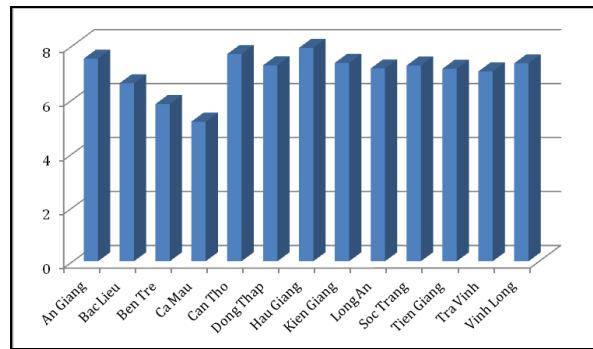
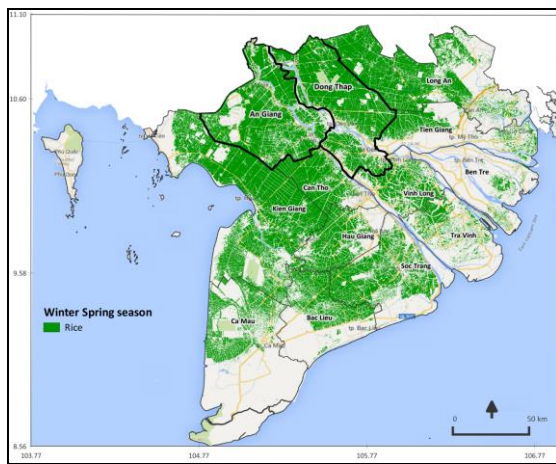


**Assessment of Winter-Spring 2015-16 rice season in the Viet Nam’s Mekong River Delta**

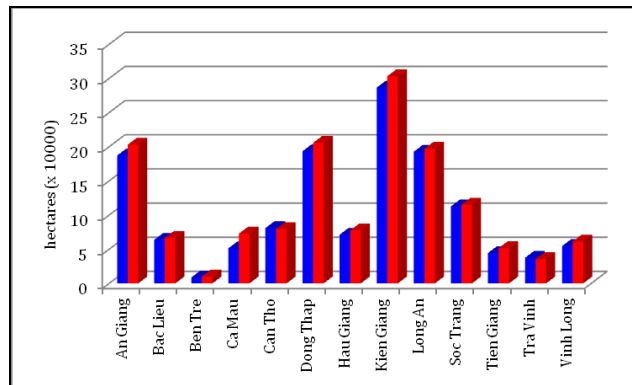
As in most of the South/South-East Asia regions, the Winter-Spring 2015-16 rice season in the Mekong River Delta has been characterized by the limited water availability – river levels at 90 year lows – caused by reduced precipitations since early 2015 and delayed water release of the hydroelectric dams in China. The low water level for irrigation coupled with intensified salinity intrusion aggravated the water salinity condition, in terms of concentration and extent.

Sentinel-1A data acquired every 12 days from September 2015 to April 2016 have been used to estimate the rice area (refer to the map on the left), monitor the rice seasonal dynamics, and, coupled with a rice growth simulation model, to infer yield (refer to the bar chart on the right). It is worth mentioning that yield has been modeled by considering the effect of higher salinity concentration.



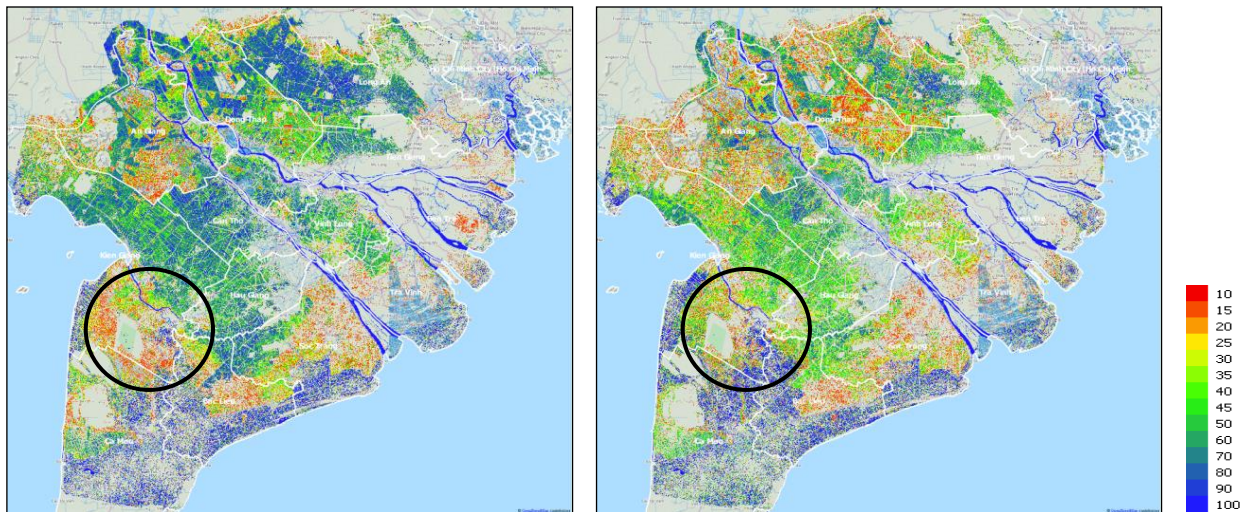
Rice area 2015-16, on the left, and estimated yield (tons/ha), on the right, by provinces.

A comparison of the rice area at start of season between this Winter-Spring season and the previous one (2014-15) confirms an estimated reduction of the rice area of about 7% (i.e. approximately 95,000 hectares), whereas compared to the eleven year average (2000-2011), a 9% rice area decrease is observed (i.e. corresponding to about 136,000 hectares).



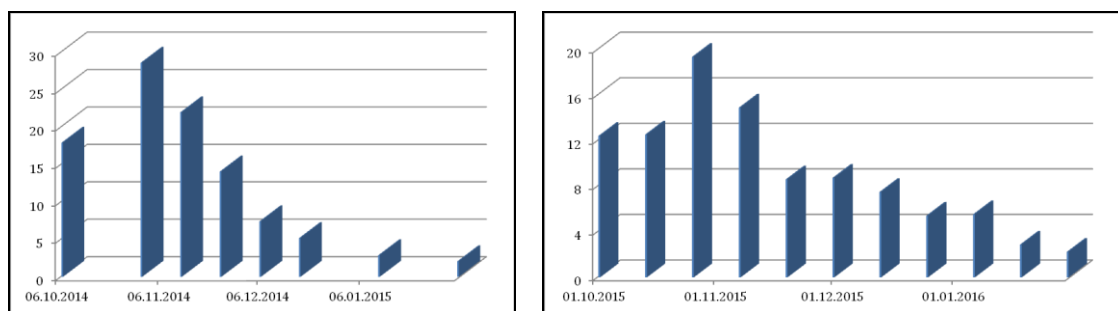
Estimated rice area 2015-16 (blue) and 2014-15 (red) by provinces.

In order to gain a better understanding of this anomalous rice season, Sentinel-1A data has been additionally analyzed by detecting the water conditions along the whole season. In essence, the hypothesis is that if less water is detected, in terms of extent and occurrence, a reduction of the rice area and in particular an impact on the rice production, is expected. Note that occurrence is defined for a given season as the amount of Sentinel-1A data in which water was detected, expressed as a percentage of the total number of images acquired during the whole rice season. The two maps below illustrate the detected water extent and occurrence over the whole Mekong River Delta for the Winter-Spring 2014-15 (left) and 2015-16 (right) season. In the center of the delta, the lower occurrence of detected water condition during the 2015-16 season (around 20% less) is apparent, hence confirming the reduced water availability in the region. It is worth mentioning that in the South and West part of the delta, the dark blue corresponds to shrimp cultivation. An exception to the general trend is represented by the South part of the Kien Giang province (indicated with the circle), where, most probably, there is a rice-shrimp rotation, i.e. farmers decided to utilize the saline water for shrimp farming.



Detected water extent and occurrence in 2014-15 (left) and 2015-16 (right).

Finally, the bar charts below indirectly confirm the reduced water availability in the An Giang province as example. While for the Winter-Spring 2014-15 season, most of the rice sowing/transplanting occurred within one and half month, in the 2015-16 season sowing/transplanting was distributed over a period of three months.



Detected start of season (in percentage of the total rice area of the province) in 2014-15 (left) and 2015-16 (right) for An Giang province.

Information reported in this bulletin has been generated using MAPscape-RICE, Oryza crop model and data acquired by Sentinel-1A (owned by EU and developed & operated by ESA). Background map ©OpenStreetMap contributors.