esri UK

Case study

Monitoring environmental change in the UK

UK Centre for Ecology & Hydrology

The Challenge

- Improve the speed and quality of environmental research

The Benefits

- 50% time savings in report generation
- Data ready for analysis 7 days faster
- £700,000 cost savings on one survey alone
- Improved management of nationwide projects
- A high level of accuracy and data integrity

The UK Centre for Ecology and Hydrology (UKCEH) has completely transformed the way that it conducts field-based environmental research. Surveyors use a suite of ArcGIS data capture apps to collect high quality data more quickly, speeding up the delivery of reports, reducing survey costs and building up a clear picture of environmental change.

The Challenge

An independent, not-for-profit research institute, the UK Centre for Ecology & Hydrology (UKCEH) is the UK's centre of excellence for research in land and freshwater environmental sciences. It conducts independent research aimed at improving understanding of the natural environment and the impact that human activity has upon it.

For decades, environmental survey methods had largely remained unchanged. The Countryside Survey, for example, was first undertaken in the 1970s and, by the early 2000s, it still involved writing information on paper in the field and typing it up in the office afterwards. UKCEH wanted to completely modernise its approach to collecting environmental data in the field. It therefore set about creating a fully integrated, digital workflow for undertaking The Countryside Survey and other long-term monitoring projects more cost and time efficiently.

The Solution

UKCEH worked with geographic information system (GIS) specialists from Esri UK to develop a field-based, digital data capture approach, using mobile solutions from Esri's ArcGIS system. First launched in 2007, this transformational new digital workflow enabled surveyors to collect environmental data in the field, on laptops and tablets, for the first time.

Since then, Esri UK has helped UKCEH to migrate to the latest ArcGIS Online apps and update its ArcGIS-driven survey method, making this digital process even better adapted to the challenges of collecting and sharing environmental data. Today, botanists use an ArcGIS Survey123 app to collect and accurately geo-reference soil samples and record around 1,200 plant species. Ecologists view environmental data in the field on ArcGIS Field Maps, while other surveyors use a mobile app configured with Sweet for ArcGIS to record changes to trees and landscapes.

Data collected in the field using ArcGIS is transferred digitally from mobile devices directly into ArcGIS Online without manual intervention or the re-entering of data. When field operations are completed, environmental experts from UKCEH use ArcGIS to help them analyse the data and present the results clearly in reports. An ArcGIS Online Dashboard gives the project team a clear overview of research projects, enabling them to closely monitor the progress of surveyors often working hundreds of miles apart.

UKCEH has used its ArcGIS-driven survey approach for successive Countryside Surveys, covering England, Scotland, Wales and Northern Ireland, as well as the Welsh Government's Environment and Rural Affairs Monitoring and Modelling Programme (ERAMMP) and the Bunce Woodland Survey. The configuration of its ArcGIS apps and dashboards can be easily replicated for other UKCEH surveys in the future, saving time and minimising new project costs.

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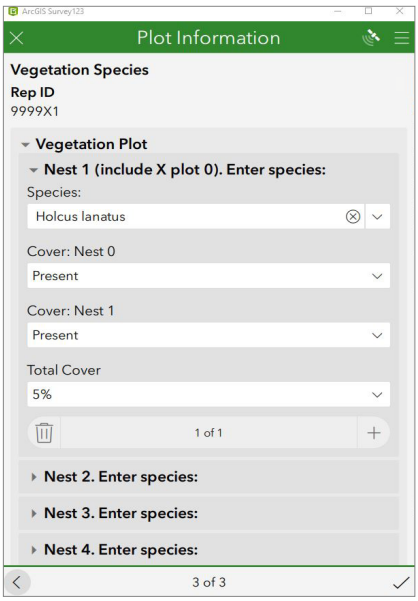
Case study

> “Whether they are collecting soil samples, monitoring the presence of pollinators, recording plant species or editing woodland features, our surveyors use ArcGIS apps to collect accurate data, in a standard way, and work efficiently in the field.”

Claire Wood, Senior Geospatial Information Scientist, UKCEH



An ArcGIS Survey123 app for collecting vegetation data in the field

The Benefits

50% time savings in report generation

The use of ArcGIS has enabled UKCEH to dramatically reduce the time required to undertake environmental surveys. Indeed, the first time that ArcGIS was used for The Countryside Survey, UKCEH was able to produce the report in just one year, in less than half the time of the previous survey. “The value of ArcGIS comes not only from the mobile data collection capabilities, but from the powerful back-end process,” says Peter Henrys, UKCEH Statistician. “ArcGIS gives us a clear digital workflow for our survey data from the field right through to the publication of reports.”

Data ready for analysis 7 days faster

In the ERAMMP project in Wales, UKCEH estimates that the use of ArcGIS mobile solutions enables it to make data and imagery from the field available for analysis seven days sooner, giving it faster insight into emerging environmental trends. “All the data we need is in the database straight away, so we save at least a week of time per site, compared to the previous survey that was completed seven years ago,” explains Claire Wood, Senior Geospatial Information Scientist at UKCEH.

£700,000 cost savings on one survey alone

UKCEH no longer has to pay for collected data to be digitised, and this reduces costs significantly. Indeed, when the first ArcGIS-driven digital data capture process was introduced in 2007, the organisation calculated that it saved over £700,000 on one Countryside Survey alone. The cost of developing the original ArcGIS mobile solution was less than half of the cost of paying digitisers for twelve months. Since UKCEH migrated to ArcGIS Online solutions it has further reduced costs, as it no longer needs to make software updates.

Improved management of nationwide projects

The use of ArcGIS Dashboards enables UKCEH to monitor surveyors’ progress when they are working in the field. This real-time oversight helps it to manage large-scale, nationwide environmental research projects and deliver the evidence needed to inform national environmental policies on schedule. “We can make sure that progress is as it should be and pick up on any issues straight away,” Wood explains.

A high level of accuracy and data integrity

An added benefit of the ArcGIS approach is that it helps surveyors to collect data in a very consistent way. This leads to a high level of data integrity and accuracy in UKCEH environmental research. As Wood observes, “Whether they are collecting soil samples, monitoring the presence of pollinators, recording plant species or editing woodland features, our surveyors use ArcGIS apps to collect accurate data, in a standard way, and work efficiently in the field.”

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