

Microwave remote sensing studies of De La Plata basin in Argentina

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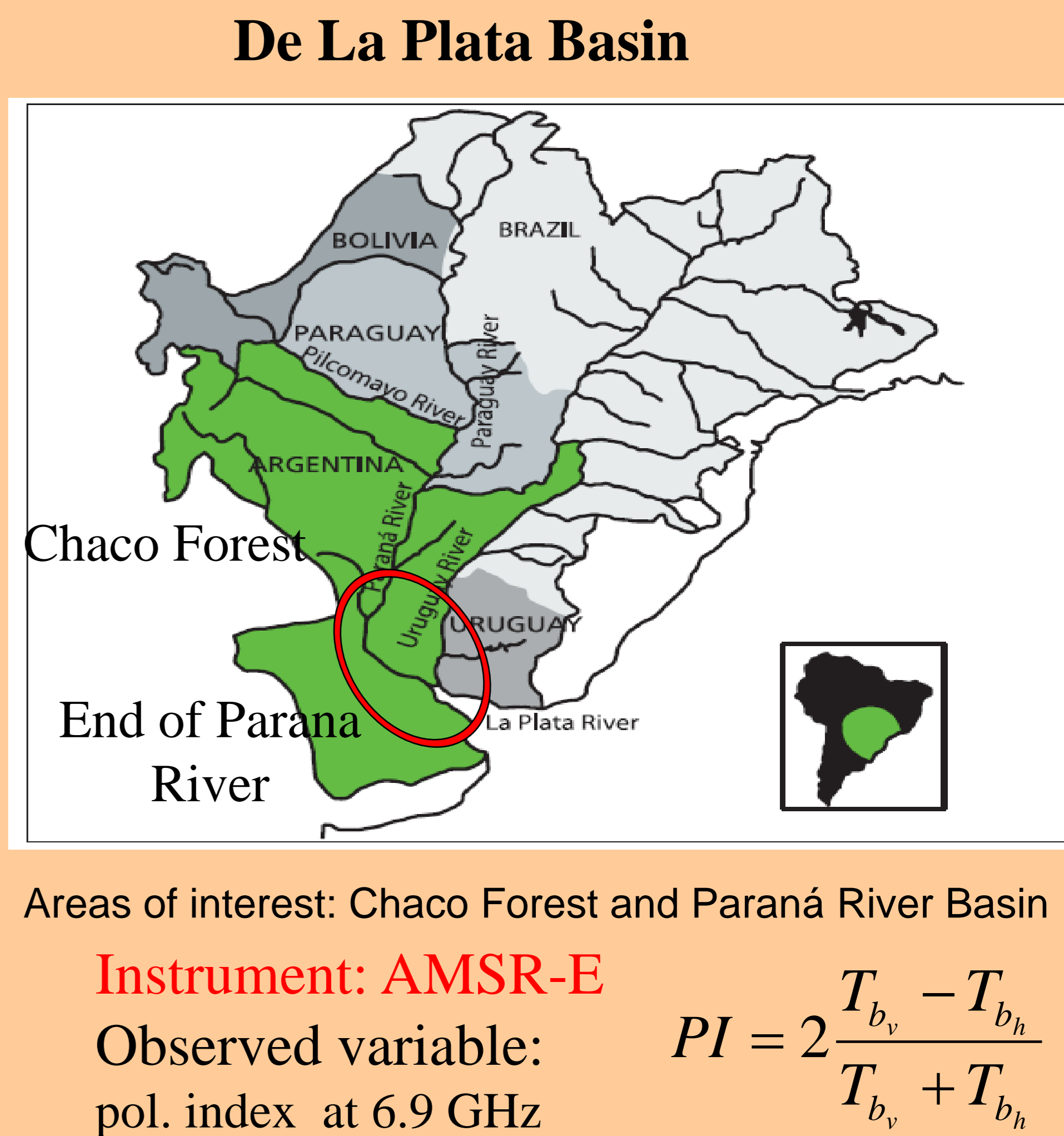


FRAMEWORK

The De La Plata Basin is located in South America and covers about 3.6 million km². It is the fifth largest basin in the world with extensive and important native forest, very productive agricultural areas, wetlands, important human settlements and infrastructure developments. The principal sub-basins are those of the Paraná, Paraguay and Uruguay Rivers. International projects addressing the hydroclimate of the basin, such as La Plata Basin (LPB) project (in progress). Also, several projects addressing smaller areas within the basin are currently in progress related to radar remote sensing in wetlands, and more recently an ESA AO project related to data exploitation of forthcoming SMOS satellite has been accepted. Within this frame, this paper presents the work done and on going, related to radar applications in wetlands of the Paraná sub-basin, and the contribution of passive microwave measurements from the AMSR-E radiometer acquired over the whole basin.

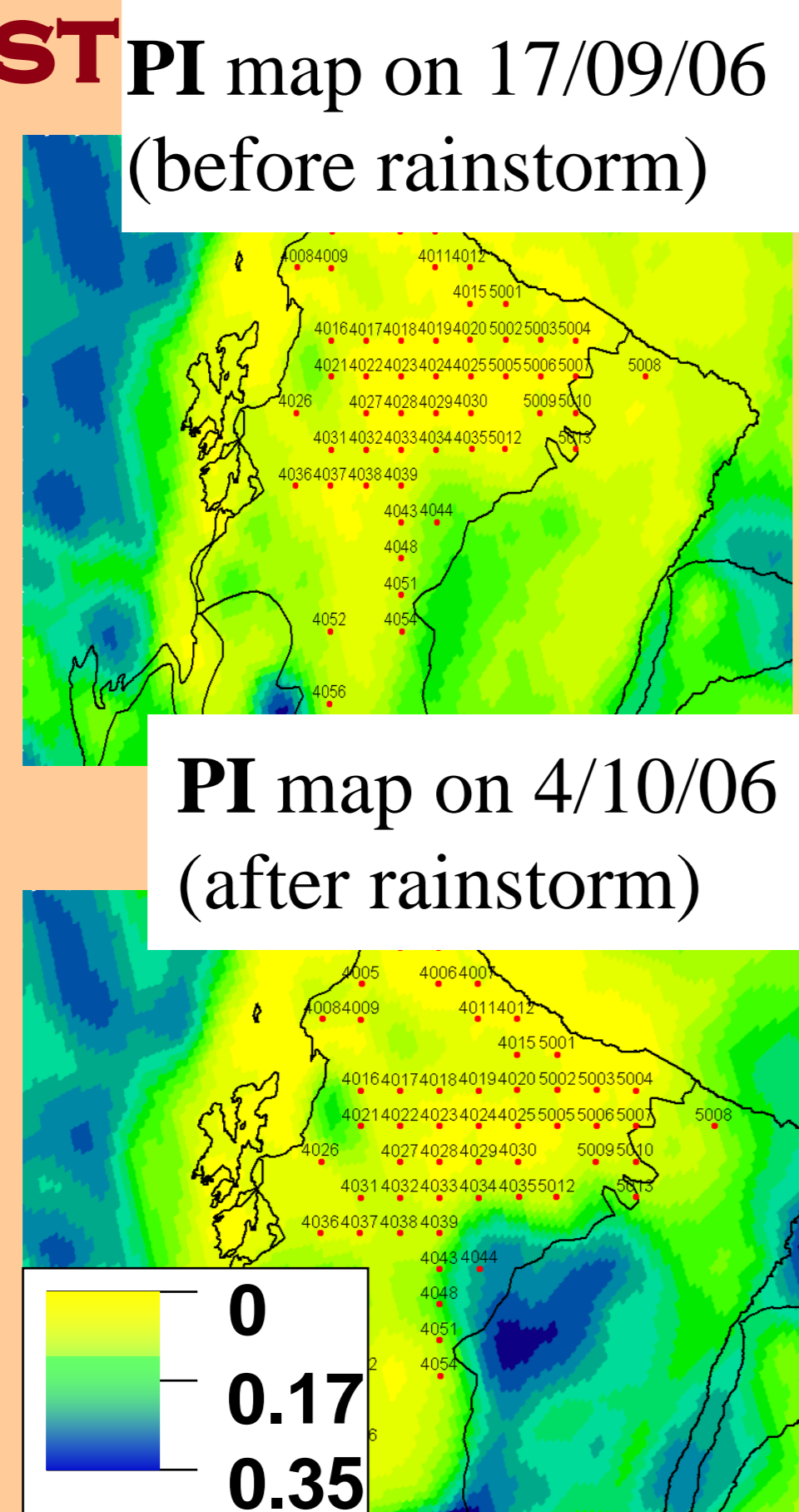
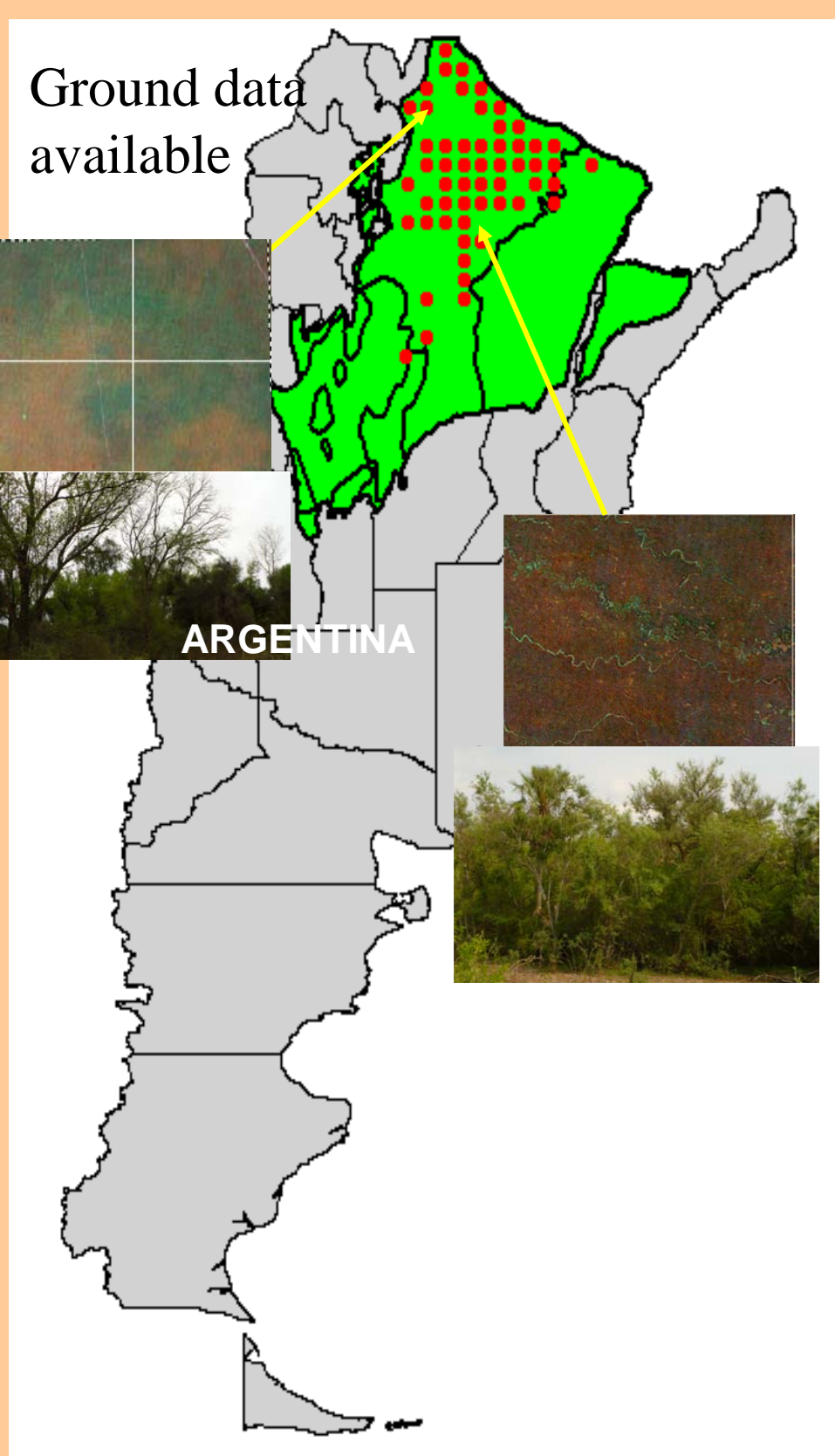
WORK DONE

Active and passive microwave signatures collected over De La Plata Basin, including the Chaco forest, were analyzed. In particular, the multitemporal behavior of the Polarization Index at C band was considered. Within the forest, the PI decreases with increasing forest biomass, but also the soil properties play an important role, and a strong rainstorm produced an appreciable increase of PI, also under an homogeneous and dense forest cover. Along the Parana river, the periodical or unexpected variations of water flux produce evident variations of PI index, well correlated with river flow.

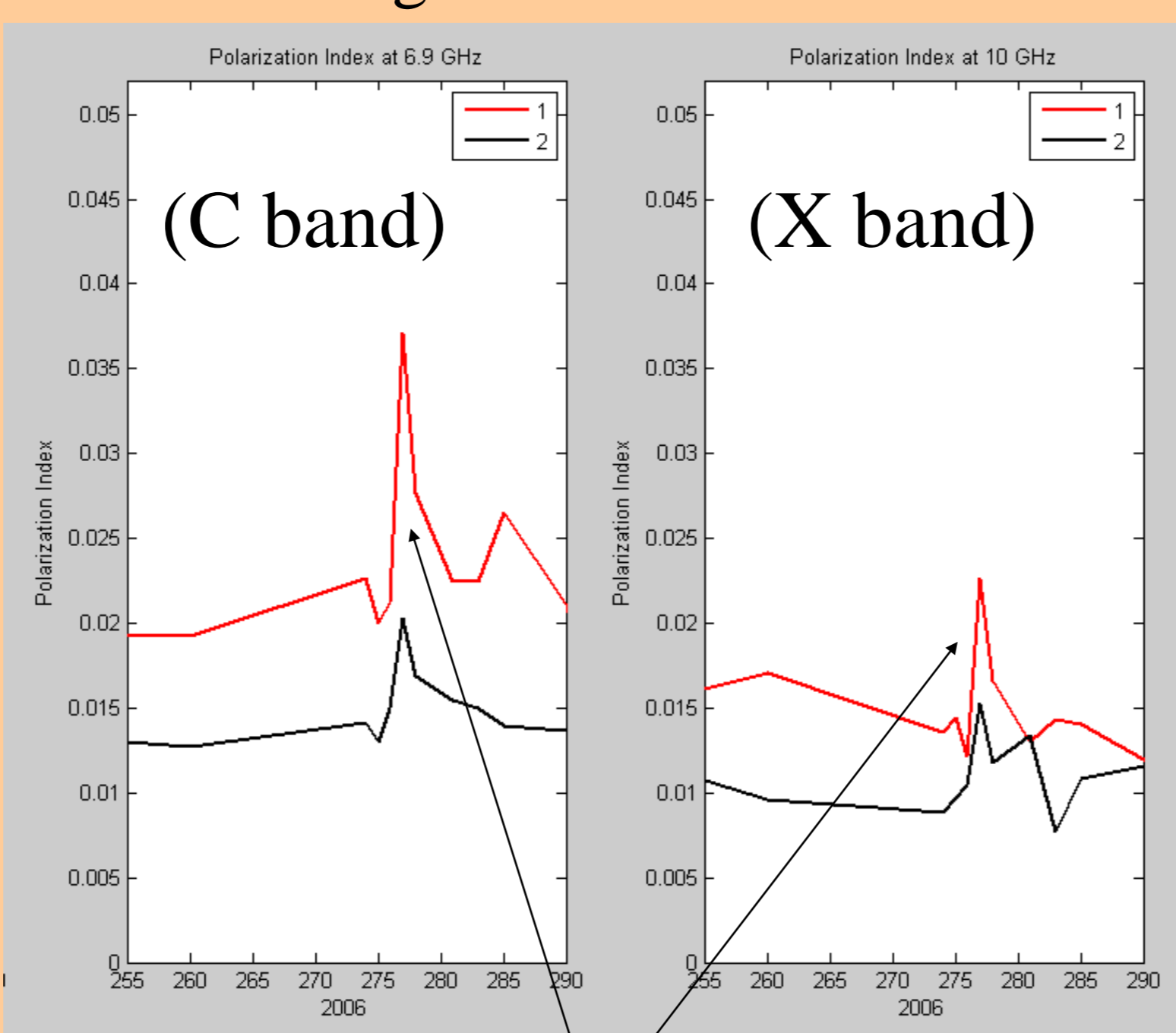


INTERPRETING OBSERVATIONS: AMSR-E

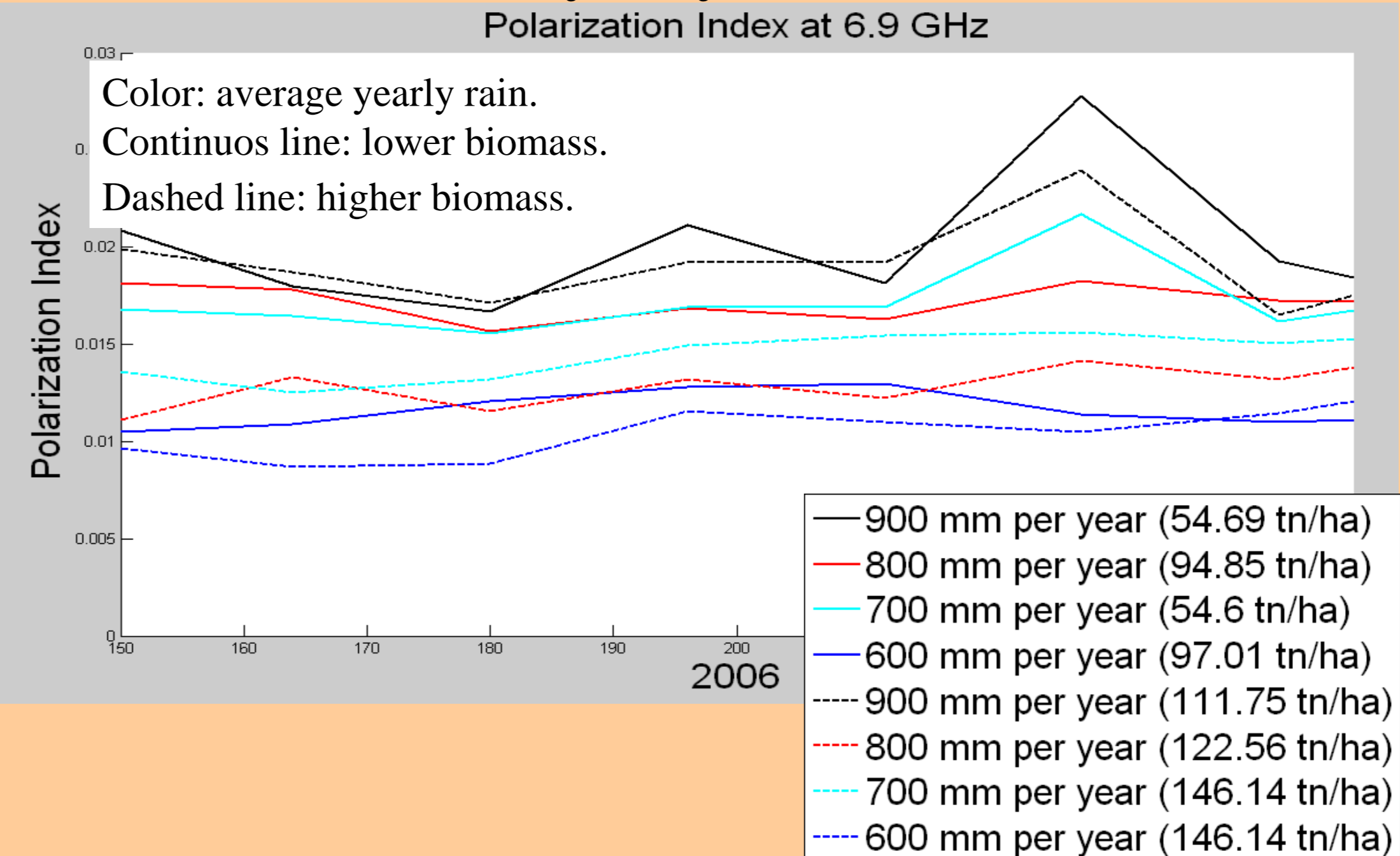
1) CHACO FOREST



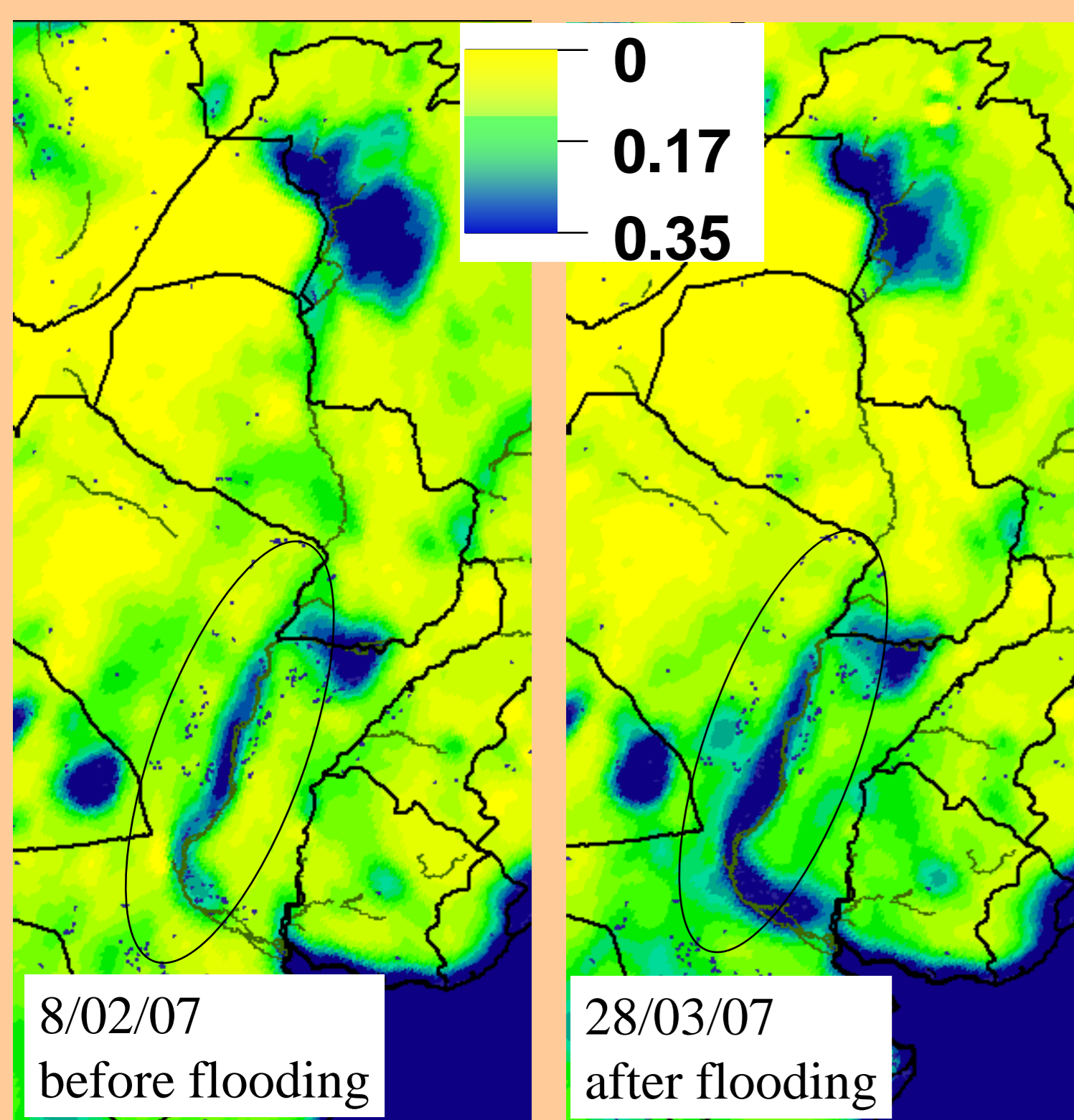
Multitemporal trends over uniform forest areas.
Biomass range: 100-130 t/ha



Combined effects of yearly rain and biomass over PI



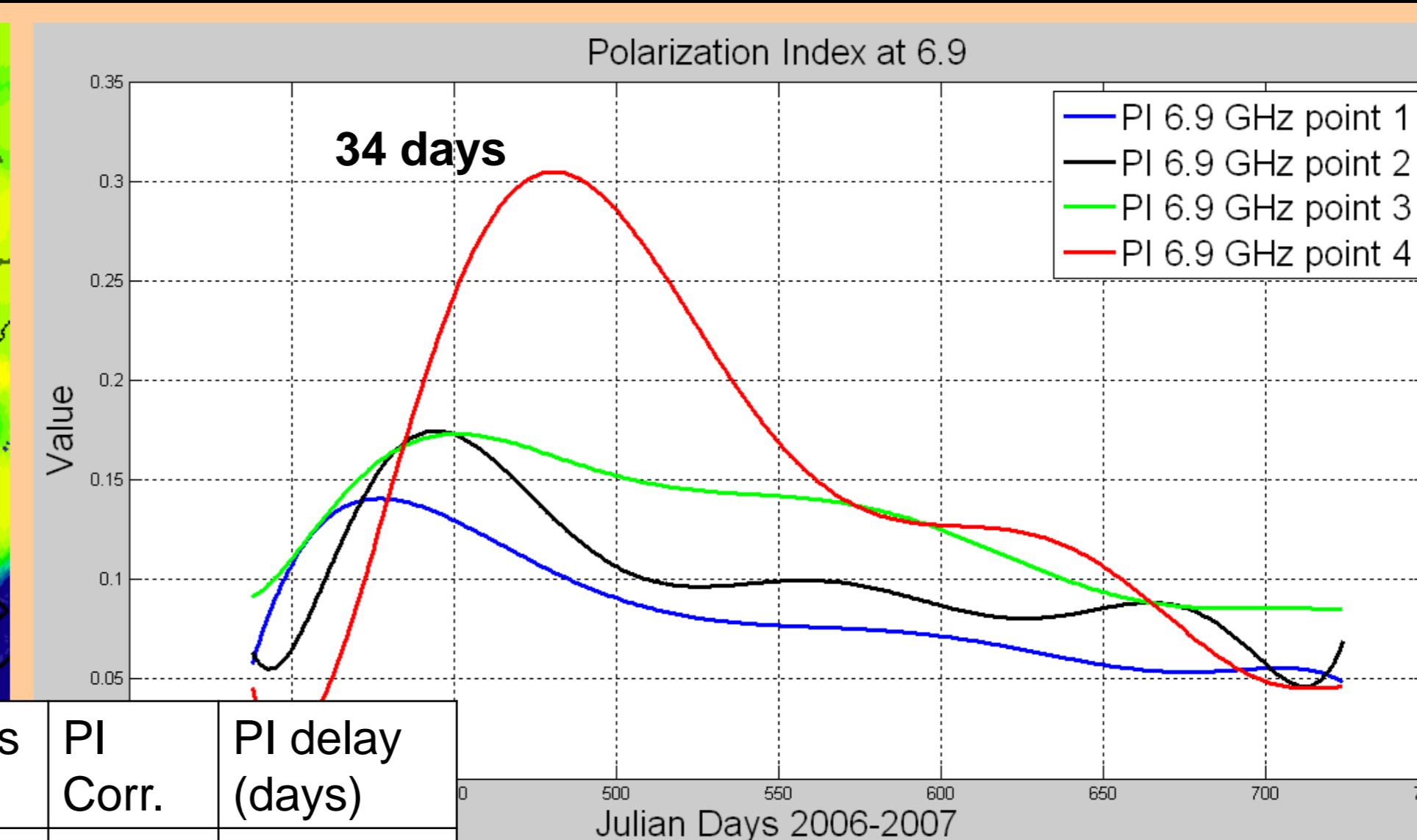
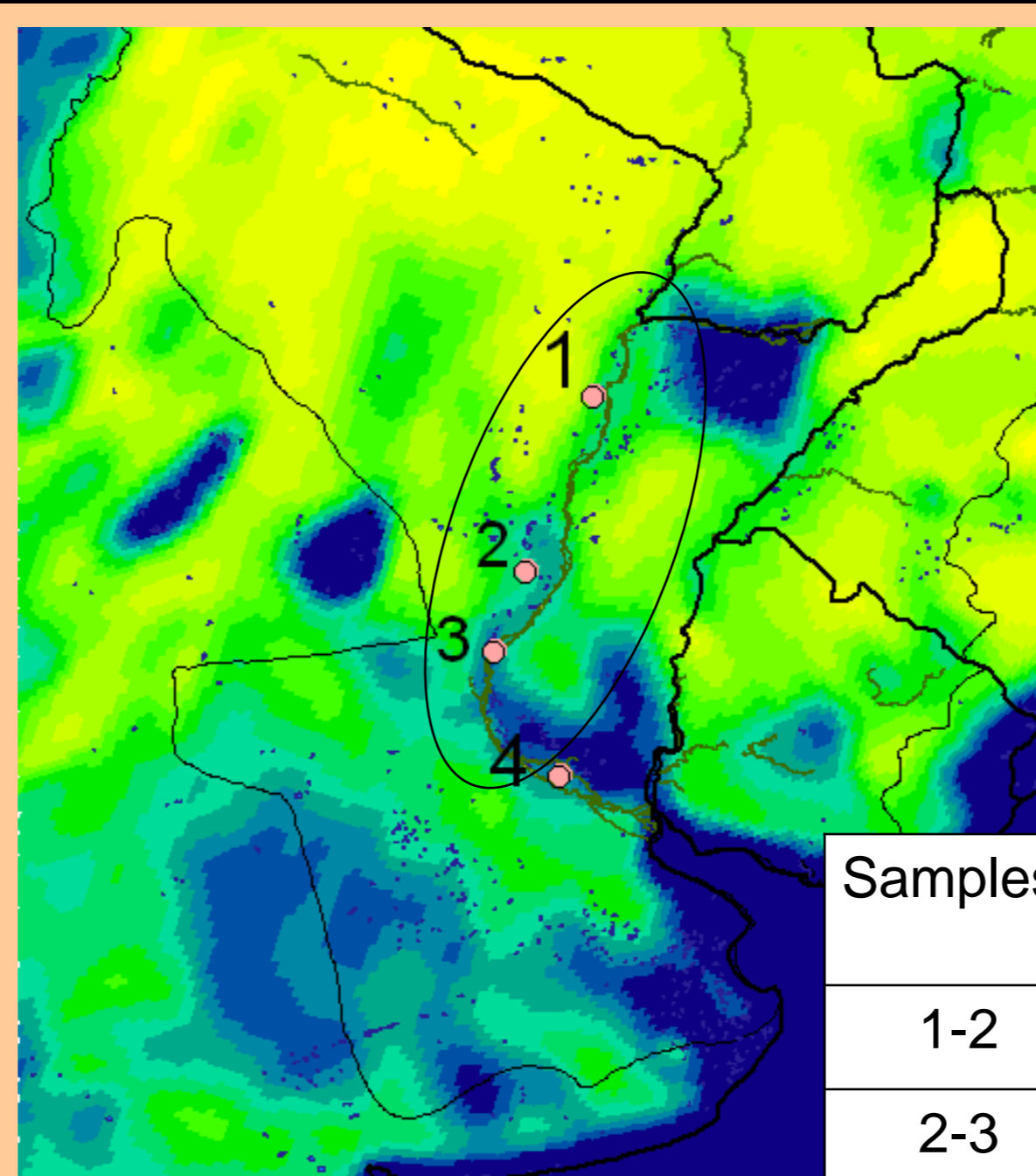
2) PARANÁ BASIN



► Flooding along the Paraná river produces evident effects on PI index

► Single points along Paraná river have been taken and multitemporal trends of PI have been plotted.

► For pairs of samples, the covariance function has been computed. Correlations are good and the delays are well related to river flow.

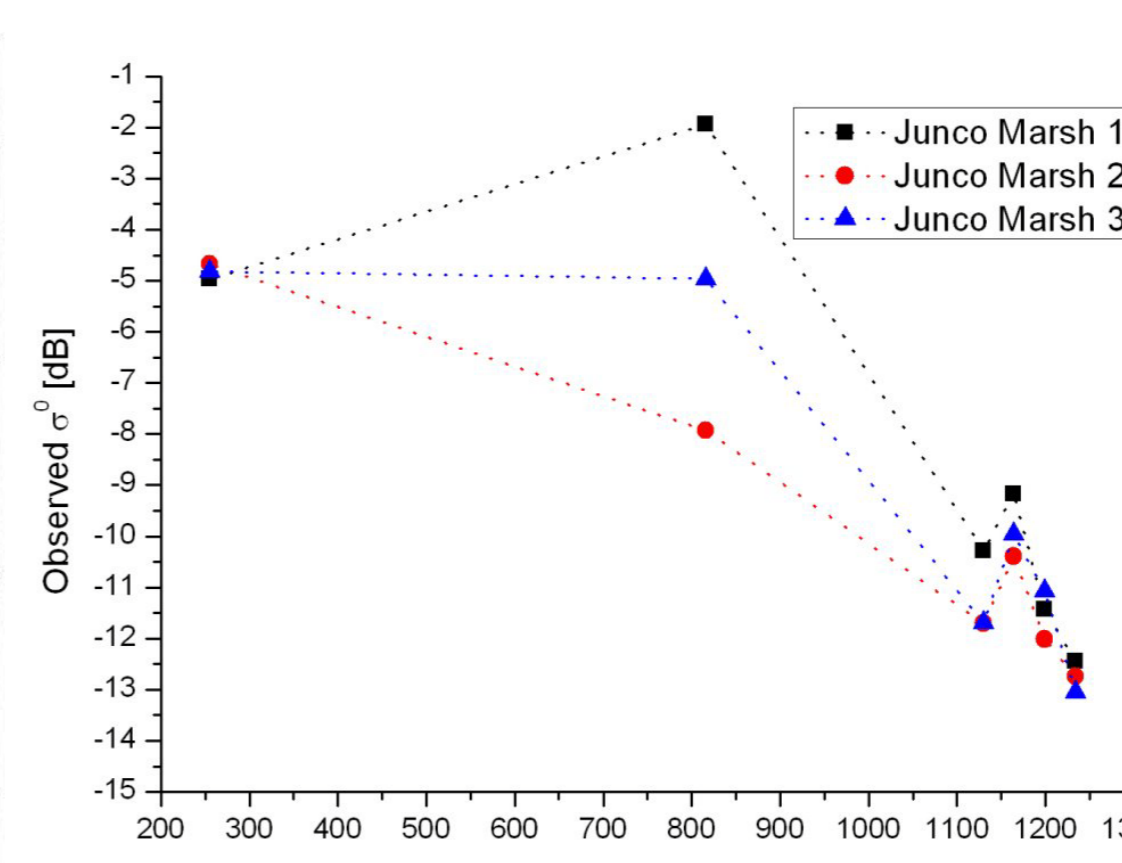
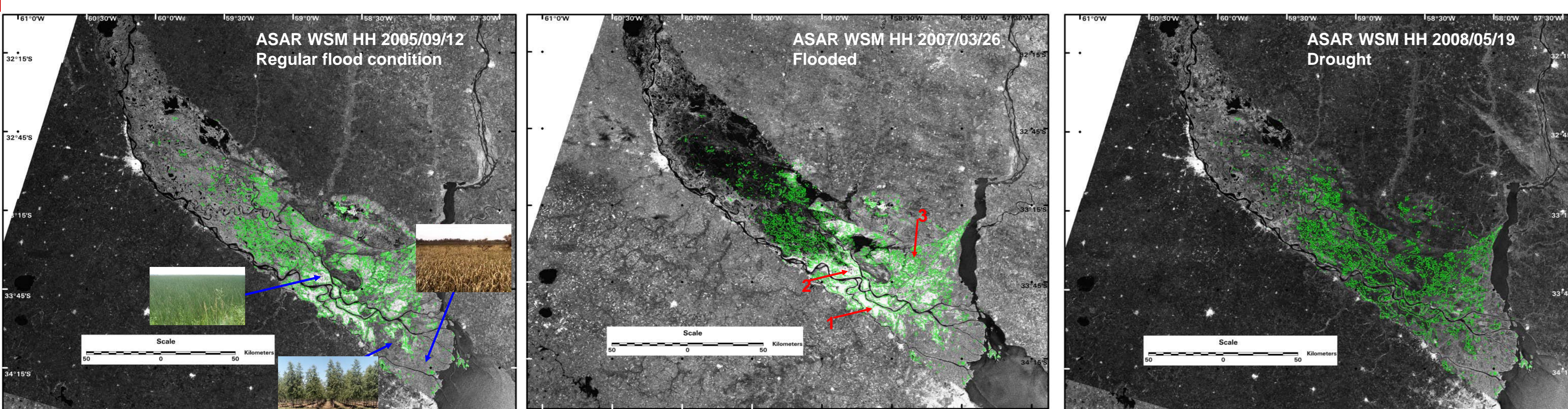


Samples	PI Corr.	PI delay (days)
1-2	0.913	7
2-3	0.857	0
3-4	0.938	18
1-4	0.945	34
2-4	0.9	23

Comments:

The polarization index at C band shows a good sensitivity to soil condition even in forested areas. This is promising in view of future L band systems such as SMOS and Aquarius.

INTERPRETING OBSERVATIONS: ENVISAT ASAR ON PARANÁ BASIN



Comments:

SAR response of junco marshes is a good physical indicator of environmental conditions in this wetland due to the structural characteristics and flood condition of these marshes and the resulting signal-water-vegetation interaction.