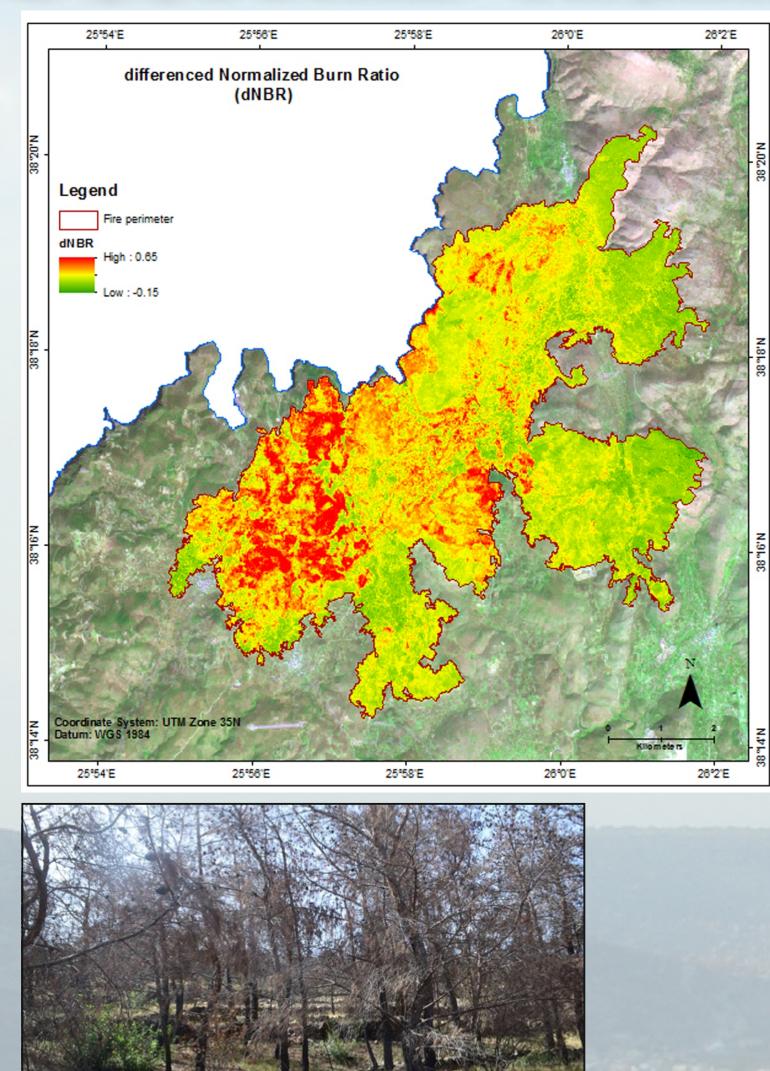
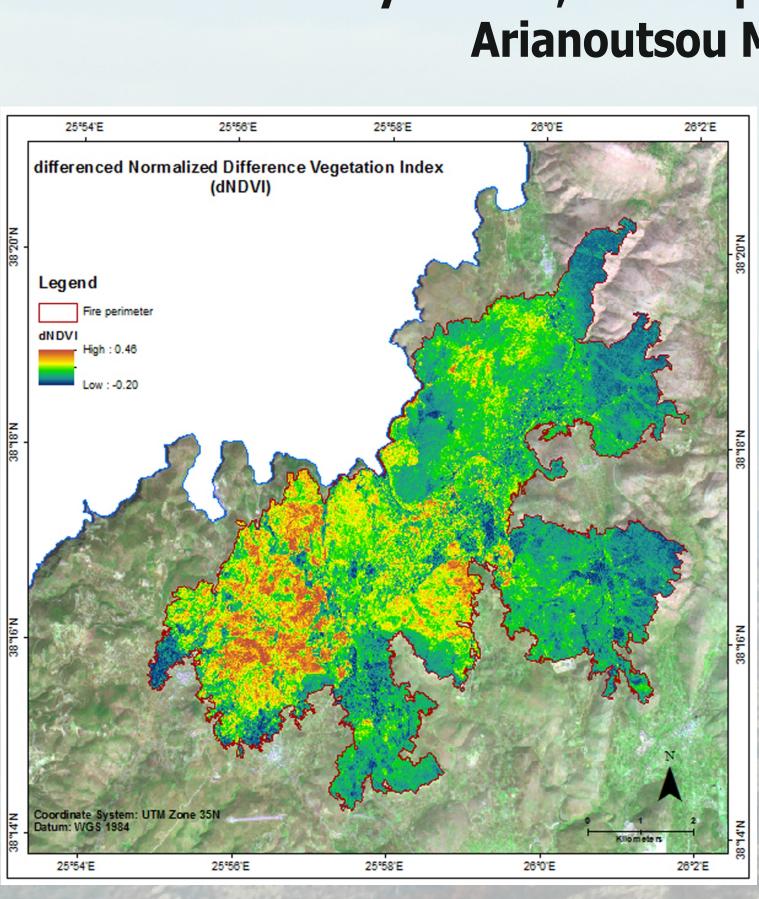
## 25°58'E 25°58'E differenced Normalized Burn Ratio (dNBR) Legeno Fire perimete





Dense canopy Pinus brutia forest that has been burned only once during the last years, with low fire severity.



years, with medium fire severity.



with high fire severity.



Sparse canopy shrublands that were burned twice during the last years, with medium fire severity.



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SS13.58 - Spatial and temporal patterns of wildfires: models, theory, and

Sparse canopy Pinus brutia forest that was burned only once during the last years, with medium fire severity.

## Chrysafis I.<sup>1</sup>, Christopoulou A.<sup>2</sup>, Kazanis D.<sup>2</sup>, <u>Farangitakis G.P.<sup>3</sup></u>, Mallinis G.<sup>1</sup>, Mitsopoulos I.<sup>4</sup>, Arianoutsou M.<sup>2</sup>, Vassilakis Emm.<sup>5</sup>, Antoniou V.<sup>5</sup>, Theofanous N.<sup>1</sup>, Lekkas E.<sup>5</sup>

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emote sensing techniques offer the establishing reference plots in the main pre-fire opportunity to study fire effects and vegetation types (maquis, shrublands and pine vegetation recovery dynamics across forest areas) within the fire-affected area. large areas, providing essential information for

effective management strategies development over fire-prone landscapes. Chios, the fifth by maquis and phrygana (formations of low areas of high risk erosion. shrubs) (40.9%), while pine forests (Pinus brutia) represented 15.5% of the burned area.

series of single and multi-temporal spectral indices including Normalized largest of the Greek islands, has experienced Burn Ratio, Normalized Difference recurring forest fires during the recent years, Vegetation Index, Enhanced Vegetation Index resulting to significant risk of environmental and Soil Adjusted Vegetation Index, were degradation. During the summer of 2016, the derived from multi-temporal Sentinel-2 images. island experienced two severe wildfires, with A random forest modelling procedure was the biggest one recorded in the southern part of performed for estimating post fire vegetation the island. The affected area was mostly covered recovery within the burned area, as well as the

e identified dNDVI, EVI and the second red edge band of Sentinel-2 The aim of this study was to estimate and VV as the most important spectral analyze the state of post-fire vegetation variables for predicting vegetation recovery recovery in the island of Chios following within pre-fire areas. In the case of pre-fire areas major fire events occurred during the summer of with maquis, post-fire NBR, EVI and NDVI were 2016. A post-fire 8-band WorldView-2 image selected as best predictors. Finally, the results was used for burned area mapping by employing revealed that vegetation recovery is more a geographic object-based classification pronounced within the pre-fire pine forest approach, followed by field campaign for areas, while topographic and geological subassessing post fire vegetation recovery, which strata factors were also found significant in was conducted during summer 2017 by defining post-fire vegetation recovery.



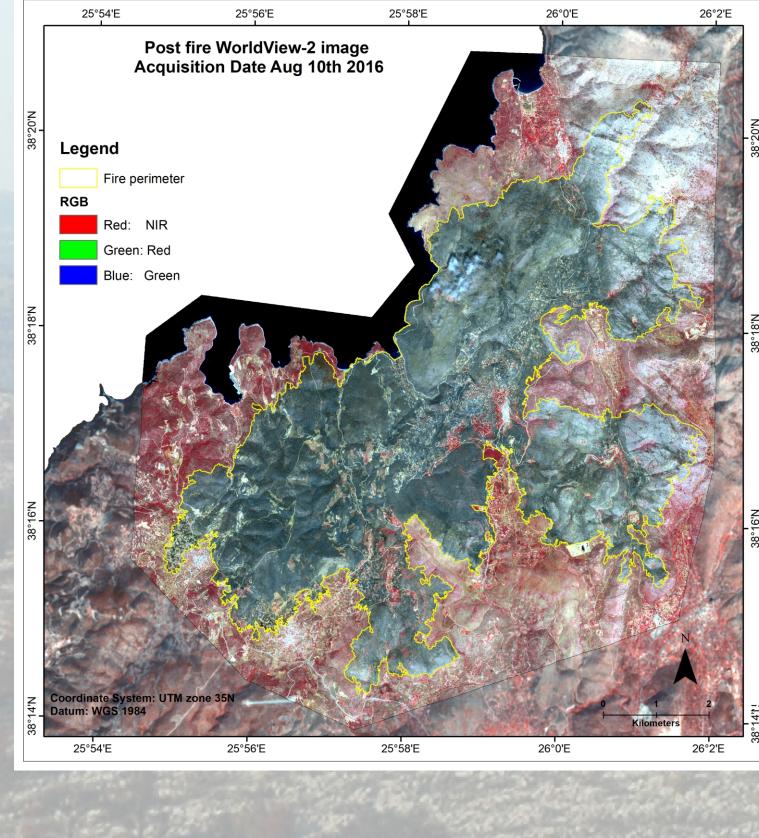
Density of pine seedlings (ind/m2) of this site suggests that the post-fire vegetation recovery will be high enough to result in complete natural recovery (recovery class high). Unburned litter as well as the open cones lying on the ground suggests that fire severity at this site was rather low.

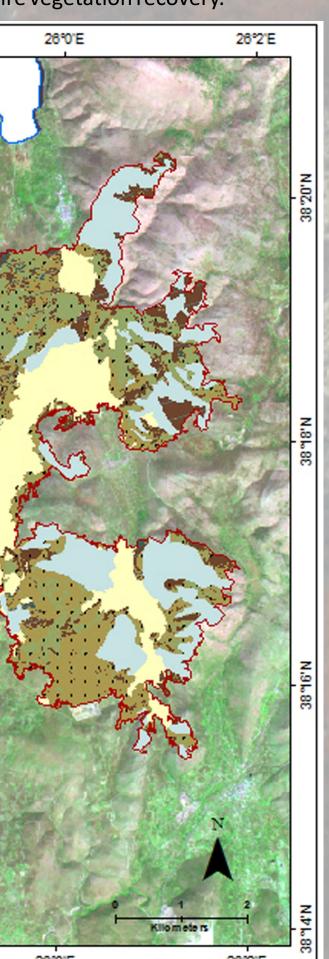
25°54'E 25°56'E 25°58'E Vegetation Recovery map Vegetation recovery Fire perimeter Land cove Agriculture areas Moderate Moderate-high Bare rocks Pastures Other use Pine forest . Shrubland oordinate System: UTM Zone 351 25°56'E 25°58'E 25°54'E Post-fire vegetation recovery assessment was conducted Assessment of post-fire regeneration for *Pinus brutia* forests within the borders of natural vegetation types: Pinus bruria and shrublands, was based on field measurements.

sparse shrubs. Dense shrubs are mostly covered by maquis, presented in the following Table. while sparse shrubs are mostly covered by phrygana.

26°0'E 26°2'E forests and shrublands based on field measurements and Vegetation recovery was classified into four (4) categories remote sensing analysis. Shrubland represent both dense and following specific criteria for each of the vegetation types, as

Criteria used for assessment of post-fire regeneration Pine forests Shrublands Pre-fire canopy cover (sparse-medium-dense) Number of fires (1-2) Number of fires (1-2) Fire severity (low- medium-high) Post - fire regeneration of dominant tree (mean sapling and seedlings density / m<sup>2</sup>)





Pre- fire canopy cover (sparse- medium- dense) Fire severity (low-medium-high) Post- fire cover of woody species (%)





Pinus brutia and Cistus spp. post- fire regeneration by seed germination Seedlings density implies a rather medium recovery level, while black ground, black burned tracks as well as the lack of any litteron the ground suggests that fire intensity at the site was rather medium to high.

with Landsat Thematic Mapper. International Journal of Remote Sensing 32, 3521-3537.

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