

## MAPPING TO IMPROVE WATER RESILIENCE

### Background

HWH engages with fruit growers to support water management best practice for improved business and environmental resilience.

Depending on grower needs, resilience can be improved by scoping for alternative sources of water such as rainwater harvesting and storage or developing and delivering Nature based Solutions [NbS] such as floral plots, wetlands and tree planting to reduce runoff impacts from muddy flooding and soil erosion.

Thus, a suitable raft of site specific measures can bring a grower multiple benefits, from greater “irrigation autonomy” to mitigation measures that can also improve water and soil quality and boost biodiversity.

A Courtauld Commitment 2030 project, HWH measures also benefit others in the catchment, from farmers and landowners to water companies and water dependent enterprises.

### The importance of an evidence base

To address the subject of resilience around holistic water management it is important to:

- Develop tools that can identify and measure how resilience changes across the catchment.
- Use accurate mapping to identify polytunnel based horticulture businesses situated in areas of higher and lower resilience.
- Use this information to engage with growers through site visits, talk about the challenges they face and draw up solutions in Farm Plans.

### Developing a mapping methodology

The South East Rivers Trust [SERT] has developed a remote sensing based methodology to map polytunnels. Accurate mapping supports an evidence-based approach when talking with growers about how holistic measures can improve water resilience and bring about other benefits.

HWH mapping methodology criteria:

- Rapid and low cost; open access resources used wherever possible.
- High levels of accuracy.
- Capacity to cover large geographical areas – from catchments to regions.
- Accessible and easy to understand: to encourage uptake and roll out across other sourcing catchments.

The three stages of the HWH mapping methodology developed by SERT are summarised on the next page.

### In a nutshell

SERT has used open access satellite images to map and then ground truth polytunnels in the Medway. This allows SERT to focus engagement with growers and stakeholders to talk about HWH measures to improve water resilience.

This targeted approach supports the development of Farm Plans that strategically measures to improve catchment health and business longevity.

Remote sensing means work is carried out “from a distance”.

This term describes the use of images taken from satellites or aircraft to detect or monitor physical characteristics on the ground.

## Source and work on images

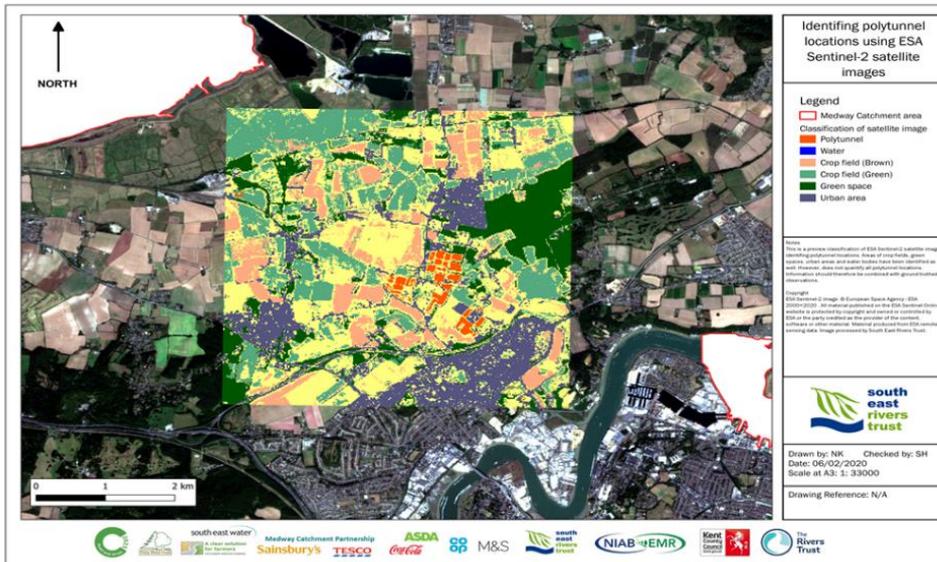
- EU Copernicus portal Sentinel 2 open access images
- land use, soil, water cover and coastal areas
- Apply image selection criteria
  - No cloud cover
  - Low pixellation levels
- Identify relevant spectral signatures
  - Polytunnels, crop fields, green spaces, urban areas and water
  - Create gradients for each signature

## Create maps with GIS tools

- Crop images to catchment boundary
- Create GIS layers
  - QGIS ROI tool applied to selected spectral signatures to create a raster layer
  - Convert raster to vector layer to create polygons and attribute tables
- Overlay with SCIMAP
  - identify resilience hotspots

## Refine and improve mapping

- Problem
  - similar spectral signatures found for urban areas, solar farms and polytunnels
- Solution
  - go back, refine the input for identifying spectral signatures and gradients and reapply



## Output

Initial output produces a map of different types of land use across the Medway. The orange polygons are polytunnels.

Since developing this methodology SERT has ground truthed almost 70% of Medway polytunnels. That means we know the name of the farm and the grower. The maps also provide approximate information on polytmunnel area.

When combined with information from SCIMAP and SCALGO, we can identify areas at risk and target efforts to engage

with growers to discuss ways to improve water resilience.

## Next steps

- Complete ground truthing of the Medway polytmunnel map [name of farm and name of grower];
- Assess sector interest in rolling out the methodology to other sourcing catchments;
- Combine output with information on catchment resilience [SCIMAP, SCALGO etc.] to target grower engagement.