

FOREST DRAGON 2: Advances of Chinese partners during the fourth project year

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During the fourth year of FOREST DRAGON 2 project, the Chinese partners focused on two issues: 1) development and validation of the forest and non-forest mapping method with Envisat ASAR APP data, and 2) forest cover change analysis based on the ERS-1/2 forest / non-forest map (1996-1998) and Envisat ASAR forest and non-forest map (2005). Together with the European partner, we developed an operational method for forest / non-forest mapping using Envisat ASAR HH/HV mode data. The mapping method consists of two parts. First, the SAR images are preprocessed with GAMMA software automatically; the automation is realized by geocoding SAR images for in rugged terrain areas with SRTM DEM and images for smooth terrain areas with Landsat TM images. Second, an object-oriented forest and non-forest classification method is applied to the HH to HV intensity ratio and HV images of ASAR data at single acquisition in winter. We applied this mapping method to the ASAR data acquired in 2005 for Northeast China. The overall accuracy, the user's accuracy and the producer's accuracy of forest are 83.7%, 85.6% and 75.7% respectively. The results indicate that the proposed method is promising for operational forest mapping at regional scale. To investigate forest cover change in Northeast China, we created a forest cover change map at 50 m spatial resolution based on the ERS-1/2 forest / non-forest map (1995-1998) and the Envisat ASAR map of 2005. In general, the forest cover does not change much. Some loss of forest is due to forest fire; this is partly validated by our joint field visit in September, 2011.

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森林龙计划二期：第四年度中方研究进展

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在第四年度, 中方合作者的主要工作集中在两方面: 1) 发展和验证基于Envisat ASAR APP数据的森林/非森林制图方法; 2) 基于ERS-1/2 (1995-1998)的森林分布图和Envisat ASAR (2005)森林分布图监测东北森林覆盖的动态变化。

我们和欧方合作者联合发展了基于Envisat ASAR HH/HV数据的森林/非森林制图的业务化方法。该方法包括两部分。第一, 基于GAMMA 软件自动化处理海量的SAR数据。在地形起伏区域和地形平坦区域分别采用SRTM DEM和Landsat TM图进行地理编码是实现自动化的关键。第二, 基于冬季获取数据的HH/HV极化比值和HV极化图像进行面向对象的森林和非森林分类。将该方法应用于2005年获取的东北ASAR数据, 分类总体精度、森林的用户精度和生产者精度分别为83.7%, 85.6%和75.7%, 结果满足大尺度森林制图的要求。

为研究东北森林覆盖动态变化, 我们基于ERS-1/2森林分布图(1995-1998)和ASAR森林分布图(2005)生成了50米分辨率的变化图。变化分析表明, 中国东北森林覆盖总体变化较少。研究组在2011年9月开展的野外考察证明了部分森林减少的原因为森林火灾。