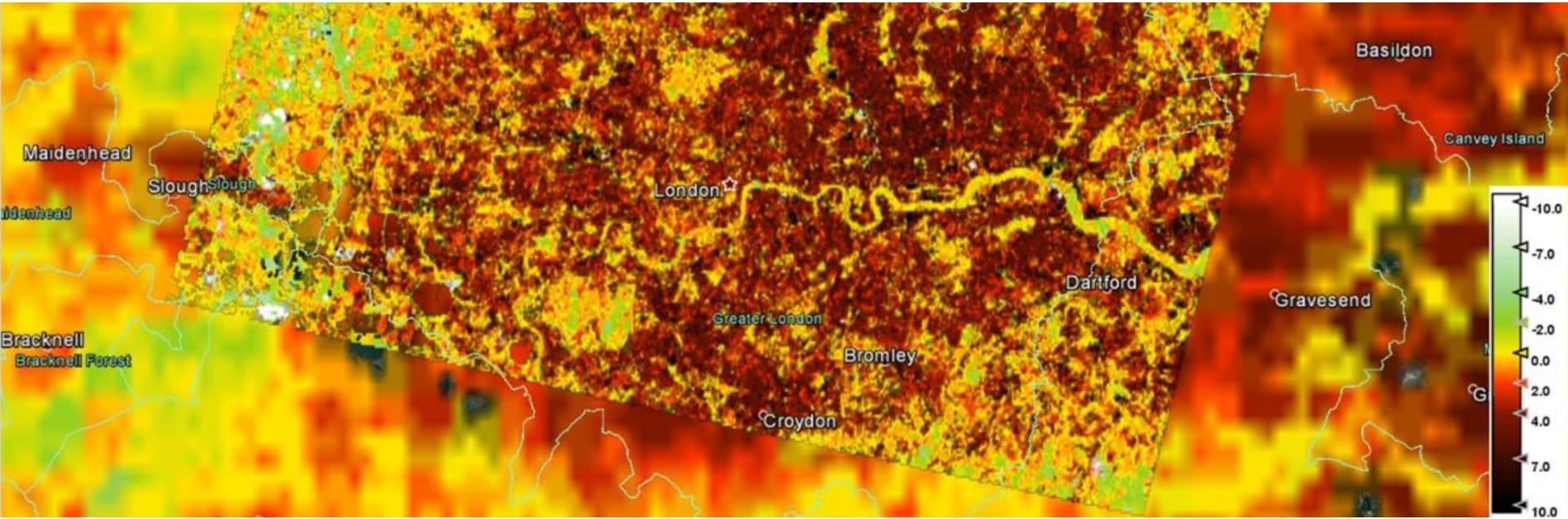
VEGETATION HEALTH INDEX

SPACE CLIMATE
Uniting UK space-enabled climate expertise and services

Enhanced Green Infrastructure Monitoring & Management under a Changing Climate



ABOUT US

Uniting UK space-enabled climate expertise and services

Who we are

Chaired by the UK Space Agency, Space4Climate spans government, industry and academia, uniting those with expertise in the development of satellites, analysis and exploitation of data they gather, and production of quality assured global data and climate services.

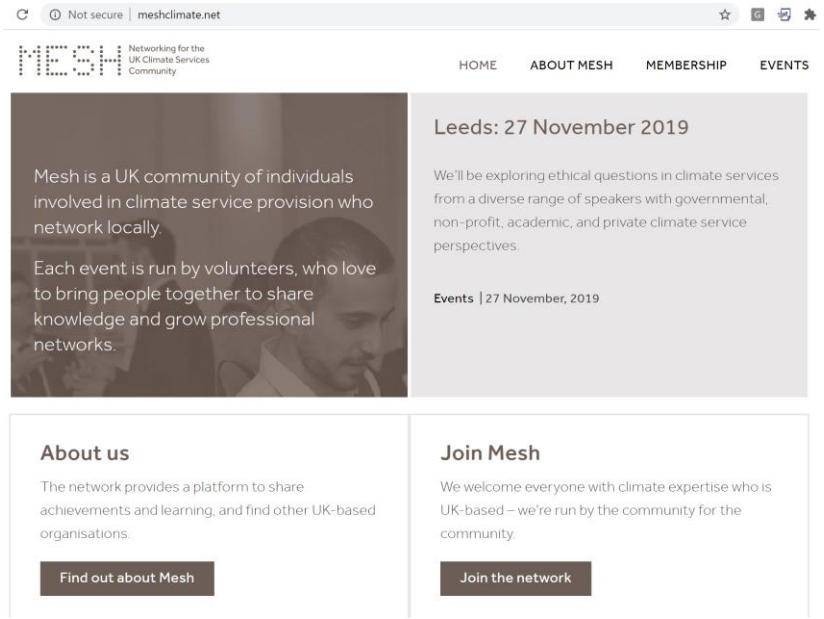
Trusted services

Our mission is to ensure a seamless supply of trusted climate intelligence from space so that the UK offers a thriving, supportive environment for the development of quality assured products and services enabling climate-smart decisions, disclosures and climate-sensitive planning.

What we do

We connect UK producers and global users of trusted Earth observation data and actionable space-enabled climate analytics and services. We respond rapidly to emerging needs and develop new opportunities and collaborations. Discover more about our membership activities.

NETWORKS WE HOST



Urban vegetation health and climate resilience Task Group

Index idea established by Space4Climate working with London Climate change Partnership as an outcome of the Heat data and vulnerability + Mapping and Monitoring GI in London using Satellite Data events.

Proposal developed by Associate Professor Alejandro Dussaillant, Middlesex University with support from scientists and industry experts in the Space4Climate group and the London Climate Change Partnership.

CONTEXT

Trees, open spaces including squares as well as pocket and larger parks, rain gardens, green roofs and green walls (Green Infrastructure, GI) can provide climate resilience services providing direct & indirect benefits including:

- Reducing heat related stress -during hot weather GI can provide ambient cooling of surroundings, community cool spots (through shading, solar radiation deflection and release of moisture into atmosphere)
- Reduction of surface water flood risk – during/preceding flooding, water attenuation and retention, slowing water flow, helping to reduce surface water flooding and its impacts
- Human health – directly (reducing impacts from excess heat and flooding and likelihood of occurrence) and indirectly providing places for social interaction, solitude, places of sensory delight and respite.

Vegetation starts to suffer from water stress before the root-soil moisture lowers to wilting point. Stomata in leaves start to close to protect the plant, reducing Evapo-Transpiration. This affects the energy budget of the plant and particularly foliage, increasing the surface temperature of the foliage surface. These effects can provide indicators that can be used to monitor plant water stress.

The proposed index will be designed to address user requirements of green space landowners, managers and portfolio holders. An open source version will be created, capable of functioning across the UK, with pilot testing with London land owners, such as public sports (golf, cricket) and leisure iconic venues e.g. Hyde Park, Olympic Park, Kew Gardens, Wimbledon, Lord's, Wembley. Technical scoping and supply chain mapping will be produced for add-on components that require commercial data and/or further scientific development. The index will make use of existing, mainly open Earth observation (EO) derived datasets, and the UKCP18 projections.

What the Space4Climate group are doing to support this –we've set up an urban vegetation health and climate resilience Task Group

Purpose

Foster use of EO data to monitor urban vegetation health, climate risks posed and support land managers in climate resilience and optimisation of GI ecosystem and urban climate services

Objective

Objective of the task group: Map existing and future capability to provide data, algorithms and tools to help monitor, assess and manage vegetation in urban and rural areas

Task 1 –scope and map current and emerging relevant climate EO capability for GI health and resilience

Task 2 development of a prototype vegetation health index.

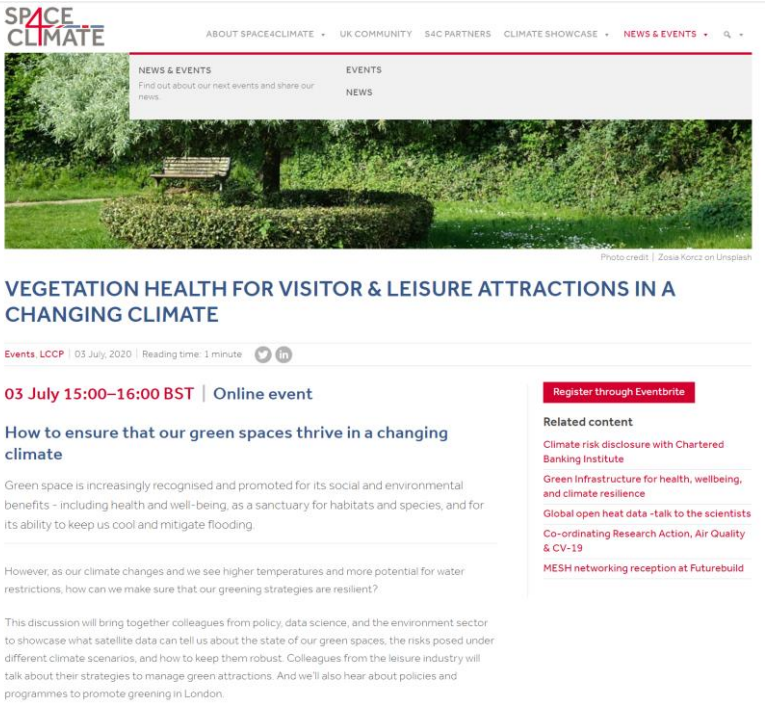
YOUR INVOLVEMENT

Do you manage land in London with vegetation? Perhaps you are a sports facility, a heritage visitor attraction, management company of public or private spaces. Could you see potential benefit from having access to this type of index?

In the early stages of this project prospective beneficiaries will be by consulted, surveys issued, to understand what operational activities this index could help to inform, what bespoke requirements there are and what operating systems would be used to either draw from this index or need to have the index outputs embedded into if have in-house platforms. There might also be existing products that would require compatibility and, or, could be evolved through integration.

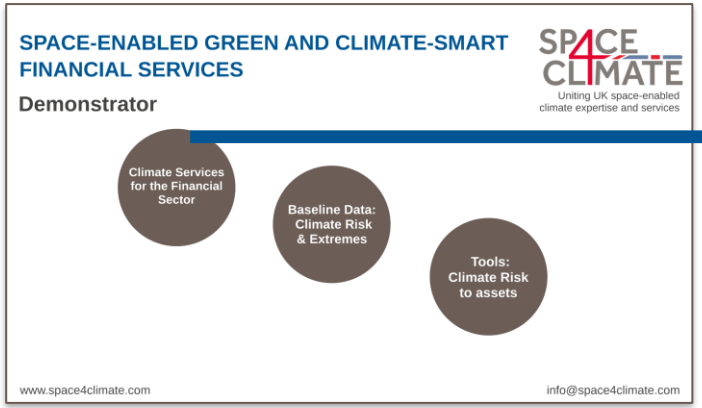
During development of this prototype, there will also be scoping of additional functionality including:
(i) Location of SUDS for optimal GI ecosystem services, considering reducing risks of subsurface contaminant mobilisation and whether GI can provide a service to reduce indoor exposure to hazardous ground gasses from ex-landfill sites
(ii) Upscale to UK for those with national portfolios and globally for those with international portfolios

JOIN US FOR A MORE TECHNICAL DISCUSSION



FIND OUT MORE ABOUT SPACE-ENABLED CLIMATE SERVICES

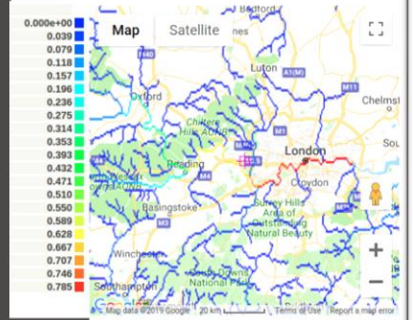
Click here to explore climate satellite data and tools:



Green Investment in Flooding Nature Based Solutions

Eco:Actuary combines global climate data, a flooding catastrophe model, socio-economic data and a global assets database. Allows green infrastructure investors to:

- Examine impacts of Natural Flood Management strategies in reducing risk and loss to assets downstream
- Examine impact of climate change adaptation strategies on losses, using multi-GCM climate change scenarios at various RCPs alongside increased extremes
- Examine downstream influence of specific interventions on risk and loss



Eco:Actuary modelled scenario of tree planting in UK protected areas showing change in accumulated maximum total flood storage capacity for rivers (Km3/yr).

The change is greatest for the River Thames, which being a catchment with many protected areas and little tree cover reaches an increase of 0.81 Km3/yr.

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