i) improving and/or validating Forest DRAGON maps with other DRAGON products or several land use or land cover maps and (ii) for validating forest GSV change by means of fire emission data will be presented. This work will be linked to DRAGON 3 proposals for rice and crop mapping, fire monitoring and atmospheric pollutants. The deliverables for Objective 4 include methodological procedures (i.e. a Sentinel-Procedure) for monitoring forest ecosystems using different sensors (optical, radar) synergistically at different temporal and spatial scales in accordance with GEOSS requirements. Objective 5 and Objective 6 include the analysis of algorithms for forest change detection in tropical forest, the forest GSV and coverage maps, forest change analysis in Eastern Russia and Continental Southeast Asia. The time period will include 1995-2005. Objective 7 deals with algorithms for forest GSV estimation and coverage mapping using Sentinel-1 and Sentinel-2 data, updated 2015 forest GSV and coverage maps for Northeast and South of China, Eastern Russia and Continental Southeast Asia. The system developed based on the objective 8 will trigger a science-based management tool for forests in mountainous areas.

"龙计划"三期项目执行摘要 ID.10666

森林龙计划3期

欧方项目负责人： Prof. Christiana SCHMULLIUS, c.schmullius@uni-jena.de
Prof. Barbara KOCH, barbara.koch@felis.uni-freiburg.de
中方项目负责人： Prof. LI Zengyua, Zengyuan.li@forestry.ac.cn
Prof. ZHANG Xiaoli, zhang-xl@263.net

森林龙计划3期的总体目标是提高对中国森林生态系统制图的理解，提出针对不同传感器和技术的协同新方法，并且通过整合航天和航空遥感数据，深入研究围绕网络信息服务的决策支持系统，以期对局部和区域尺度的生态系统服务的整合提供决策支持。森林龙计划3期的八个具体目标是：1) 基于SAR数据的森林生态系统制图的尺度效应调查，2) 基于SAR数据的中国东北部森林GSV和森林结构的长效性分析，3) 将龙计划的产品与现有的土地利用，土地覆盖和森林防火的相关产品相联系，4) 协同光学和雷达数据的森林生态系统制图，5) 将目前的森林制图算法进行调整使之适用于俄罗斯东部，6) 通过改进现有算法或开发新算法实现东南亚大陆森林制图，7) 应用Sentinels-1/2数据进行森林地图的更新，8) 针对中国的山区森林，应用对地观测获得的空间数据作为多规则决策支持系统的输入数据，研究森林服务的模型化方法，研究的模型可以利用现有的地理空间数据和遥感技术建立或者加强森林、土地覆盖和地形信息。项目以中国东部或者东北地区为试点，为中国或者临近的国家提供理论结果，以及覆盖全部地面的森林参数地图，同时，研究成果将会为中国山区森林的森林资源管理决策支持系统提供新的方法论基础。目标1的结果，将为不同空间分辨率的森林结构制图和森林GSV制图提供深入的尺度效应分析报告。目标2和目标3的成果包括：经过验证的1995-2005-2010年的森林GSV和GSV变化图，并有可能完成2015年的中国东北地区森林GSV和GSV变化图。这些产品将在同其他涉及植物生态系统分析的龙计划三期研究团队的密切合作下完成，或者同他们进行交换。此外，项目还将为以下工作提供方法流程：(1) 通过与其他龙计划或者土地利用、土地覆盖制图产品的比较，改进或验证森林龙计划制图项目产品，(2) 通过利用火灾数据验证森林GSV变化研究结果。这项工作将会同有关水稻和作物分布制图，火灾监测和大气污染的龙计划项目相联系。目标4的成果包括：根据GEOSS的需求，在不同时空尺度综合应用不同的传感器（光学，雷达），进行森林生态系统监测的方法流程（比如：基于Sentinel的方法流程）。目标5和目标6的成果包括1995-2005期间，热带森林的变化监测、森林GSV和覆盖图、俄罗斯东部和东南亚大陆地区森林变化分析的相关算法。目标7的成果包括应用Sentinel-1和Sentinel-2数据的森林GSV估计与森林覆盖制图算法，更新的2015年森林GSV以及中国东北和南部、俄罗斯东部和东南亚大陆的森林覆盖图。基于目标8开发的系统将会建立以科学为基础的山区森林管理工具。