

Environment Agency Using drones to help us create a Better Place

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National Monitoring, Operations: Regulation, Monitoring & Customer

Drone Pathfinder Programme: Environment and Agriculture workshop

24th July 2019

Who we are


Department
for Environment
Food & Rural Affairs

 Environment
Agency



Creating a better place
Our ambition to 2020

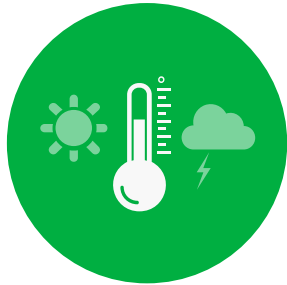
April 2016



 Environment
Agency

What we do

We protect and improve the environment



We help people and wildlife adapt to climate change and reduce its impacts.



We improve the quality of our water, land and air by tackling pollution.



We work as part of the Defra group to create a better place for people and wildlife.

Environment Agency activities using drones

- Regulating Industry - *Water Resources, Waste Management*

Fisheries

- Environmental monitoring – *Habitat changes*
- Inspection - *Maintaining river & sea defences*
- 3 Dimensional survey – *waste volume analysis*
- Communication – *Engaging with the public & stakeholders on all EA work*

Thames Barrier Drone flight



EA Drone capabilities:



- Operating 4 rotary drones, in-house, with 5 PfCO operators (currently).
- *Fisheries*
- Contractors used for regular and specialist work.
- Operating a 24/7 Incident service with TeamUAV
- Working with partners, commercial and FRS/Police
- Varied multiple use, as part of the EO capability: - Boats, Drones, Planes, HAPS, Satellites

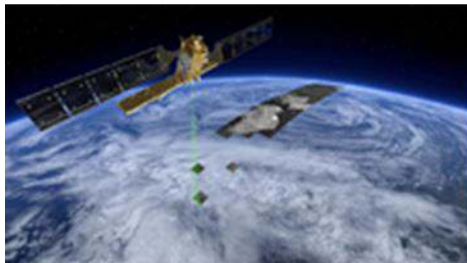
Right Data, Right Time: Instrument(s) & Platform

Satellite – SAR, Optical, Thermal, Gas

Aircraft - LIDAR, RGB/NIR, Multi-spectral

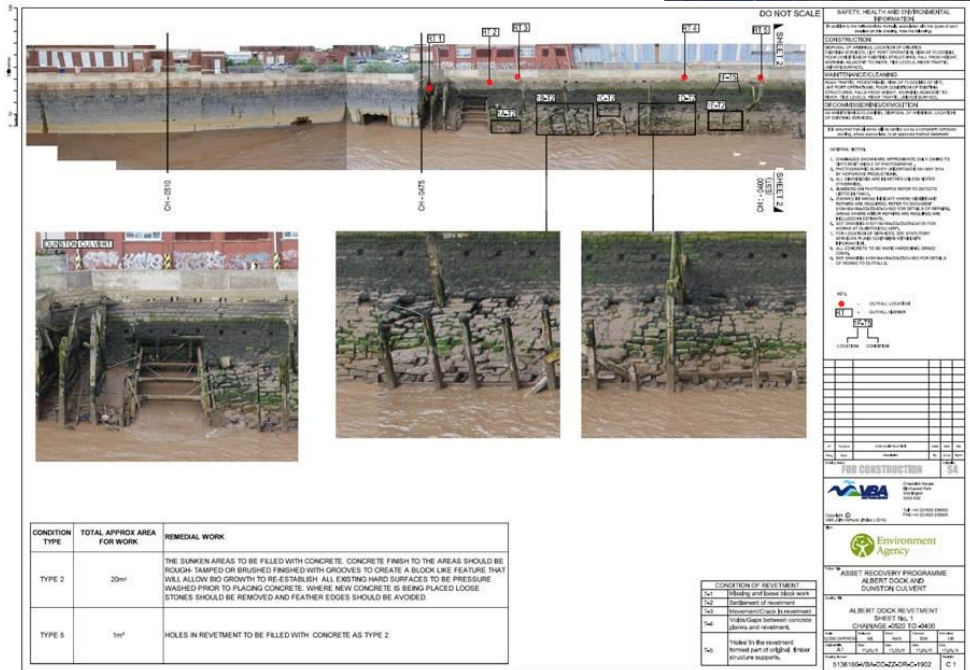
Drone – RGB/NIR, Thermal, Video

Ground – GPS/Photo.



Operations: Asset Inspection

Structure inspection:
 Low cost compared to scaffold
 Low risk, no working at height
 Used widely e.g. Facilities Inspections to Weirs



Operations: Survey & Inspection

Asset Inspections, Survey (incl. LIDAR), Comms



Follow

We're assessing riverbank erosion using drone technology today along the River Trent #Croxall after recent rainfall / high water levels



RETWEETS 9 LIKES 4



4:15 am - 26 Nov 2016



PLAN: It is hoped restoration work last winter on a Weardale hillside will help reduce flooding further down the dale



Coastal defence construction



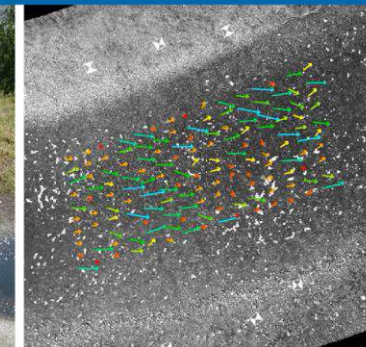
Operations: example Trials

- Landfill monitoring & Waste sites, Field survey support
- R&D



Evaluating the use of video imagery from Unmanned Aerial Vehicles (UAVs) and fixed sensors for river flow monitoring.

Sophie Pearce (PhD Student) University of Worcester.



Waste site fire - stockpile volumes

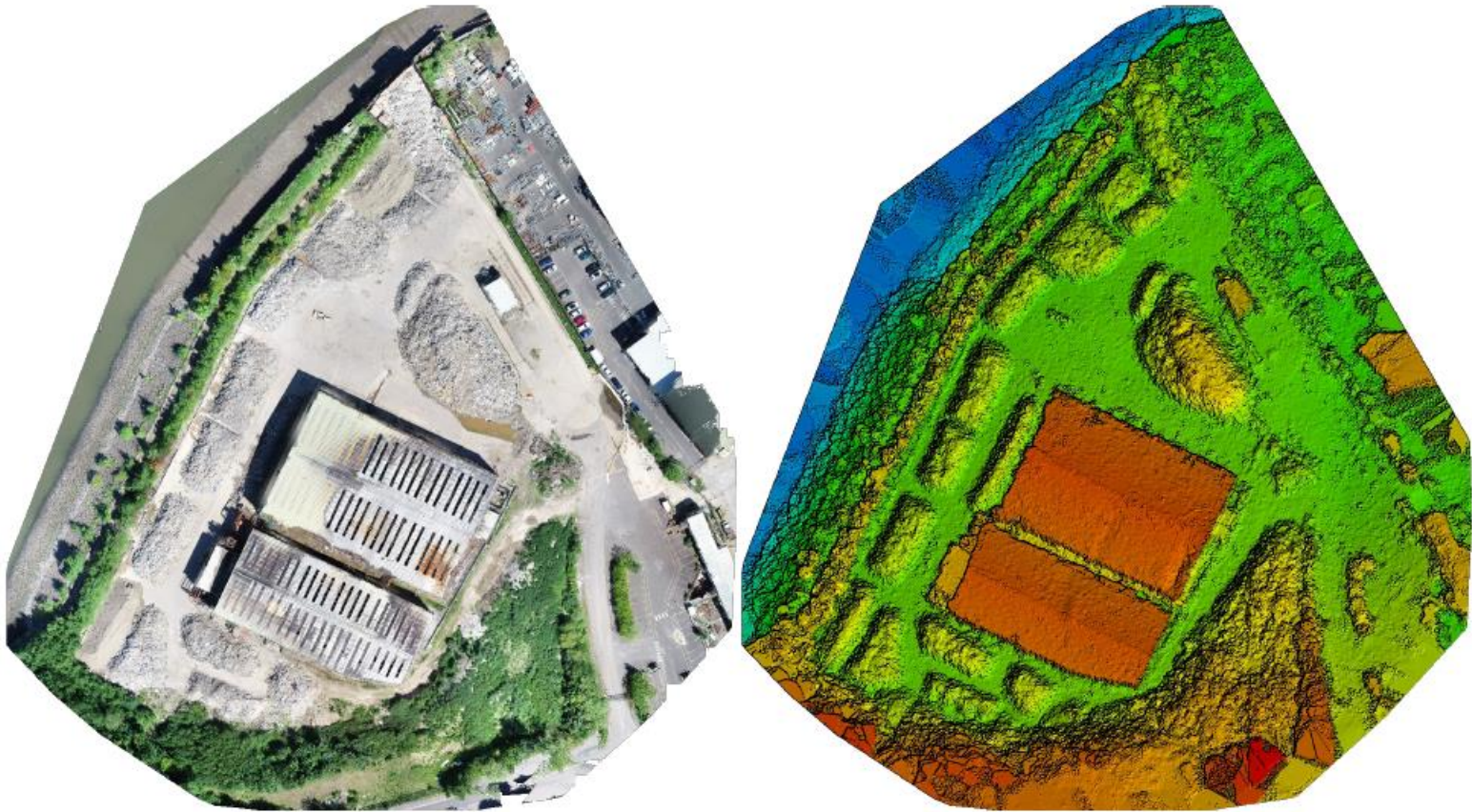
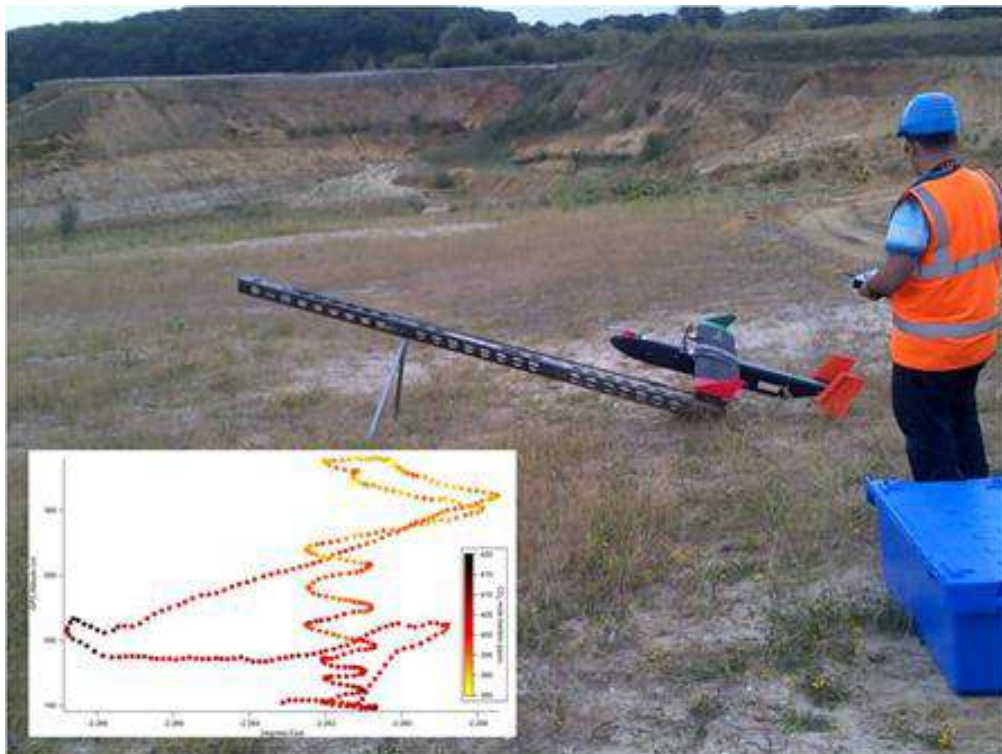


Figure 1: Orthomosaic and the corresponding sparse Digital Surface Model (DSM) before densification.

R&D Landfill Methane

Objective is to develop and validate a robust method to quantify whole site methane emissions from landfills using measurements from a small unmanned aircraft system. (Manchester university).

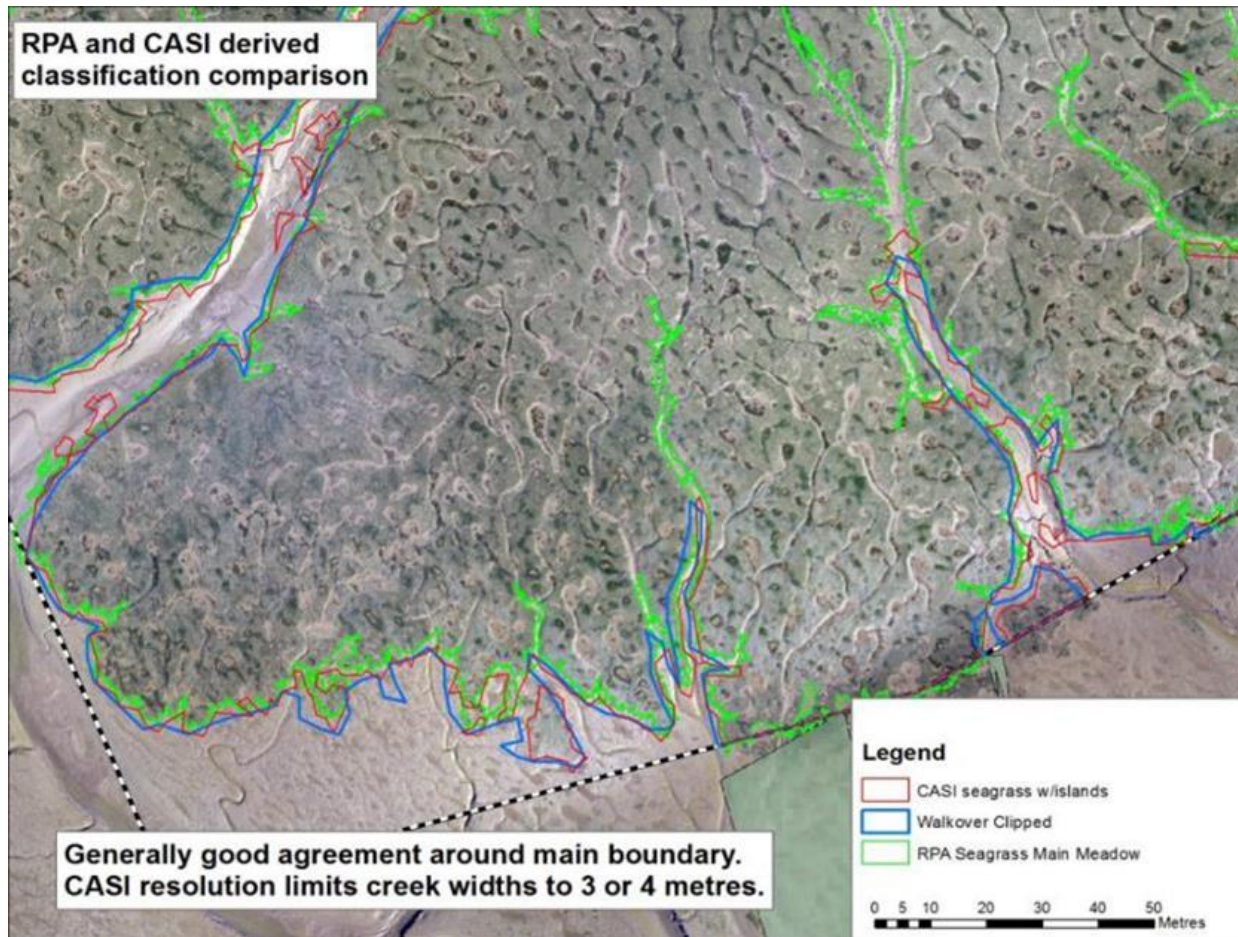
Industry cost effective alternative.



R&D Seagrass habitat mapping

WFD tools for Seagrass and Macro Algae mapping

Working with CEFAS in the Thames estuary and a second survey at Budle bay, Holy Island NE coast using EVLOS.

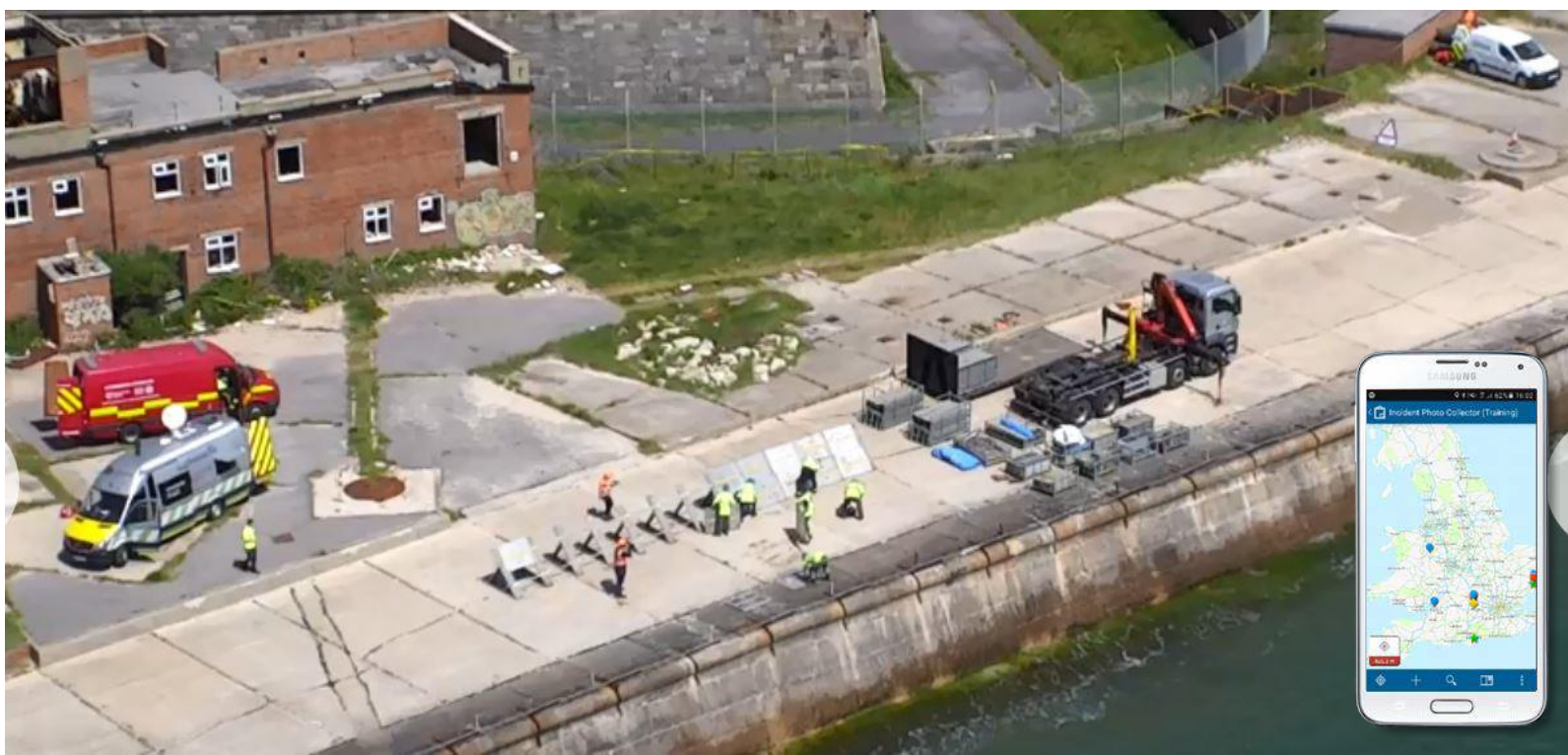


Species / density
Cost and People.
Instruments:
Satellite / CASI / UAV

EA Incident Response



- 24/7 6 hour response service operating since Oct 2017 deploying 2 dedicated quadcopter drones
- Fisheries*
- Live streaming and stills to Incident Rooms.
 - Flooding and Environmental pollution incidents.
 - TeamUAV contractor provide a tiered service. Equipment includes 30x optical zoom and Thermal plus camera on a 15m fixed mast.
 - Working alongside partner Cat 1 responders, e.g. Fire & Rescue Service and Police.



Area In Detail

UAV No: 0455

UAV Commander: Adam Tate

Area In General

UAV No: 1470

UAV Commander: Lewis Pritchard

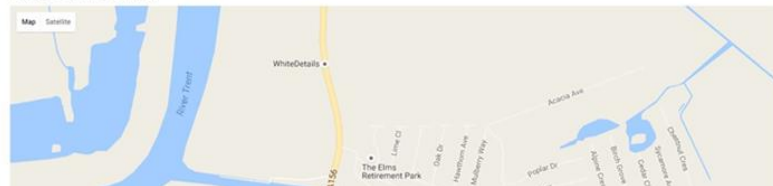
Fixed Mast View

UAV No: None

UAV Commander: None



Take Off Location



Chat with Team UAV

Chris Kenneth
Support Agent

Hi Phil, we have around 2 minutes until we have to bring the area in general uav down and change battery. Just changing area in detail battery now. should be back up soon.

Hi Phil, rain is heavier so the guys have had to bring the UAV's down temporarily. Hi Phil, here is a geotagged photo from the Area In General UAV

IMG_0272.JPG



Environment Agency

Future Use

- Beyond VLOS?
- Air Quality Sensors?
- Difficult Environments
 - Such as Culverts
 - Inspections



Thank you and Questions

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