

Comparison of NDVI fields obtained from different remote sensors

▶ Juan Escribano Rodríguez ▶ Carmelo Alonso ▶ Ana M. Tarquis Alfonso ▶ Rosa María Benito ▶ Carlos G. H. Díaz-Ambrona
 juanagustin.escribano@upm.es calonso@indra.es anamaria.tarquis@upm.es carlosgregorio.hernandez@upm.es

Grupo de Sistemas Agrarios AgSystems, Departamento de Producción Vegetal: Fitotecnia. ETSI Agrónomos. CEIGRAM. Grupo de Sistemas Complejos, Departamento de Física. Universidad Politécnica de Madrid, 28040 Spain. Remote Sensing Department, Indra Espacio S.A., Madrid, Spain.



Intro

Satellite image data have become an important source of information for monitoring vegetation and mapping land cover at several scales. Beside this, the distribution and phenology of vegetation is largely associated with climate, terrain characteristics and human activity. Various vegetation indices have been developed for qualitative and quantitative assessment of vegetation using remote spectral measurements. In particular, sensors with spectral bands in the red (RED) and near-infrared (NIR) lend themselves well to vegetation monitoring and based on them [(NIR - RED) / (NIR + RED)] Normalized Difference Vegetation Index (NDVI) has been widespread used.

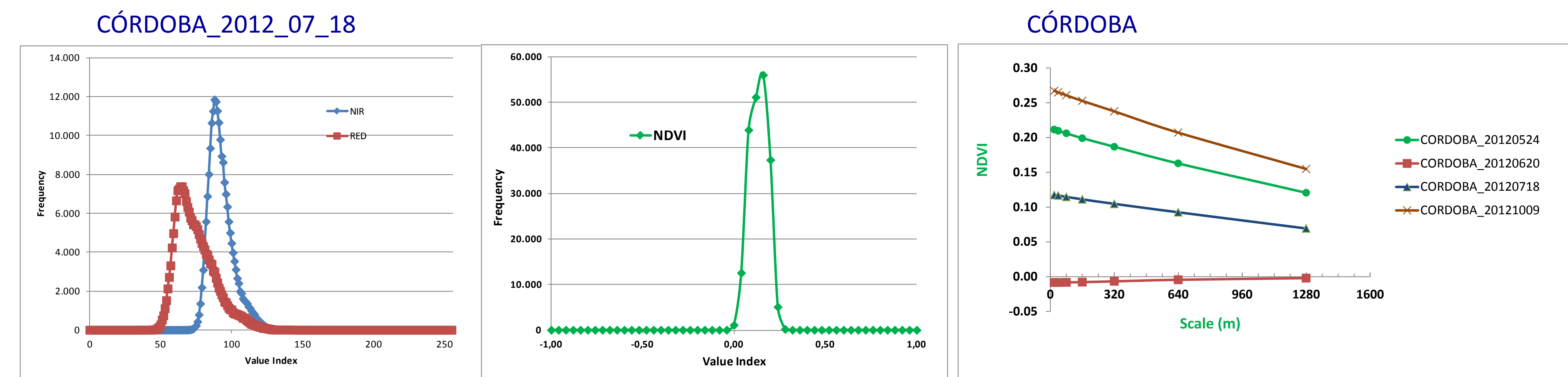
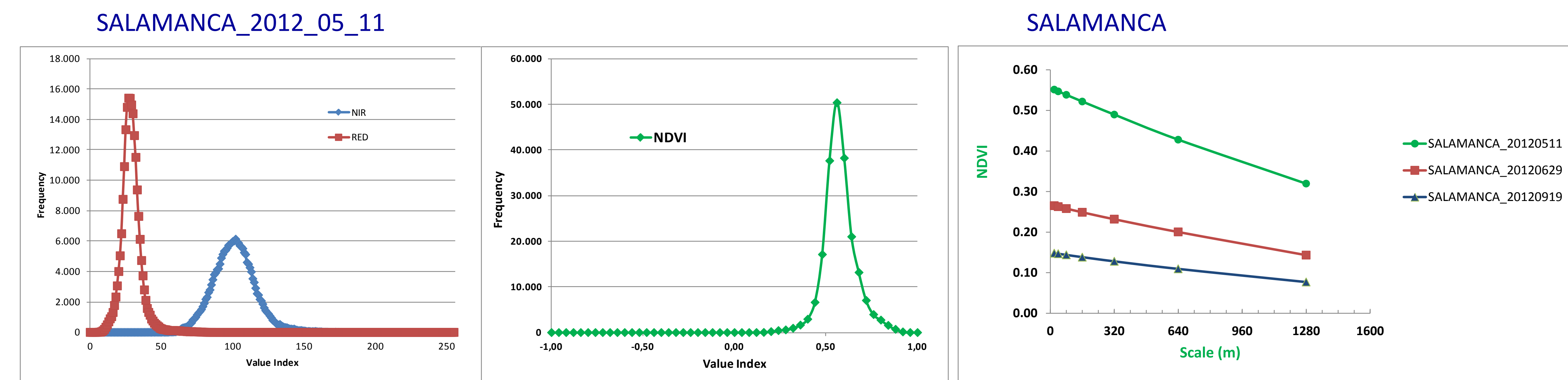
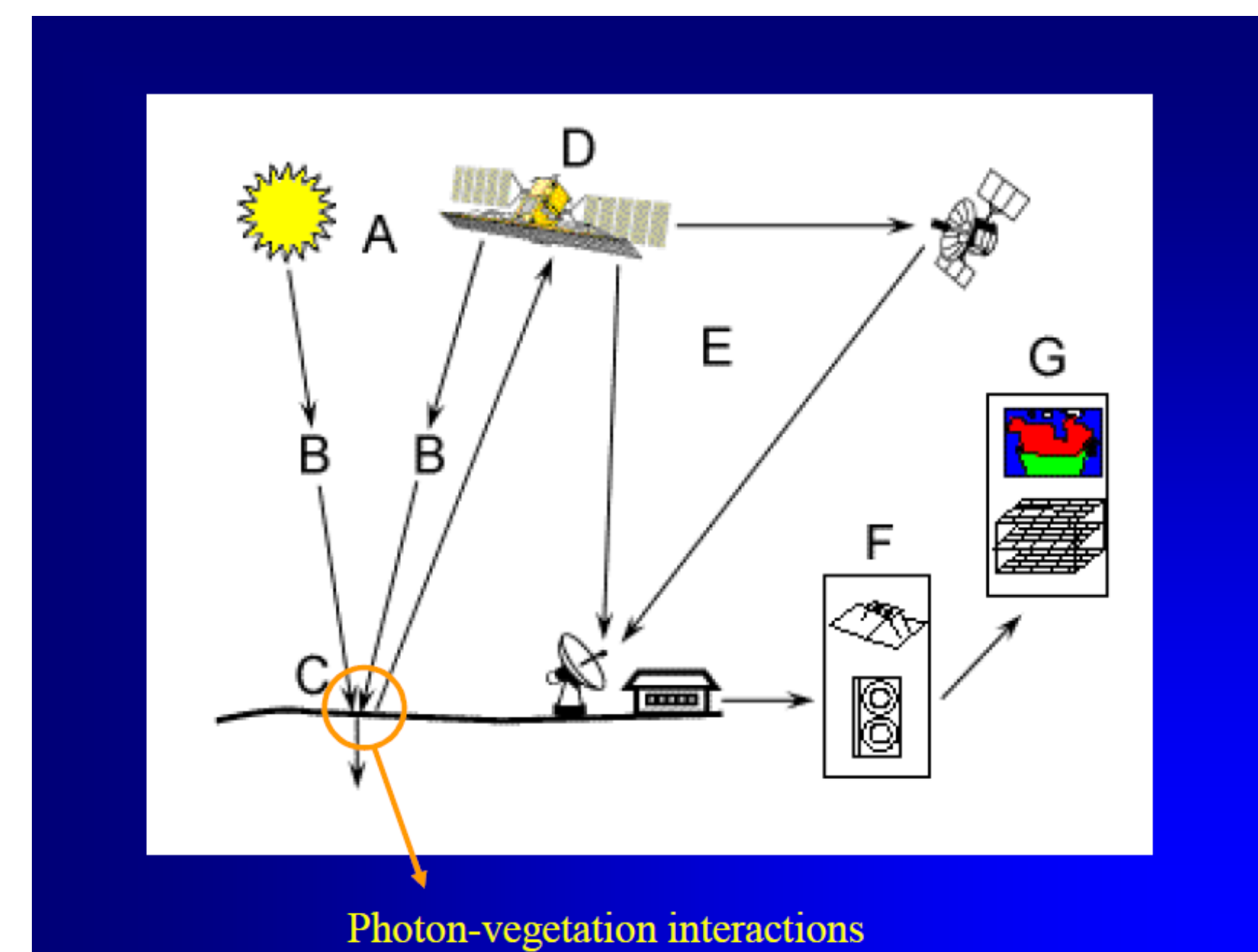
Goal

▶ The aim of this study is to establish a comparison between two different sensors in their NDVI values at different spatial resolutions. ■

Results

IMAGEN	NIR			RED			NDVI			INSURANCE	NDVI NP DEIMOS	NDVI P DEIMOS
	H (q=1)	H (q=2)	ΔH (q)	H (q=1)	H (q=2)	ΔH (q)	H (q=1)	H (q=2)	ΔH (q)			
SALAMANCA_20120511	0.7059	0.6972	0.0480	0.6007	0.6210	0.0181	0.6435	0.6595	-0.0359	YELLOW	0.4097	
SALAMANCA_20120629	0.6349	0.6253	0.0478	0.6801	0.6788	0.0128	0.6734	0.6883	-0.0241	ORANGE	0.1409	
SALAMANCA_20120919	0.5450	0.5664	-0.0139	0.6136	0.6141	-0.0068	0.6451	0.6463	-0.0146	ORANGE	0.2373	
CORDOBA_20120524	0.5827	0.5791	0.0220	0.6399	0.6362	0.0175	0.6810	0.6707	0.0380	RED	0.2874	0.2711
CORDOBA_20120620	0.5419	0.5481	-0.0237	0.6640	0.6581	0.0178	0.7011	0.6671	0.1274	RED	0.1984	0.1977
CORDOBA_20120718	0.4917	0.4987	-0.0222	0.5865	0.5850	0.0049	0.6485	0.6338	0.0470	ORANGE	0.1986	0.1927
CORDOBA_20121009	0.5403	0.5584	-0.0850	0.5868	0.6159	-0.1441	0.6824	0.6821	0.0012	ORANGE	0.3123	0.2535

Method



Histogram of NIR, RED and NDVI for the two field trials in two specific dates

Comparison of NDVI as the scale of the satellite

Field trials in Spanish dehesas

Location ▶

Two areas of Spanish Dehesa in the southwest of the Iberian Peninsula.

Input data ▶

At the same time, remote sensing images were capture by DEIMOS-1 and MODIS of the chosen places. DEIMOS-1 is based on the concept Microsat-100 from Surrey. It is conceived for obtaining Earth images with a good enough resolution to study the terrestrial vegetation cover (20x20 m), although with a great range of visual field (600 km) in order to obtain those images with high temporal resolution and at a reduced cost. By contranst, MODIS images present a much lower spatial resolution (500x500 m).

Maximum NDVI values were obtained when the vegetation of the pasture had higher photosynthetic activity always be greater than 0 and reaching values close to 1. When the scale of the satellite is lower, the NDVI is always greater, while a greater scale the NDVI obtained for the same areas is lower.

Remarks

The estimate of the amount of pasture by remote sensing is more precisely with a smaller satellite scale against another with a larger scale as they have obtained higher values with smaller scale in all field trials and all dates.

Acknowledgments
 This work was partially supported by ENESA under project P10_0220C-B23. Funding provided by Spanish Ministerio de Ciencia e Innovación (MCIINN) through project no. MTM2009-14621 and i-MATH No. CSD2006-00032 is greatly appreciated.