

利用多源卫星数据提取农田信息支持农业生产管理

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摘要: 当前, 10-30 米分辨率的卫星数据可以免费在线获取, 促进了农业遥感监测技术的快速发展。在中欧龙计划项目的支持下, 中国高分卫星系列和欧洲的哨兵卫星系列的数据为开展农业监测提供了更多的数据源选项。由于中国的农业种植模式是多样性的, 存在大的田块种植单一作物, 也存在小的田块插花种植多种作物, 这个现状成为卫星数据的在农业领域应用的一个制约因子。在应用时, 不得不在卫星数据的空间分辨率和研究区的地块大小之间做出合理的取舍。通常比较而言, 中国的田块小, 欧洲的田块大, 中国研究人员希望使用更高分辨率的卫星数据开展农业监测。此项研究在中国选择了 2 类典型研究区, 一类农田地块很大, 发展现代化农业, 与欧洲的农业生产规模相当, 具有可比性, 另一类, 典型的中国狭小地块, 发展传统农业, 开展农业遥感监测具有更大的挑战性。这些研究区的作物类型包括小麦、玉米、水稻和蔬菜, 代表北方平原区的灌溉农业和雨养农业。项目尝试利用上述中欧及第三方的高分辨率卫星数据监测农田地块农作物生长及农事作业信息, 期望为农业生产管理提供及时的信息支持。通过此项联合研究, 推动中欧年青科技工作者积极参与和交流互访, 在卫星数据处理方法、参数提取算法方面能得到有效交流和互鉴, 从而更好的支持农业监测。

关键词: 作物分类、农业监测、高分、哨兵、龙计划

Retrieving the crop growth and management information at field level with multiple source satellite data for the sustainable agricultural development

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Abstract: The easy access to the high-resolution satellite data at 10-to-30-meter resolution makes the agricultural remote sensing technology develop even faster. Under the support of the Dragon program, the sentinel series satellite in Europe and GF series satellite in China are providing the data options for agricultural monitoring as well as enhancing the capability of agricultural monitoring in general. Because of the diversified cultivation patterns in China, there are existing the big fields with one crop type and the small fields with the mosaic of various crop types. This fact is limited the application of satellite data in agricultural monitoring in China, therefore, the users have to make a compromise between the spatial resolution and the size of study area. In general, it had better use even higher resolution satellite image for crop monitoring in order to adapt to the crop cultivation situation in China. This project has made the great progress since the inception of this project. Two types of study areas were selected. The first one is with big fields and good at the development of modern agriculture that is comparable with the European agricultural farms. Another one is the typic northern Chine fields with the conventional agricultural development that is challenging for the agricultural monitoring with remote sensing data. The crop types in the study areas are winter wheat, crop, rice, and vegetable, representing the irrigation agriculture and rain fed agriculture in northern China. The project used the Chinese and European satellite data and the third partner satellite data to retrieve the crop growth and crop management information at field level in order to provide timely information to improve agricultural management. Through this joint project and the heavy involvement of young scientists from Europe and China, the satellite data finely processing and information retrieval algorithm is being exchanged and it is expected to bring a step forwards to support agricultural monitoring at fine scale.

Keywords: Crop Mapping; Agricultural Monitoring; GF; Sentinel; Dragon Programme