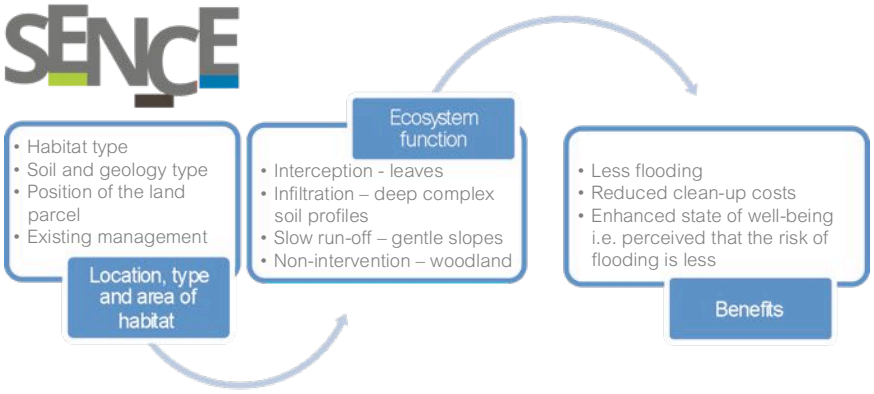
Natural Resource Management approach to Flood Risk

Context

The increasing frequency and intensity of storm and flood events, is compromising our ability to identify and determine areas of land in our urban centres, which are suitable for ongoing development.

Environment Systems was commissioned by Pembrokeshire County Council to assess the current ecosystem service regulating capacity across the county. The work is the first step towards developing catchment-based measures to help reduce flooding in towns in Pembrokeshire.



Principle of Ecosystem service supply for flood risk - How different elements of an ecosystem function together increasing the retention time water and reducing overland flow

What we did

Environment Systems used the SENCE (Spatial Evidence for Natural Capital Evaluation) tool to model the existing ability of the land across Pembrokeshire to prevent flooding.

We analysed dataset attributes for habitat type (including habitat condition), soils, geology, management practice and steepness of slope. Informed by existing scientific knowledge each attribute was entered into a rule base where they were scored in a range from high to low significance. The rule base was then joined with GIS data and the SENCE tool used to create an Ecosystem Service stock map for flooding. A soil erosion model identified areas at greater risk of flooding. Using these in combination and further binary analysis a series of opportunities were identified.

After creating the stock map a soil erosion model was calculated to identify areas at greater risk of increasing flooding. Using the combination of the Ecosystem Service Stock Map and Soil Erosion Risk Map a series of opportunities were identified using binary analysis.

Results

The resulting Opportunity Map shows locations where undertaking natural flood management measures would be preferential. These include planting wet woodland and shelter belts across slopes, the promotion of mob-grazing, contour ploughing and ‘swale’ creation. Some of these measures will be developed and tested on site.

By establishing a robust workflow comprising remote sensing software, accurate rule sets and enhanced ecological knowledge, the maps can be easily updated. Satellite imagery can be processed more quickly and cost effectively to monitor the region over time, either by using new imagery as it becomes available, or by processing past imagery to create a historical record of habitat change.

Context

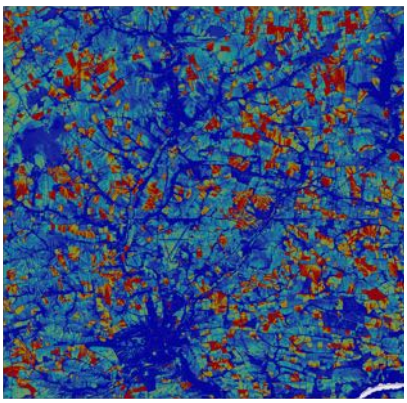
- Assessment of natural defences against flooding
- Better identification of urban development opportunities
- Sustainable development

Outcomes

- Creation of a stock map for ecosystem service regulating capacity
- Areas identified for natural flood prevention measures

Benefits

- Greater understanding of functioning ecosystems
- Focus on natural measures for flood prevention
- Maps that can be easily updated in the future



Pembrokeshire erosion map

Natural flood management opportunities map

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