Climate change impacts on grassland vigour in northern Portugal

Supplementary material

Table S1. Autochthonous plants found in grasslands of the Côa Region. Data retrieved from the portal Flora.On (https://flora-on.pt).

Family	Taxonomy
Apiaceae	*Daucus carota subsp. carota*
Apiaceae	*Eryngium campestre*
Apiaceae	*Eryngium tenue*
Apiaceae	*Oenanthe crocata*
Asparagaceae	*Scilla autumnalis*
Asteraceae	*Andryala integrifolia*
Asteraceae	*Calendula arvensis*
Asteraceae	*Carlina hispanica*
Asteraceae	*Carlina racemosa*
Asteraceae	*Cnicus benedictus*
Asteraceae	*Coleostephus myconis*
Asteraceae	*Crepis vesicaria subsp. taraxacifolia*
Asteraceae	*Leontodon taraxacoides subsp. longirostris*
Asteraceae	*Onopordum acanthium subsp. acanthium*
Asteraceae	*Senecio jacobaea*
Boraginaceae	*Echium plantagineum*
Brassicaceae	*Brassica barrelieri*
Brassicaceae	*Capsella bursa-pastoris*
Brassicaceae	*Teesdalia nudicaulis*
Campanulaceae	*Campanula lusitanica subsp. lusitanica*
Caryophyllaceae	*Herniaria scabrida subsp. scabrida*
Caryophyllaceae	*Petrorhagia nanteuilii*
Caryophyllaceae	*Spergula arvensis*
Caryophyllaceae	*Spergularia purpurea*
Cistaceae	*Helianthemum aegyptiacum*
Cistaceae	*Tuberaria guttata*
Convolvulaceae	*Convolvulus arvensis*
Crassulaceae	*Sedum andegavense*
Crassulaceae	*Sedum arenarium*
Dennstaedtiaceae	*Pteridium aquilinum subsp. aquilinum*
Euphorbiaceae	*Euphorbia helioscopia subsp. helioscopia*
Fabaceae	*Astragalus pelecinus subsp. pelecinus*
Fabaceae	*Coronilla repanda subsp. dura*
Fabaceae	*Hymenocarpos cornicina*
Fabaceae	*Hymenocarpos lotoides*
Fabaceae	*Lathyrus angulatus*
Fabaceae	*Lotus pedunculatus*
Fabaceae	*Medicago arabica*
Fabaceae	*Medicago polymorpha*
Fabaceae	*Ornithopus compressus*
Fabaceae	*Trifolium arvense var. arvense*
Fabaceae	*Trifolium dubium*
Fabaceae	*Trifolium cherleri*

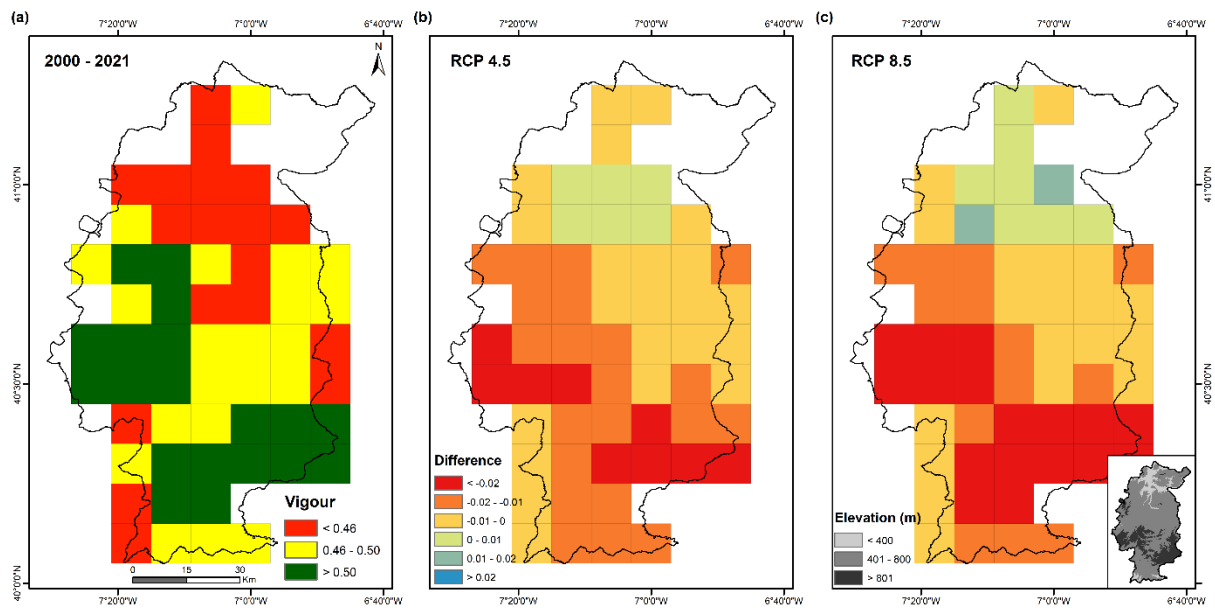| Family	Taxonomy
Fabaceae	*Trifolium repens var. repens*
Fabaceae	*Trifolium subterraneum*
Fabaceae	*Vicia disperma*
Geraniaceae	*Erodium botrys*
Hypericaceae	*Hypericum undulatum*
Juncaceae	*Juncus acutiflorus*
Juncaceae	*Juncus conglomeratus*
Juncaceae	*Juncus effusus*
Lamiaceae	*Lamium coutinhoi*
Lamiaceae	*Lamium purpureum*
Lamiaceae	*Marrubium vulgare*
Lamiaceae	*Mentha suaveolens*
Lamiaceae	*Salvia verbenaca*
Lamiaceae	*Stachys arvensis*
Malvaceae	*Malva tournefortiana*
Orobanchaceae	*Bartsia trixago*
Papaveraceae	*Papaver rhoeas subsp. rhoeas*
Plantaginaceae	*Anarrhinum bellidifolium*
Plantaginaceae	*Linaria spartea*
Plantaginaceae	*Plantago coronopus*
Poaceae	*Agrostis castellana*
Poaceae	*Bromus hordeaceus*
Poaceae	*Catapodium rigidum subsp. rigidum*
Poaceae	*Dactylis glomerata*
Poaceae	*Festuca ampla*
Poaceae	*Festuca arundinacea*
Poaceae	*Festuca rothmaleri*
Poaceae	*Lolium multiflorum*
Poaceae	*Lolium rigidum*
Poaceae	*Lolium perene*
Poaceae	*Poa bulbosa*
Poaceae	*Vulpia myuros*
Primulaceae	*Asterolinon linum-stellatum*
Ranunculaceae	*Ranunculus muricatus*
Resedaceae	*Sesamoides purpurascens*
Rubiaceae	*Crucianella angustifolia*
Scrophulariaceae	*Verbascum pulverulentum*

Figure S1. Grassland NDVI values in the Côa region for the recent-past (2000–2021) and differences for two anthropogenic radiative forcing scenarios for the long-term future period (2071–2100): present (2000-2021) (a), RCP 4.5 and (b) and RCP 8.5 (c), obtained from the mean of NDVI-values. The elevation is also represented.
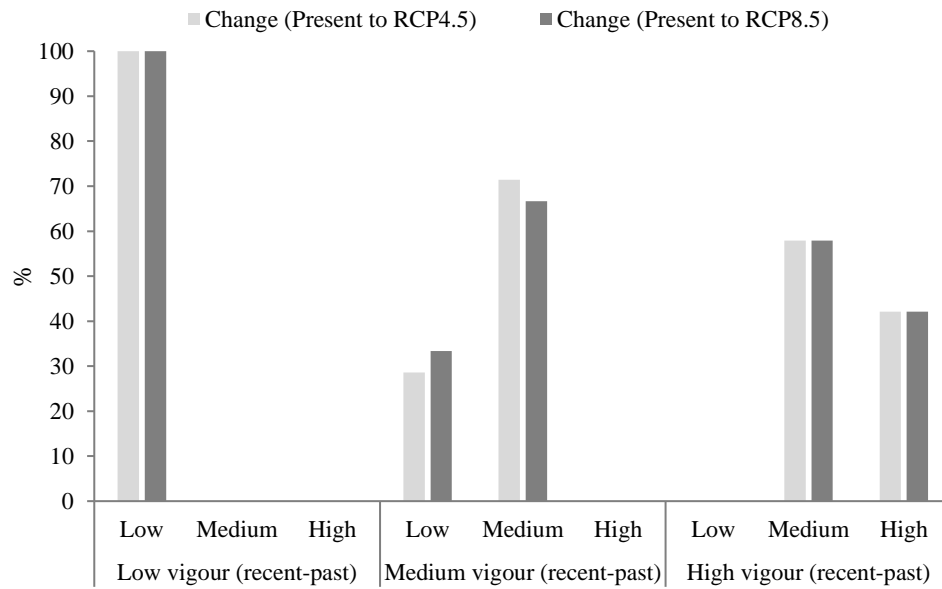
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Figure S2. Changes in grassland vigour class from the recent-past (2000-2021) to the future period (2071-2100) for RCP4.5 and RCP8.5. The values are percentage representations of the number of pixels that changed or remained in the same vigour class.
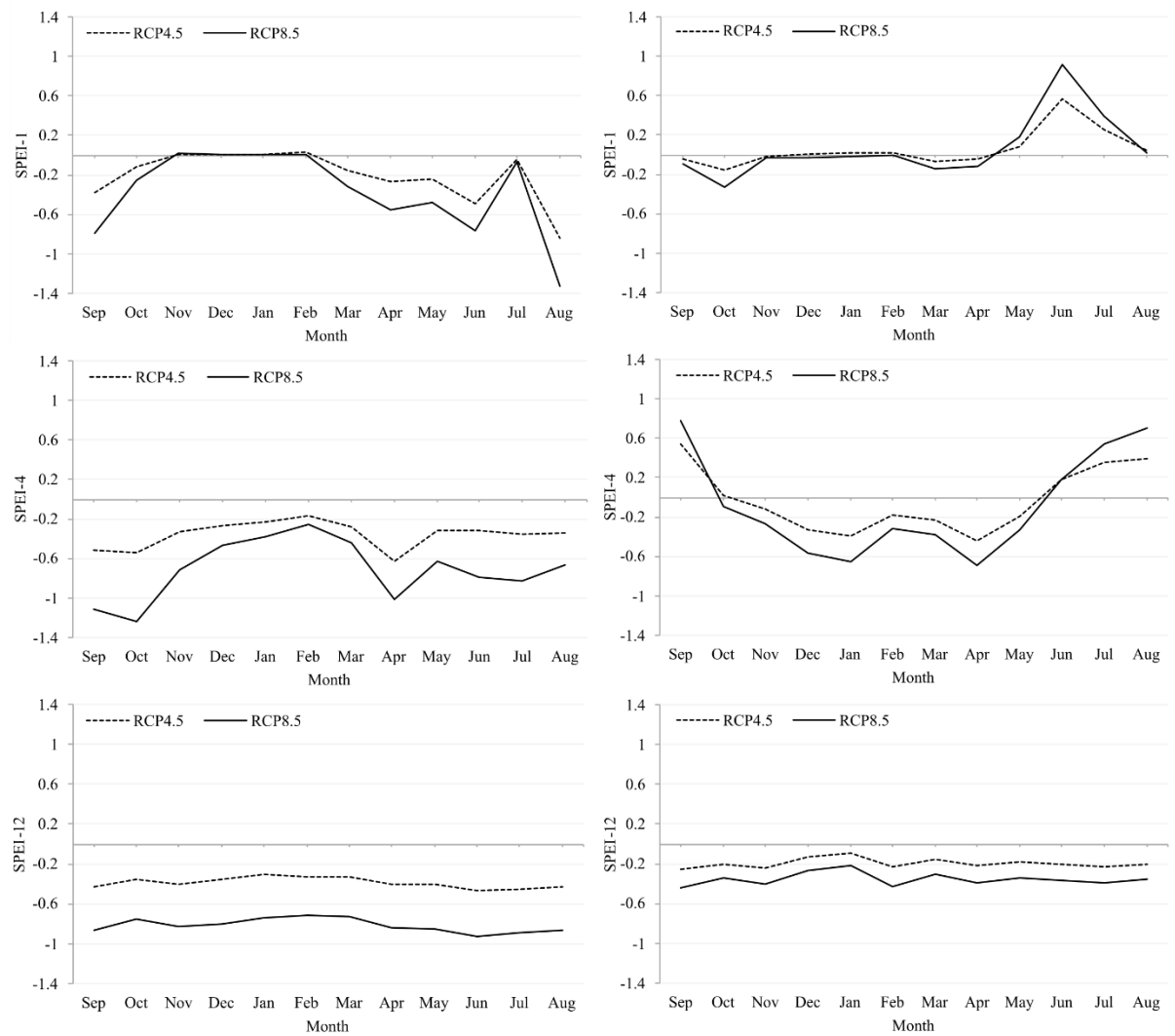
Figure S3. The graphs correspond to the sum of the future difference (RCP4.5 and RCP8.5, for the period 2071-2100) of the monthly values of SPEI-1, SPEI-4 and SPEI-12 relative to the current values (2000-2021). The representations were made from data obtained for two distinct regions. The left-side figures (40.1 S and -7.3 E) represent the generalized reduction of SPEI, and the right-side ones (41.2 S and -7.0 E) show a projected increase in specific months.
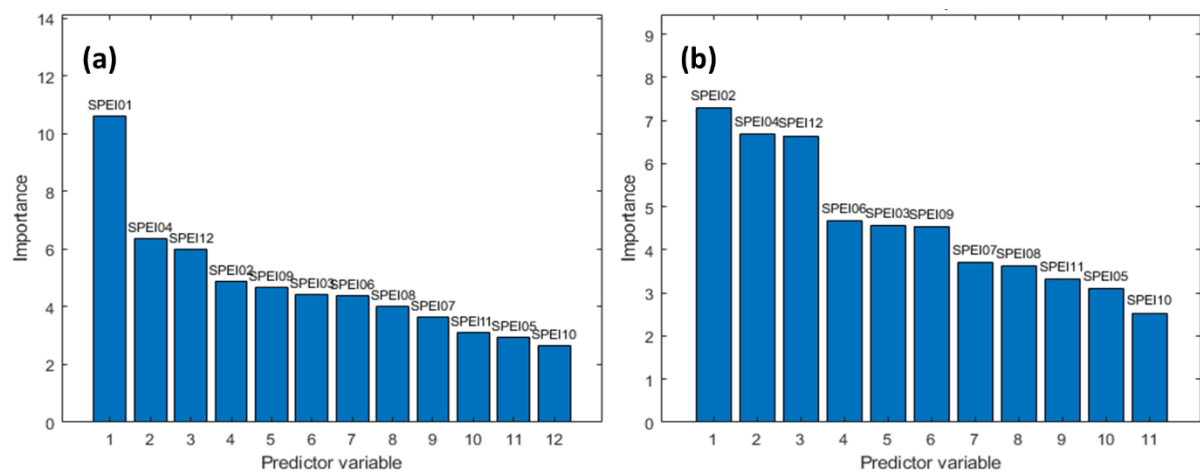
Figure S4. Estimates of feature importance, indicating of the more relevant predictors for the RF model: (a) with all SPEIs, (b) after removing SPEI-1.