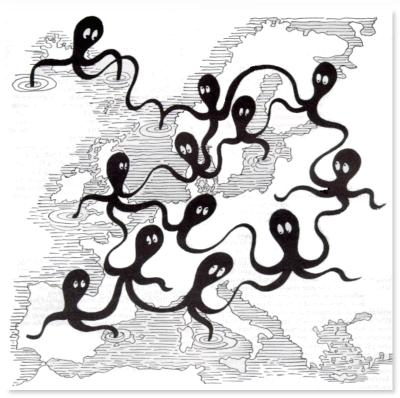


# Joined Up Thinking: The challenges of large scale data integration

Julian Richards, Director ADS; ARIADNE Deputy Coordinator



# Some prehistory....

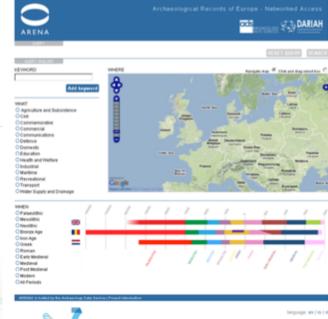


CAA 92, Aarhus: Henrik Jarl Hansen "European archaeological databases: problems and prospects".





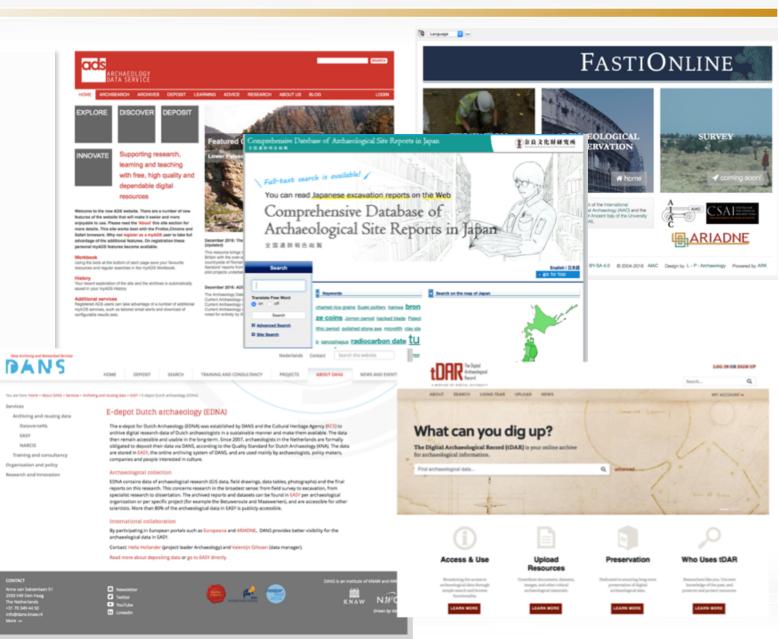
ARENA project, Culture 2000: Internet Archaeology 18, 2005 Based on Z39.50 protocol and qualified Dublin Core ARENA2
(DARIAH) 2009
Migrated to
RESTful
technologies

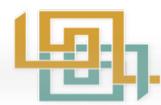




# Challenges

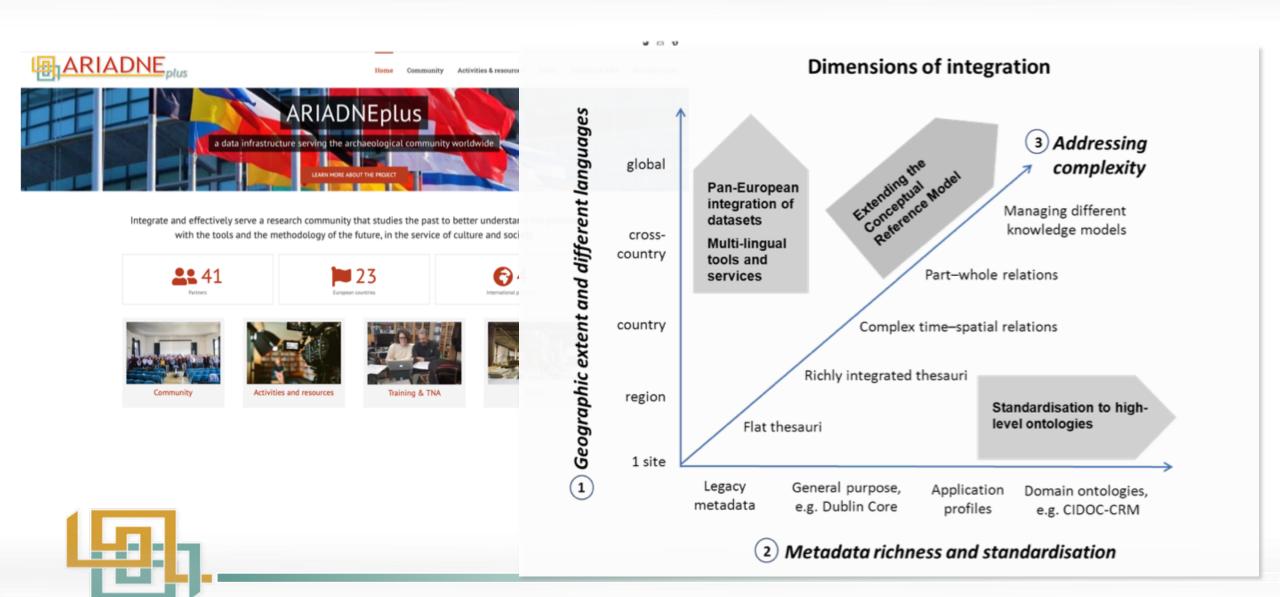
- Data Integration
  - Multiple datasets
  - Multiple repositories
  - Haves and have-nots
  - Cross border searching
  - Interoperability







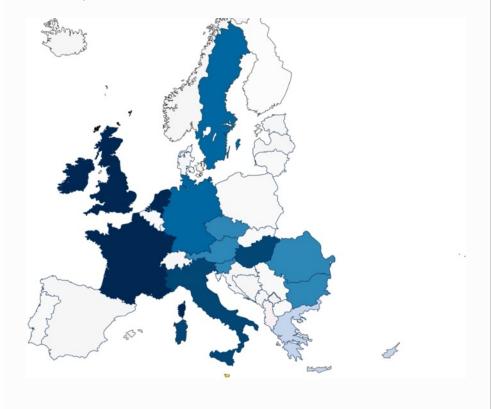
## The ARIADNE roadmap



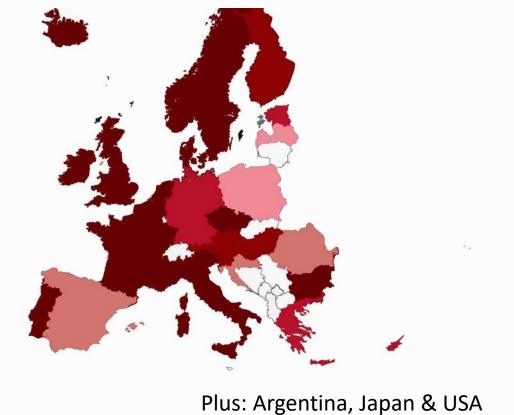


# Extending geographically

- ARIADNE: 2012-2016
- 24 partners; 18 countries

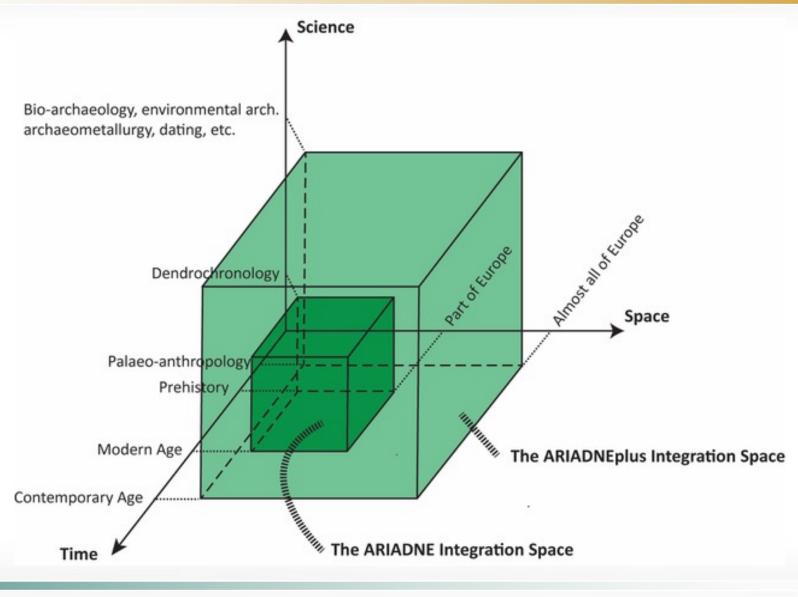


- ARIADNEplus: 2018-2022
- 41 partners; 27 countries





# Extending thematically

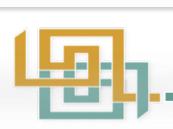






### The aims of ARIADNE

- Capacity and community building in the sector cf SEADDA
- Enabling cross-border / crossinstitution resource discovery i.e. finding data
- Enabling interoperability across partners, countries, data types, data schemas i.e. enabling research









### How do we measure success?

### Quantity

- Number of records in the ARIADNE Catalogue / triplestore
- Number of countries represented

### Quality

- Good *meaningful* search results
- Level of *granularity* item level interoperability e.g. individual artefacts, not just sites; individual dates; individual graves, not just cemeteries
- Integration of new data types
- Quantity and quality of re-use i.e. new users; new research



# How have we gone about it?

### Human interface – ARIADNE portal

- ARIADNE Catalogue (AC)
  - Harvested collection level metadata, but also item level data
  - Links to distributed digital and paper resources
- What, When, Where searches
  - Enhanced map-based searching
- Enhanced queries, specific to data types use of VREs

### Machine interface – via APIs

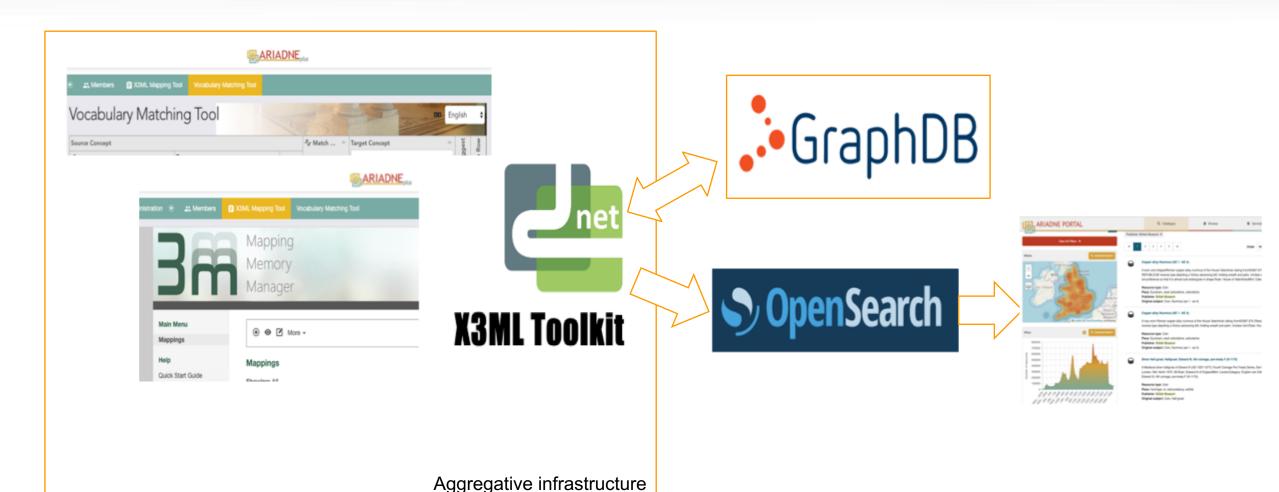
- Mirrors what is available via the catalogue
- Makes it available as Linked Open Data
- Allows other organisations to implement their own portal or services based upon the ARIADNE AC



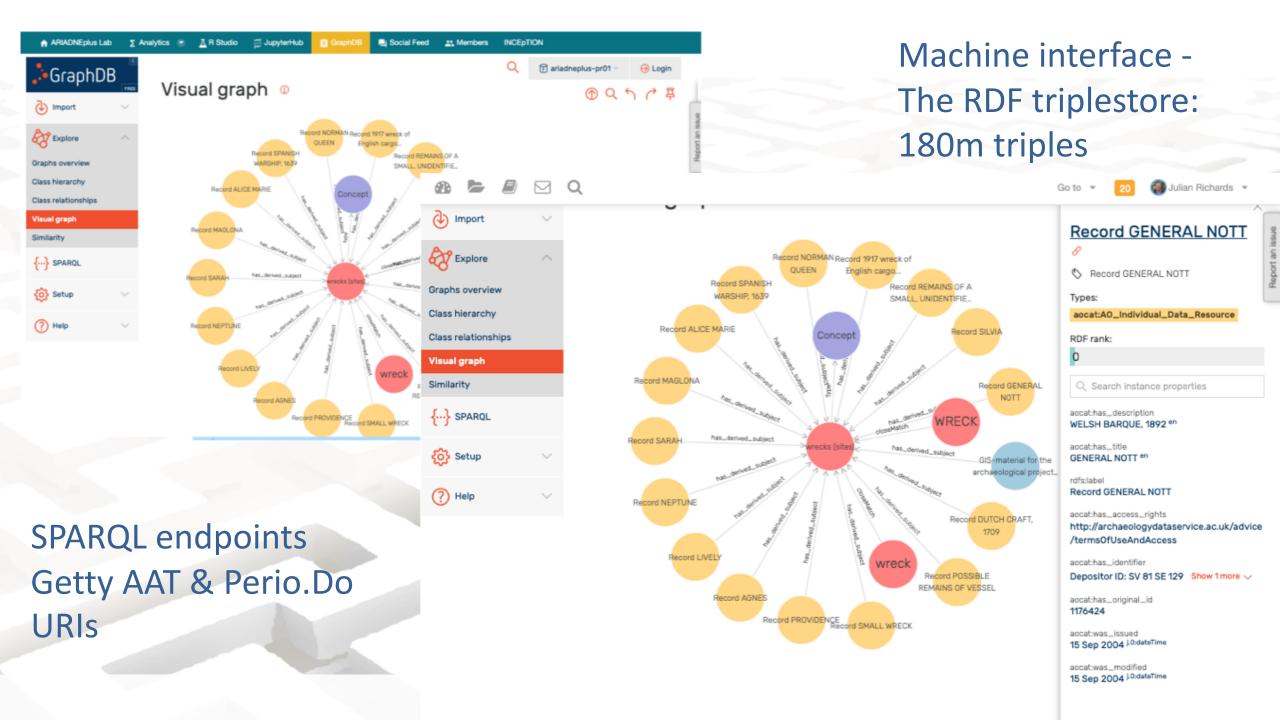
- User needs study which searches do we wish to support?
- Data availability "low hanging fruit" critical mass of item level data e.g. reports, sites, finds > "ARIADNE Resource types"
- Ontologies CIDOC-CRM to help provide an Object-Orientated data structure – shows how data types are related
- Data mappings
  - What? Getty AAT
  - When? Period0
  - Where? WGS84
- Application profiles subsets of the CIDOC-CRM we use for item level integration – working groups

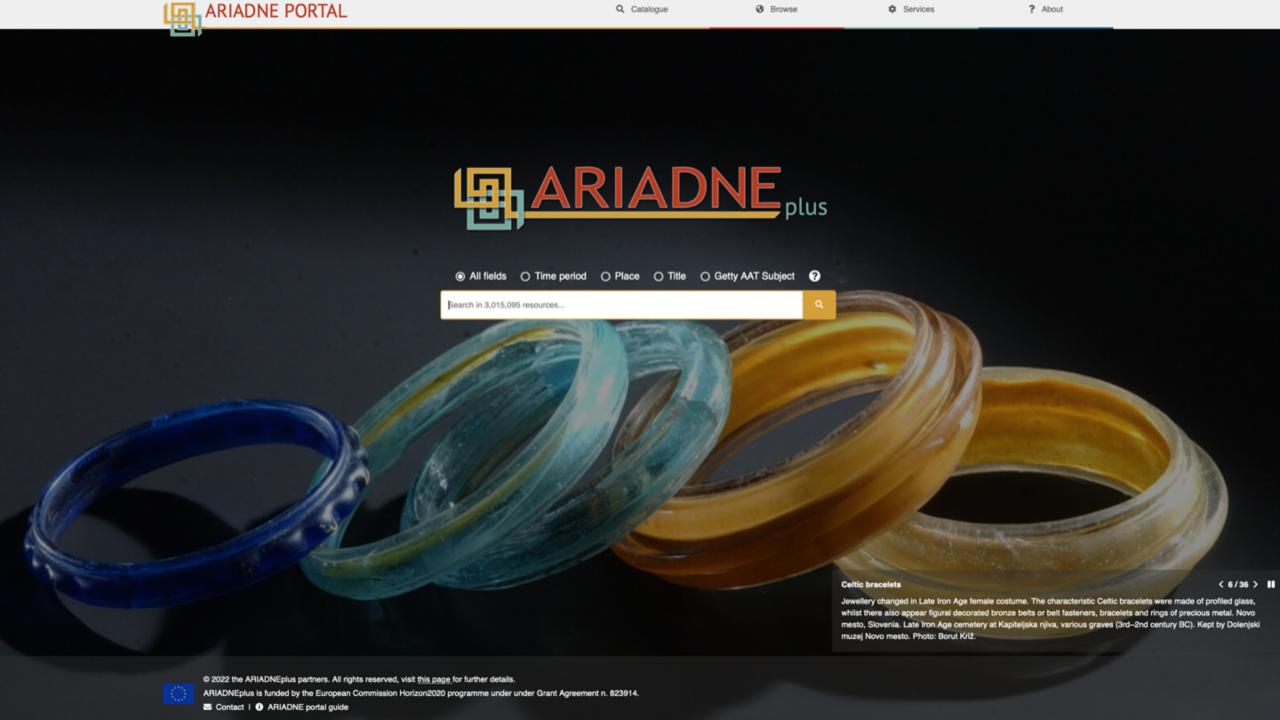


## Aggregation infrastructure

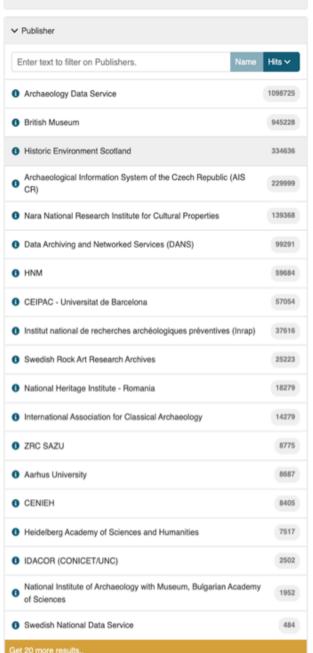








#### > Getty AAT Subjects





#### National Zooarchaeological Reference Resource (NZRR)



As part of Historic England (HE)'s Improving Sector Reference Resources project (project 7306), the aim of the Building a National Zooarchaeological Reference Resource (NZRR) project (project 7444) is to improve accessibility to zooarchaeological reference collections and facilitate zooarchaeological research across all sectors. Led by David Orton and Eva Fairnell at the University of York, a work..

Resource type: Scientific analysis

Place: World, europe, united kingdom, scotland, World, europe, united kingdom, wales, World, europe, united kingdom, england

Publisher: Archaeology Data Service

Original subject: Antler, Bone, Tooth, Animal bone, Ecofacts



#### Wearmouth and Jarrow: Northumbrian Monasteries in an Historic Landscape



In 2009 Newcastle and Durham Universities initiated a project aimed at exploring the landscape setting of the early Christian monastic sites of Wearmouth and Jarrow, from their foundation some seven centuries after the birth of Christ, to their place in contemporary society. Bringing together a large team of professionals with funding from English Heritage, the project established new evidence for..

Resource type: Fieldwork archive

Place: World, europe, united kingdom, england, tyne and wear, south tyneside, jarrow, World, europe, united kingdom, england, tyne and wear, sunderland, monkwearmouth

Publisher: Archaeology Data Service

Original subject: Optically stimulated luminescence, Building elevation survey, Core sampling, Geophysical survey, Geophysical magnetometer



#### Northamptonshire Historic Landscape Character Assessment



The Northamptonshire Historic Landscape Character Assessment provides a detailed review and description of the historic character of the Northamptonshire Landscape. The Northamptonshire HLCA seeks to analyse the general surviving historic character of the County and group areas of broadly similar character into Character Types, and then to sub-divide these into geographically distinct Character Ar..

Resource type: Fieldwork archive

Place: World, europe, united kingdom, england, northamptonshire

Publisher: Archaeology Data Service

Original subject: Historic landscape characterisation



#### Land adjacent to A5, Lutterworth, Leicestershire: Archaeological evaluation (OASIS ID: headland3-366701)



An archaeological evaluation was undertaken by Headland Archaeology, on Land to the east of the A5, Lutterworth, Leicestershire. The evaluation identified agricultural use of the land in the form of extensive post-medieval ridge and furrow field system remains, undated field boundary and drainage ditches and a former hedge-line field boundary. Alluvial deposits and the course of a paleochannel wer..

Resource type: Fieldwork archive

Place: World, europe, united kingdom, england, leicestershire, lutterworth

Publisher: Archaeology Data Service

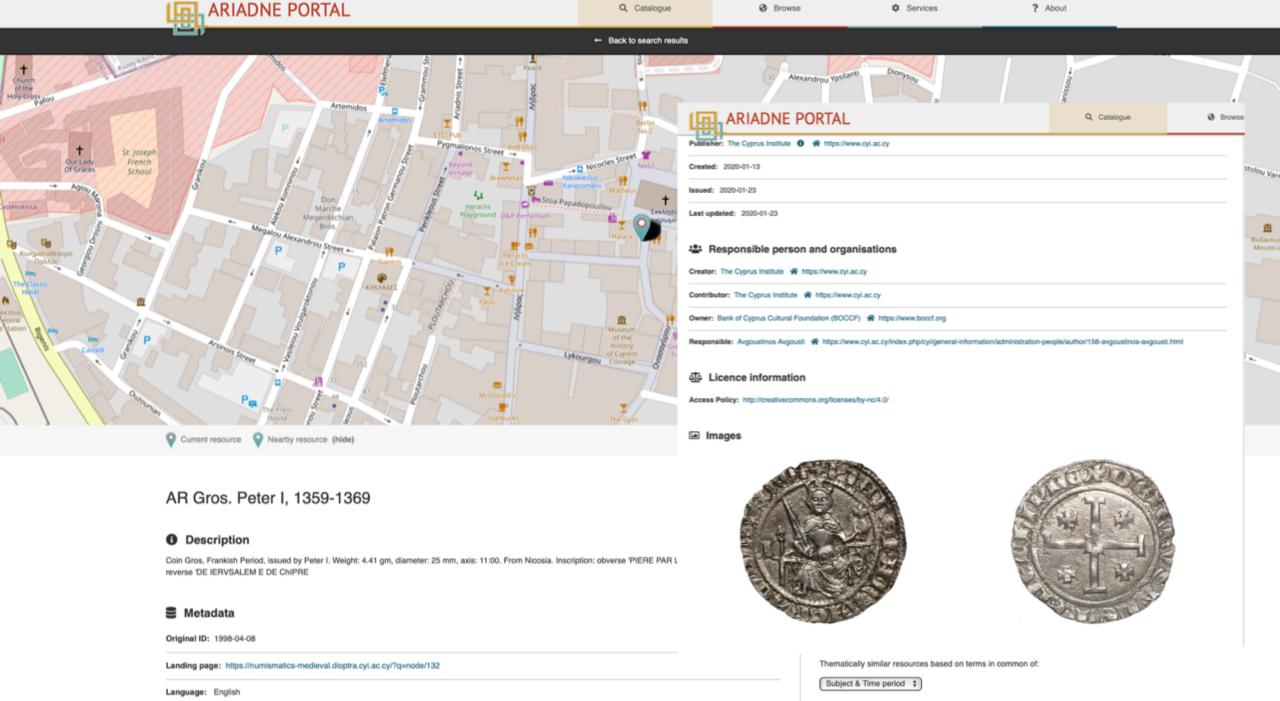
Original subject: Evaluation, Sample trenches, Ridge and furrow, Rural commercial



#### Land adjacent to Glebe Farm, Coventry Road, Lutterworth: Archaeological monitoring of boreholes (OASIS ID: headland3-369514)

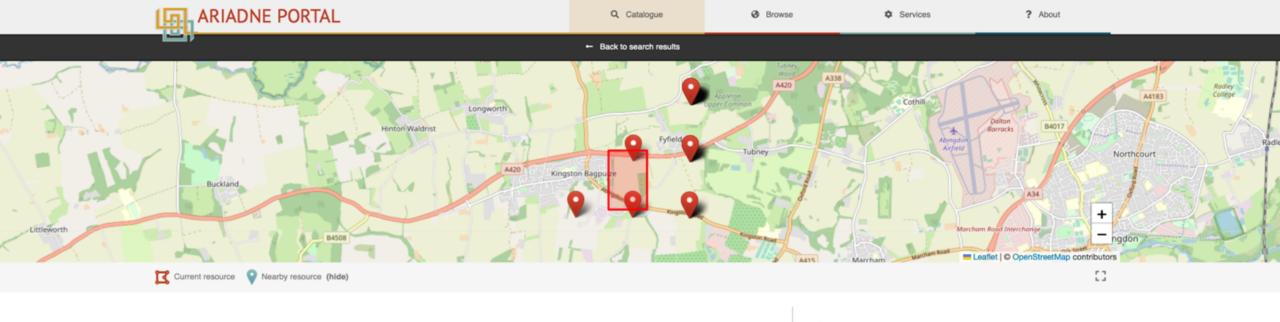


Archaeological borehole monitoring was undertaken by Headland Archaeology on land adjacent to Glebe Farm, Coventry Road, Lutterworth. Evidence suggesting an earlier route for the watercourse slightly to the south of its current position to the west of the boreholing area were produced along with the suggestion that intermittent and conjoining water sources contributed to deposit a sequence of allu..



Pacource type: Coin

AR Gros. Hugh IV, 1324-1359



### Site and Post-Excavation data from an evaluation at Abingdon Road, Kingston Bagpuize 2017



#### Description

This collection comprises reports, site records, site photographs, vector drawings, and finds catalogues from an evaluation carried out in September and October of 2017 prior to a proposed new residential development.

#### Metadata

Original ID: 1003980

Landing page: https://doi.org/10.5284/1084990

Language: English

Resource type:

Fieldwork archive

Fieldwork report

Subject - AAT: @

burial mounds (en)

pots (containers) (en)

Subject - Original:

Environmental sampling

Evaluation

Photographic survey

Sample trenches

#### Ø Resource links

View resource at provider

∆ Json ♦ Xml < Rdf Ø Cite ☑ Report an issue

#### Resource is part of

ADS Archives

#### Thematically similar

Thematically similar resources based on terms in common of:

Subject & Time period \$

County Durham and Darlington Historic Landscape Characterisation (HLC)

Archaeological mitigation on land at Rockingham Forest Park, Wansford Road, King's Cliffe, Northamptonshire (OASIS ID: molanort1-361720)

Towns in Transition in the First Millennium AD: York as a Case Study

Purbeck Pane

Thornhill Farm, Fairford, Gloucestershire

The Marsh of time: the saving of Sutton Common

▼ Worcestershire Historic Landscape Characterisation (HLC)



ADS Main Website Back to Archives Search | Help

# Site and Post-Excavation data from an evaluation at Abingdon Road, Kingston Bagpuize 2017

Oxford Archaeology (South), 2021. https://doi.org/10.5284/1084990. How to cite using this DOI

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#### Introduction

This collection comprises reports, site records, site photographs, vector drawings, and finds catalogues from an evaluation carried out in September and October of 2017 prior to a proposed new residential development.

In October 2017 Oxford Archaeology (OA) undertook an archaeological trial trench evaluation of the site of a proposed new residential development within three fields on land to the north of Abingdon Road, on the eastern side of Kingston Bagpuize, Oxfordshire (NGR SU 413 981). The work was commissioned by the Environmental Dimension Partnership Ltd (EDP) on behalf of Lioncourt Strategic Land.



Archaeological Evaluation at Abingdon Road: View of animal burial in Trench 12, Pit 1203 looking North

A barrow previously identified by geophysical survey was confirmed in the central field and an additional ditch identified by the evaluation may represent an outer ring ditch or an associated enclosure, potentially of Bronze Age date. A small number of early prehistoric struck flints, mostly in later features may represent knapping activity in this landscape.



ADS Main Website Back to Archives Search | Help

# Site and Post-Excavation data from an evaluation at Abingdon Road, Kingston Bagpuize 2017

Oxford Archaeology (South), 2021. https://doi.org/10.5284/1084990. How to cite using this DOI

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**Downloads** 

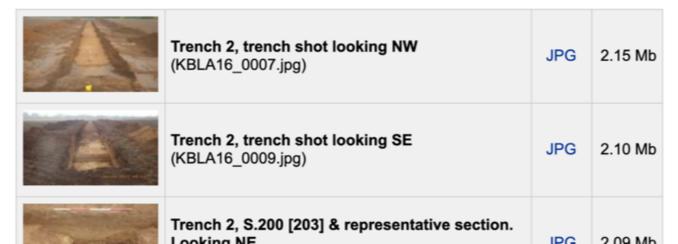
Reports | Images | CAD (Vector graphics) | Spreadsheets | Site Records

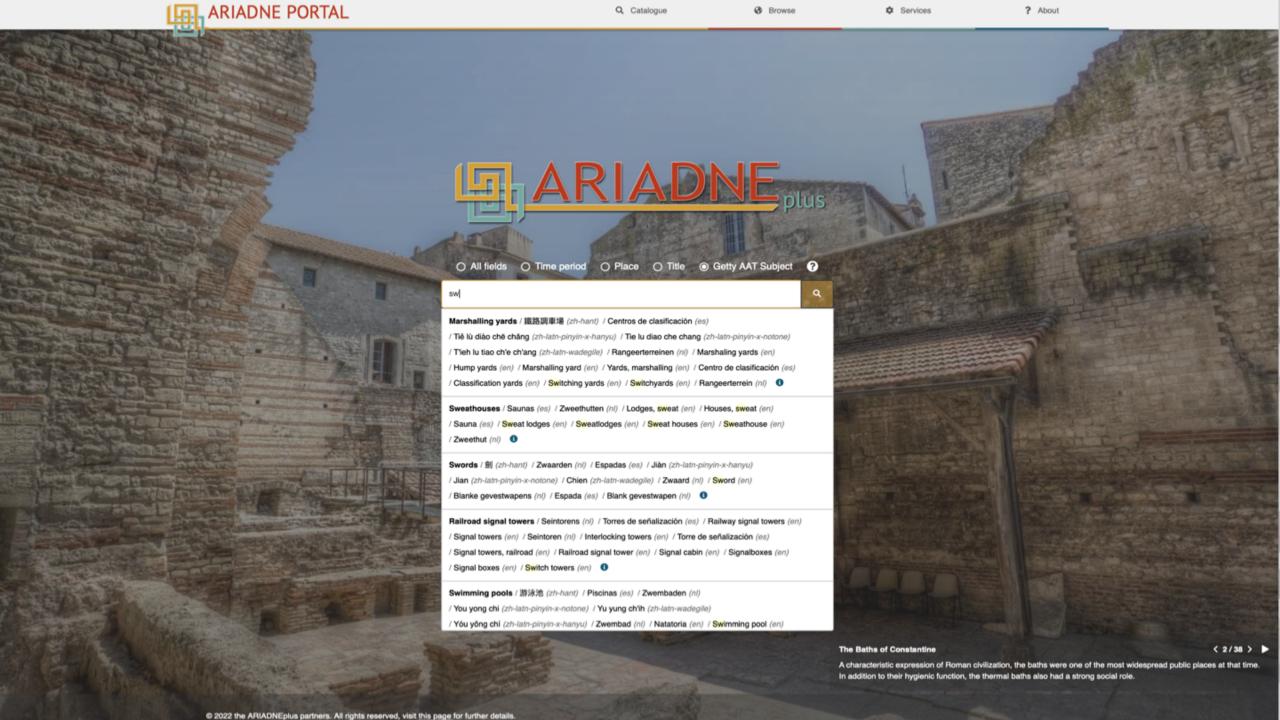
**Images** 

Image metadata CSV 50 Kb

Records 1 - 50 of 168

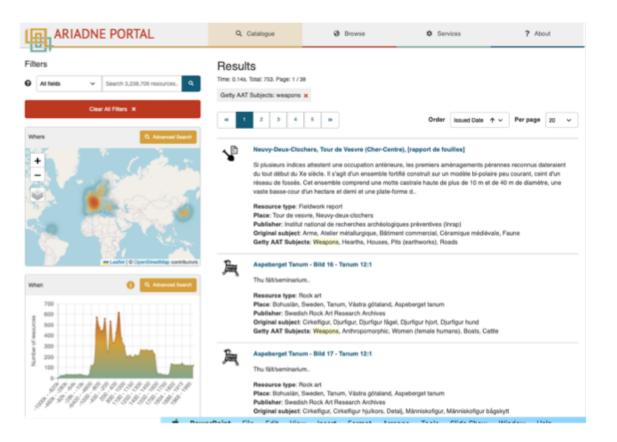
Pages: 1 | 2 | 3 | 4 |>



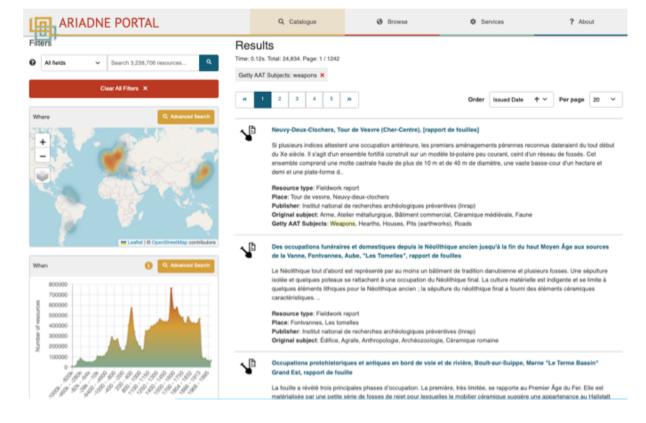


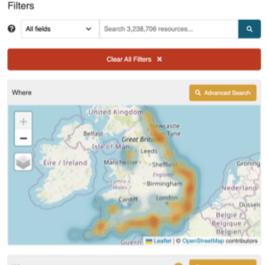
### The power of the Getty AAT hierarchy

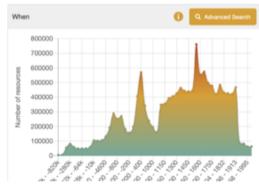
# Searching on "weapons" only: 753 resources



# Searching on "weapons" and narrower terms: 24,834 resources







#### Results

Time: 0.22s. Total: 580. Page: 1 / 29 Getty AAT Subjects: warships X 2 3 4 5 » Colossus Dive Trail Maintenance and Wheel Wreck Dating 2019

This project undertook maintenance of the Colossus dive trail and the collection of further dating evidence from the Wheel Wreck to aid the identification of this wreck. Both sites are protected historic wrecks and are only about six kilometres apart. The rationale behind combining these two

projects was that considerable financial savings can be made by combining the fieldwork into a single event...

Resource type: Maritime Place: World, europe, united kingdom, england, cornwall, scilly, isles of

Publisher: Archaeology Data Service

Original subject: Photogrammetric survey, Photographic survey, Scattered vessel structure, Warship, Shipwreck

Getty AAT Subjects: Warships, Bottles, Ships, Sherds, Wrecks (sites)

### ARIADNE PORTAL

8000000

700000

600000 500000

400000

300000

200000

### Searching on "warships" and narrower terms: 1023 resources



#### **TEARING LEDGE, WESTERN ROCKS**

Designated site assessment carried out of the wreck site, probably that of 'Eagle', part of Sir Clowdisley Shoveli's fleet sur discovered in 1976, could not be dived in 2004...

Resource type: Fieldwork

Place: England, isles of scilly, isles of scilly Publisher: Archaeology Data Service Original subject: Geophysical survey, Warship

Getty AAT Subjects: Warships

#### WARSHIP HAZARDOUS, BRACKELSHAM BAY

Assessment of the Protected Wreck Site to inform future work, this was carried out between 2008 and 2010 as a site eval OASIS Online Form...

Resource type: Fieldwork

Place: England, west sussex, chichester, east wittering

Publisher: Archaeology Data Service

Original subject: Geophysical survey, Warship

Search 3,238,706 resources...

Clear All Filters X

###########

#### Results

Time: 0.11s. Total: 1,023. Page: 1 / 52 Getty AAT Subjects: warships X



#### UNKNOWN: NORTH SEA

SUBMARINE, MARITIME Council: ABERDEEN, CITY OF..

Q. Catalogue

Browse

Resource type: Maritime

Place: Scotland, maritime - aberdeen city of, aberdeen, city of Publisher: Historic Environment Scotland

Original subject: Submarine

#### U-297 [POSSIBLY]: ATLANTIC

SUBMARINE, MARITIME Council: MARITIME.

Resource type: Maritime

Place: Scotland, maritime - offshore, maritime Publisher: Historic Environment Scotland

Original subject: Submarine



SUBMARINE, MARITIME Council: MARITIME.

Resource type: Maritime

Place: Scotland, maritime - offshore, maritime Publisher: Historic Environment Scotland Original subject: Submarine

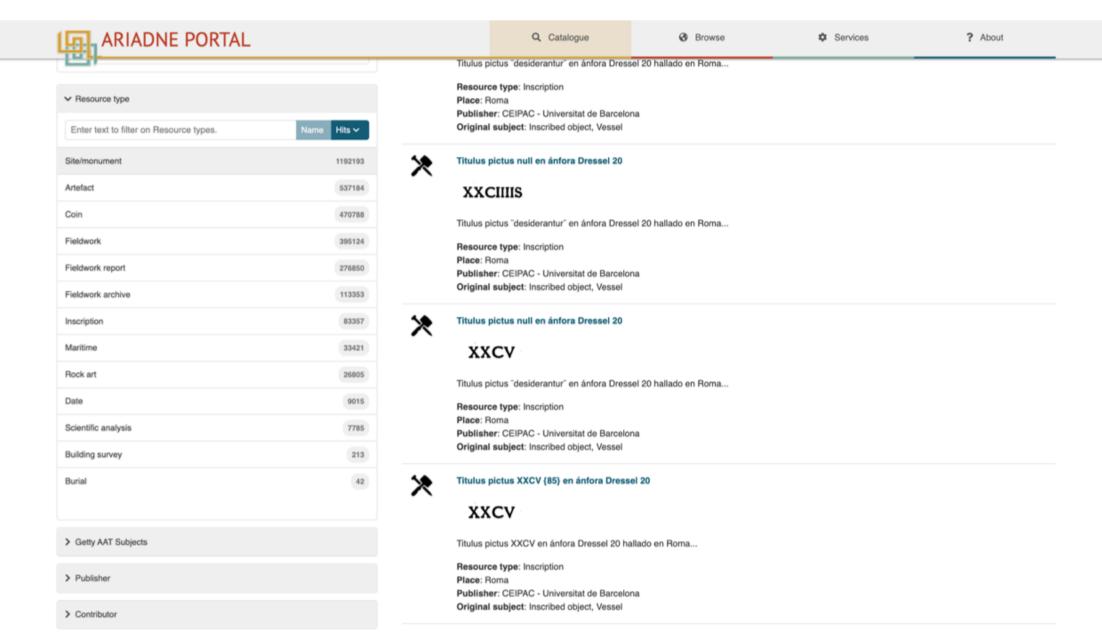


#### UNKNOWN: NORTH CHANNEL



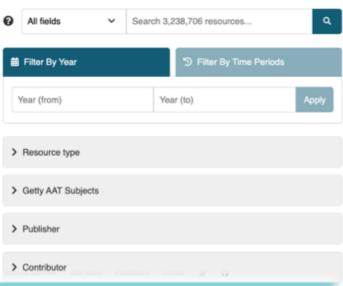


# Thirteen ARIADNEplus resource types



### ARIADNE PORTAL

#### **Filters**



### Period<sub>O</sub>

gazetteer of period definitions for linking and visualizing data.

the period definitions as JSON.



the PeriodO period browser.

#### What is this?

oriodO is a gazetteer of scholarly definitions of istorical, art-historical, and archaeological periods. It eases the task of linking among stasets that define periods differently. It also olps scholars and students see where period lefinitions overlap or diverge.

#### Who are you?

The PeriodO project is led by Adam Rabinowitz (University of Texas at Austin), Ryan Shaw (University of North Carolina at Chapel Hill), and Eric Kansa (OpenContext). Patrick Golden developed the PeriodO software and Sarah Buchanan helped curate the initial dataset. Our work is funded by a Digital Humanities Start-Up Grant from the Office of Digital Humanities at the

National Endowment for the Humanities.

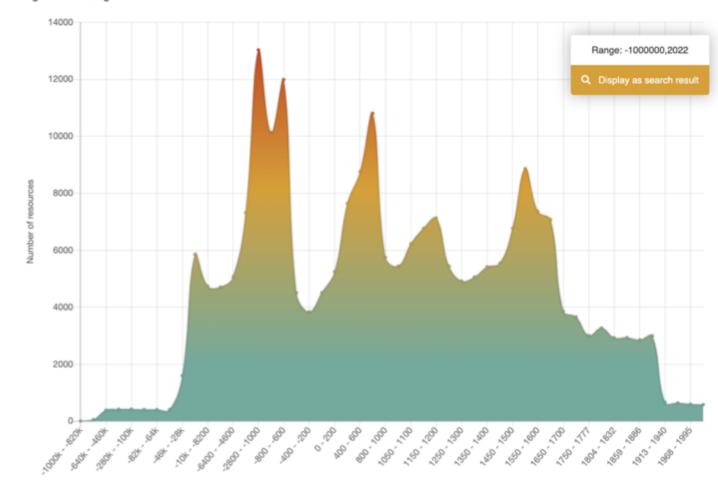
#### Tell me more.

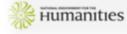
Start by looking at the guide to using PeriodO.

You may also be interested in reading about the motivation for the project or getting a technical overview. Further information can be found in our publications. To keep up with PeriodO developments, follow us on Twitter; @perio\_do. Or contact us and ask whatever you want!

#### Browse when

Scroll on the timeline to zoom. Drag to pan. Hold shift and drag a selection to apply a time range. Click "Display as search result" to search the time range in the catalogue.

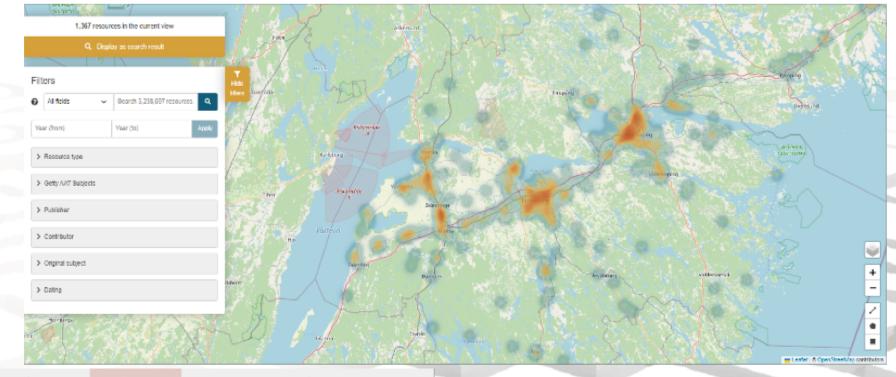


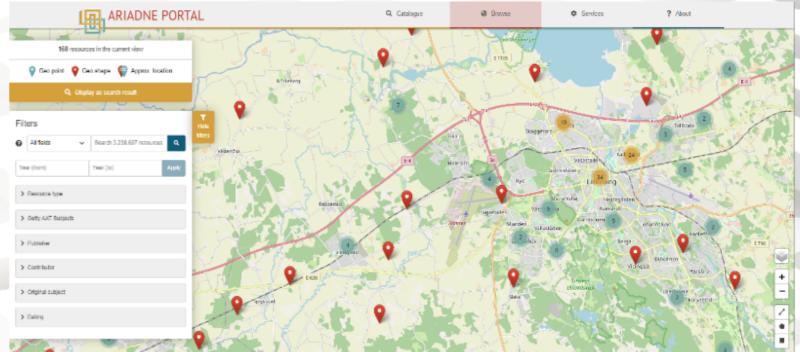






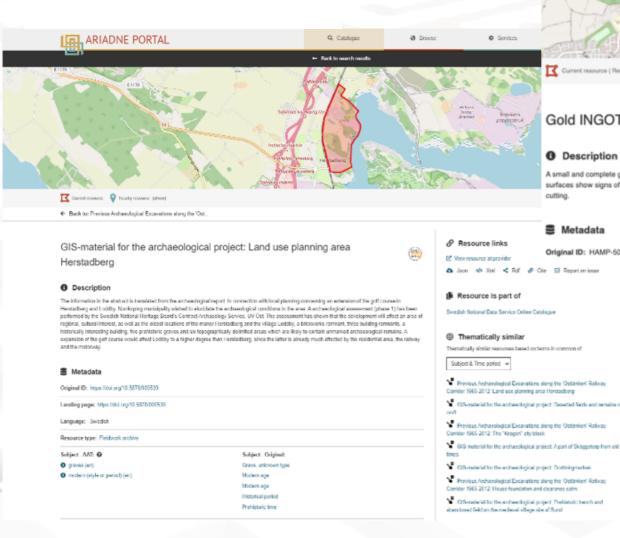
- Latitude
- Longitude

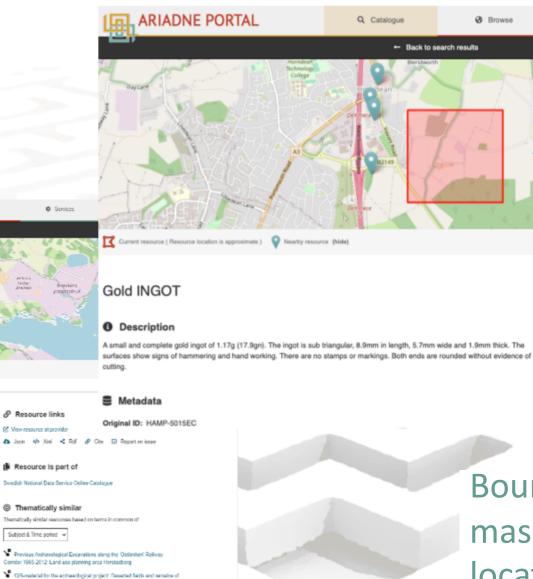




Heat maps Cluster points

### Polygon support





Services

Bounding boxes to mask precise location

@ Resource links

View resource at provider

Resource is part of

Thematically similar

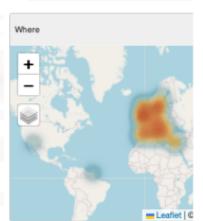
Portable Antiquities Scheme Database

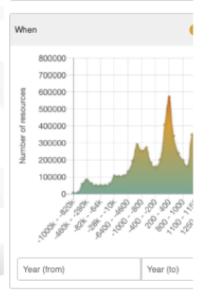
Services

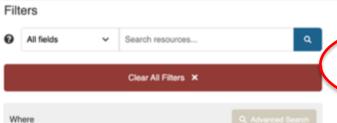
? About

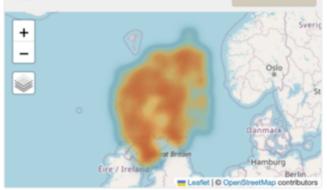
Report an

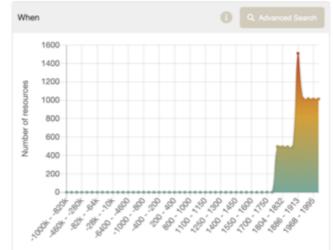














# UNPATH'D WATERS

? About

Browse

#### MALLARD: FIRTH OF FORTH

STEAMSHIP, MARITIME Council: FIFE..

Resource type: Maritime

Place: Scotland, maritime - fife, fife
Publisher: Historic Environment Scotland

Original subject: Steamship Getty AAT Subjects: Steamships

### **UK maritime heritage**

#### **BALLOCHBUIE (POSSIBLY): NORTH SEA**

CRAFT, STEAMSHIP, MARITIME Council: MARITIME ...

Resource type: Maritime

Place: Scotland, maritime - offshore, maritime Publisher: Historic Environment Scotland Original subject: Craft, Steamship Getty AAT Subjects: Steamships, Boats

#### **BALLOCHBUIE [POSSIBLY]: NORTH SEA**

MARITIME Possible instance of: STEAMSHIP Council: FIFE..

Resource type: Maritime

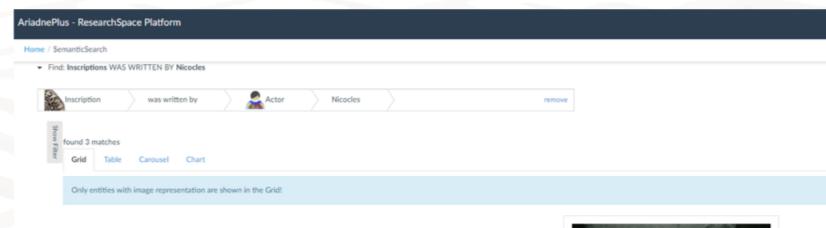
Place: Scotland, maritime - fife, fife
Publisher: Historic Environment Scotland

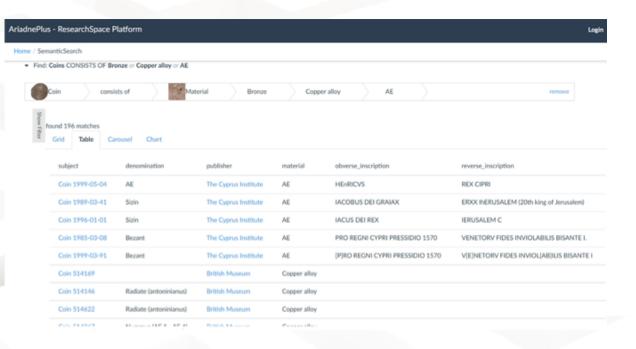
Original subject: Steamship
Getty AAT Subjects: Steamships

#### CHINGFORD: CRAIL, FIRTH OF FORTH

STEAMSHIP, MARITIME Council: FIFE..

















### Consistent use of an ontology is essential

- CIDOC-CRM was broad enough to cover all domains involved but it is important to map to it consistently
- Vocabulary control is also essential
  - Getty AAT very powerful but needs oversight to ensure consistency in partner mappings
- Can't make everything interoperable
  - Focus on key themes
  - What, When, Where; maybe Who?
- Requirement for archaeologists to work closely with IT specialists
  - Always think about how the data will be used
- Granularity and scale are important
  - Collection level vs item level
  - Be driven by research questions

### THANK YOU!

ARIADNEplus is a project funded by the European Commission under the H2020 Programme, contract no. H2020-INFRAIA-2018-1-823914.

https://portal.ariadne-infrastructure.eu

The views and opinions expressed in this presentation are the sole responsibility of the author and do not necessarily reflect the views of the European Commission.

