



Supplement of

Remote sensing reveals fire-driven enhancement of a C₄ invasive alien grass on a small Mediterranean volcanic island

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Supplement 1 - Selected photos



Fig. S1 - Rhizome of *Saccharum biflorum* (Stromboli, 19 Sept. 2022, credits: Riccardo Guarino).



Fig. S2 - Unburned patch of *Saccharum biflorum*, with plenty of dry biomass that facilitates combustion in case of fire (Stromboli, 19 Sept. 2022, credits: Riccardo Guarino).



Fig. S3 - Resprouted patches of *Saccharum biflorum*, with burned remains of garrigue in the foreground. In the background (right half of the photo), a patch of garrigue fortuitously spared from the fire is visible (18 Sept. 2022, credits: Riccardo Guarino).



Fig. S4 - Chromatic contrast between the burned (below, greyish green) and unburned (above, yellowish) patches of *Saccharum biflorum*. Stromboli, north-eastern flank (18 Sept. 2022, credits: Riccardo Guarino).



Fig. S5 - Resprouted patches of *Saccharum biflorum*, up to the limit of the continuous vegetation. In the foreground, sparse tussocks of *Hyparrhenia hirta*. Stromboli, northern flank (18 Sept. 2022, credits: Riccardo Guarino).



Fig. S6 - View of unburned patches of *Saccharum biflorum* fringing the sand deposits of Rina Grande. Stromboli, south-eastern flank (19 Sept. 2022, credits: Riccardo Guarino).



Fig. S7 - Alluvial deposits in the streets of Piscità, after the storm of 12 August 2022 (credits: Renzo Zaia).

Supplement 2: Correlation between NDVI and dNBR

NDVI is defined as:

$$NDVI(x) = \frac{NIR - RED}{NIR + RED}$$

NDVI is less effective in detecting burned areas because the reflectance in the NIR region of the spectrum is usually higher than RED both in live vegetation and burned areas, although the difference is much reduced in the latter, while reflectance in the SWIR can be higher than NIR in burned areas.

Sensitivity of the red-edge portion of the electromagnetic spectrum to variations in vegetation cover/health is exploited both by NDVI and NDRE (Normalized Difference Red Edge). While NDVI is traditionally more related to the extent of alive vegetation at canopy level, NDRE is more sensitive to changes in chlorophyll content and is useful for assessing vegetation health and stress. Nevertheless, we applied both NDVI and NDRE on images obtained from Sentinel-2 bands (namely band 8 for NIR and band 4 for red) and the figures below show the results of the differential NDVI (left) and NDRE (right) before and after the fire, after optimizing the stretch of the false color map in order for them to match. A visual assessment reveals that, indeed, the maps are comparable. Pearson's correlation coefficient shows that the correlation with dNBR is slightly higher for NDVI:

- Pearson's correlation
 - o dNBR / diff NDRE = 0.973
 - o dNBR / NDVI = 0.977

