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Revealing ancient history with modern technology

AOC Archaeology

The Challenge

- Improve the efficiency of commercial archaeology projects

The Benefits

- 25% cost savings from improved efficiency
- Deeper understanding of the past
- Professional data sharing with clients
- Greater public interest in local heritage

While AOC Archaeology is concerned with revealing and recording archaeology about people who lived thousands of years ago, its use of technology is right up-to-date. The company is using solutions from Esri's ArcGIS platform in the field, on desktops and online to deliver efficient, cost-effective and professional services for clients.

The Challenge

Demand for commercial archaeology services is rising sharply. Communities are successfully raising funds to explore their local heritage, while developers are increasingly required to provide archaeology reports as a precursor to gaining planning permissions. In addition, there are over forty large, multi-million pound infrastructure projects planned in the UK over the next five years, almost all of which will need to take archaeology into account.

To meet the increasing demand for its services, AOC Archaeology recognised that it needed to update its traditional methods of surveying sites, collecting and analysing data and sharing information. In particular, the company needed to transform its field-based processes, so that archaeologists would no longer have to take physical maps to sites, in all weather conditions and difficult terrains, and then type up their notes manually when they got back to the office. "Using paper-based systems alone is not viable anymore," says Laura O'Connor, Geomatics and GIS Manager for AOC Archaeology. "We needed better systems to help us respond to the growth in demand for commercial archaeology services, by delivering highly professional services for clients more quickly and cost effectively."

The Solution

To thoroughly modernise its processes and eliminate the need to use paper in the field, AOC Archaeology deployed a suite of solutions from Esri's ArcGIS platform.

Now, AOC Archaeology's consultants use Esri's Collector App for ArcGIS to record information about their site observations and archaeological finds, on mobile devices, during pre-development site walkovers. In tandem, the company's geophysical survey team uses Survey123 for ArcGIS to collect and share information about land access permissions, vegetation, crop growth and other issues that might impact archaeology projects. Both apps work effectively online and offline, allowing them to be used in remote locations including the Scottish Orkney islands.
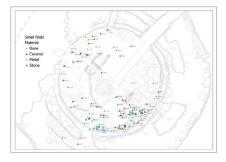
All the data collected in the field using the ArcGIS mobile apps is uploaded automatically to Esri's cloud solution, ArcGIS Online, where it is instantly visible to team members in AOC Archaeology's four national offices. ArcGIS Online also provides a flexible platform for sharing information about heritage sites, in an interactive format, with AOC Archaeology's clients, local interest groups and the general public.

In addition, AOC Archaeology's consultants and geophysical survey team members use either ArcMap or ArcGIS Pro on desktops to combine the data collected in the field with historical mapping, third party environmental data, local authority records and high quality LIDAR imagery. Both teams perform sophisticated geospatial analyses to help them build up a more detailed understanding of sites. They can then provide well-informed recommendations to clients and share their analysis with clients using ArcGIS Online.

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> "By improving efficiency, ArcGIS is helping AOC Archaeology to achieve cost savings of around 25% - and on big projects this can be many thousands of pounds. "

Laura O'Connor, Geomatics and GIS Manager, AOC Archaeology

Small finds
Material
▪ Bone
▪ Ceramic
▪ Metal
▪ Stone

Using ArcGIS to analyse the locations of ancient artefacts excavated at Clachtoll Broch in Scotland

The Benefits

25% cost savings from improved efficiency

The use of ArcGIS mobile apps has generated significant cost savings for AOC Archaeology, by improving the efficiency of its data capture processes. Archaeologists spend less time at sites, don't need to type up notes when they get back into the office and have easy access to all the information they need to produce reports more quickly. "By improving efficiency, ArcGIS is helping AOC Archaeology to achieve cost savings of around 25% - and on big projects this can be many thousands of pounds," O'Connor says.

Deeper understanding of the past

AOC Archaeology has begun to use ArcGIS to perform more location-based analysis and derive greater insight from its data. For example, at Clachtoll Broch, an Iron Age structure in Scotland, the company has captured the exact locations of over 500 archaeological finds and is analysing this data with ArcGIS Pro. By evaluating where different types of artefacts were located, in different areas of the Iron Age dwelling, it has gained a deeper understanding of how people lived. "Just because we study the past, doesn't mean to say we are live in the past when it comes to recording the nation's heritage," O'Connor says. "Our use of state-of-the-art GIS technology is enhancing people's understanding of Scotland's history."

Highly professional commercial services

The extended use of ArcGIS has put better data into the hands of consultants, enabling them to produce detailed pre-planning reports incorporating map images and make well-informed recommendations about how best to consider archaeology in new developments. AOC Archaeology also uses ArcGIS Online to share information directly with clients as part of its professional services. For example, the company used ArcGIS Online to improve collaboration with an international engineering firm as part of a pre-development project relating to a major rail infrastructure project.

Greater public interest in local heritage

In response to growing public interest in local history, AOC Archaeology is using ArcGIS Online in initiatives to help people to connect and engage with their heritage. In Scotland, the company has recently published an interactive web app for the Inverness Townscape Heritage Project that displays information and historic photographs about the history and development of a key street in the town. The web app includes a time slider tool, comparing historic maps and modern satellite imagery, which really captures the extent of the townscape's development in recent times, thereby enhancing people's knowledge of the area.

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