

What sustainability means in practice



A repository
perspective from the
ADS

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Archaeology Data Service

The ADS: Who we are and what we do

The screenshot shows the ADS website homepage with a red header containing the logo and a search bar. Below the header is a navigation menu with links: HOME, ARCHSEARCH, ARCHIVES, LEARNING, ADS-easy, ADVICE, OUR RESEARCH, BLOG, ABOUT US, LOGIN. The main content area features three large buttons: EXPLORE, DISCOVER, and DEPOSIT. A central section titled 'Featured collection' displays 'England's Rock Art' with a photograph of a rock surface. To the left, a 'Workbook' section explains how to use the site's tools. Below this, a 'History' section mentions the site's recent exploration of the site and archonics. Further down, 'Additional services' are listed, including tailored email alerts and downloadable datasets. The footer contains the University of York logo, legal statements, and social media icons.



- Founded 1996
- Department of Archaeology, University of York
- Collections
 - 1,100,000 metadata records
 - 28,500+ unpublished fieldwork reports
 - 700+ rich archives
- Guides to Good Practice
- DPC Decennial Award 2012



Our 'vision' has remained pretty unchanged

...supports research, learning and teaching with freely available, high quality and dependable digital resources...

...preserving digital data in the long term, and by promoting and disseminating a broad range of data in archaeology...

...promotes good practice in the use of digital data in archaeology...

But...

...there have been a large number of changes in the profession/sector that has meant we continue to 're-align' over the years to keep our ducks in a row..



...including finding a sustainable funding stream

External challenges to sustainability; opportunities and threats

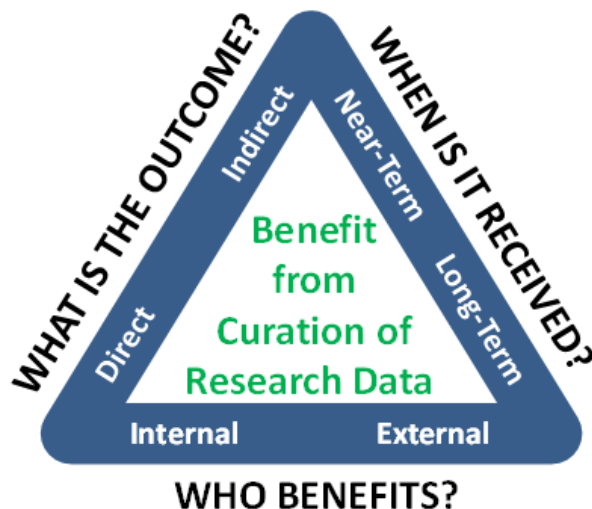
- Fluctuation in development levels
- Changes to RCUK rules re retention of research data
- Level of skills and infrastructure shortage in museums



Charging policy

- Pay to deposit/ free to access
- Assessment of cost based on activities
 - Management and administration (including negotiation of deposit)
 - Ingest
 - Dissemination
 - Storage and Refreshment

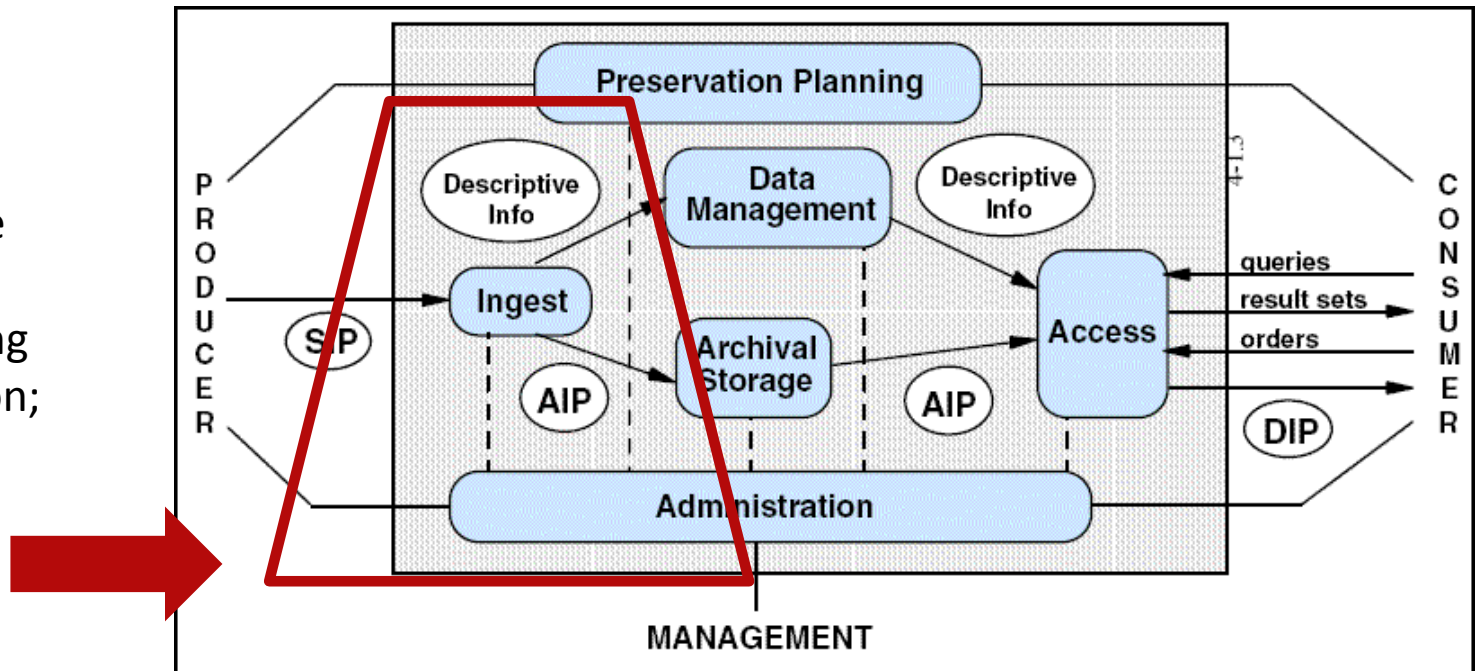
Work with Beagrie's KRDS benefits model and cost framework enabled work on cost identification, similar work could now be done using the Curation Costs Exchange



Trying to reduce costs to encourage deposition

- We follow the Open Archival Information System (OAIS) reference model

This is the area that we have been concentrating our efforts on; to get a well formed SIP and AIP



Archiving Digital Data

After 15+ years experience of digital archiving within archaeology, we are seeing a move toward some organisations submitting digital archives to the ADS as a norm.

Southampton's Designated Archaeology Collections Programme

	<p>Stricklands, Chapel Road, Southampton OASIS ID wessexar1-92058 Excavation 23 Aug 2009 - 27 Sep 2009 Wessex Archaeology</p>
	<p>The Deanery, Chapel Road, Southampton OASIS ID wessexar1-92410 Field evaluation 06 Feb 2006 - 10 Feb 2006 Wessex Archaeology</p>
	<p>The Deanery, Chapel Road, Southampton OASIS ID wessexar1-97044 Open-area excavation 04 Aug 2008 - 22 Oct 2008 Wessex Archaeology</p>
	<p>20-26 College Street, Southampton OASIS ID thamesva1-40314 Field evaluation 28 Jan 2008 - 29 Jan 2008 Thames Valley Archaeological Services</p>
	<p>Woolston Riverside, Southampton SITE CODE SOU1483 Field evaluation 2 Jul 2008 - 18 Dec 2008 Thames Valley Archaeological Services</p>
	<p>The 'Coach House', 16 Bevois Valley Road, Southampton SITE CODE SOU1516 Building Recording 2 Nov 2009 - 12 Nov 2009 Southern Archaeological Services Ltd</p>

Wessex Archaeology Image Archive



Aligning with changing data awareness

The ADS e-archiving system – ADS-easy

ads easy

ADS e-archiving system

Home Costing Calculator About Help [Login]

ADS-easy is a system into which you can upload digital files and associated metadata from archaeological fieldwork and research; on submission these files will be delivered to the ADS for inclusion in our archive.

When should you use ADS-easy?

At least for the time being, ADS-easy is best used for small to medium sized archives, by which we mean archives of around 300 files of a common type. The system works best with projects that contain straightforward file types such as text, images, spreadsheets and CAD files. ADS-easy complements the use of the [OASIS system](#) so is especially useful for depositing the digital outputs of small fieldwork projects where you are happy with a simple archive interface i.e. you don't want an online GIS interface or something similar.

ADS-easy can also accept audio, databases and geophysics files but we currently exclude the upload of 3D laser scanning and larger files due to the limitations of using the web to upload large files.

If you are uncertain about whether you should use ADS-easy please [contact us](#) and we can talk to you about the options.

Register / Login to ADS-easy

[Click here to register for ADS-easy.](#)
If you have already registered, click on the login link on the menu bar above.
If you have forgotten your login password, [please click here.](#)

Latest news about ADS-easy

[August 2013: Bosworth Battlefield Project Archive Launched to Coincide with Battle of Bosworth Anniversary Weekend](#)
[August 2013: Archaeology Britain App Out Now in the App Store](#)
[August 2013: New Research Fellowship - Centre for Digital Heritage](#)

Browsers

* Please note that this site works best with the Firefox, Chrome and Safari browsers

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New Costing Calculator; for estimates and costs

ads easy ADS e-archiving system

Home Costing Calculator About Help [Login]

The costing calculator allows potential depositors to assess the cost, and more effectively plan, for the archiving of data with the Archaeology Data Service using the ADS-easy system

The costings created using the calculator should be regarded as a guide to the potential cost of deposition via ADS-easy and should not be treated as a statement of actual costs. This estimate will be current for the duration of the financial year in which it is calculated (April - March), i.e. an estimate made in January will only be valid until the end of March. **If your project requires a definitive costing (especially for AHRC and NERC funding applications) you are encouraged to contact us directly.**

[Find out more about charging and the costing calculator.](#)

? Project Funding Type: AHRC applicants All other users

? Data Type: File Extension: Quantity:

Data Type	File Extension	Quantity (File)	Unit Price	Unit Price (Total)	Remove
No records found.					

legal statement | contact us

ads JISC THE UNIVERSITY of York

Use it without logging on to work out estimates for project proposals or tenders

ADS-easy gives you a project 'area' or account

A user can see a list of their projects and the status of the projects

The screenshot shows the ADS-easy web interface. At the top, there is a banner with the ADS logo and the text 'ADS e-archiving system'. Below the banner is a navigation menu with links for Home, Projects, Account, About, and Help. The user is logged in as 'Mr Lei Xia' and has a [Logout] button. The main content area is titled 'Projects' and contains the following text: 'Here is a list of all the projects associated with your account. You can search by *Project Title*, or by *Project Status*.' Below this text is a link to 'Create a new project'. A table lists the projects with columns for Project Title, Project Id, Created On, Project Status, and Options. The table contains six rows of project data. At the bottom of the page, there are links for 'legal statement' and 'contact us', and logos for ADS, JISC, and THE UNIVERSITY of York.

Project Title	Project Id	Created On	Project Status	Options
Test2	1000409	18/03/2014	OPEN	Edit Delete
Test Project 3	1000410	19/03/2014	OPEN	Edit Delete
Orpington Hospital	1000424	27/03/2014	SUBMITTED	View
Archaeological Excavation and Watching Brief, Dundee Leisure Pool	1000425	27/03/2014	OPEN	Edit Delete
Test Project	1000402	12/03/2014	OPEN	Edit Delete
Badger - Test please ignore	1000423	27/03/2014	SUBMITTED	View

Step 1: insert project level resource discovery details

Home Projects Account About Help Mr Lei Xia [Logout]

Step 1: Project Details | Step 2: File Upload | Step 3: Archive Management | Step 4: File-level Metadata | Step 5: Submit Project | Step 6: Documentation

[?] In order to start depositing we need a little more information about your project. Please fill out the project details below. If you are unsure what to put in each section then please [go to the help page](#). It is important that this information is as accurate and complete as possible as it will form the resource discovery metadata which will allow others to find your project data.

*Fields marked with * are mandatory*

[?] Project Name*	My lovely project	
[?] Description*	lovely project 3986 characters remaining	
[?] Languages* <input type="button" value="Add"/>	UK English <input type="button" value="Remove"/>	
[?] Identifiers <input type="button" value="Add"/>	Contracting Unit No. <input type="button" value="Remove"/>	Identifier: 123456 <input type="button" value="Remove"/>
[?] Related Resources <input type="button" value="Add"/>		
[?] Fieldwork Dates	Start Date: 01/Apr/2014	End Date: 02/Apr/2014
[?] Data Creation Dates*	Start Date: 01/Apr/2014	End Date: 02/Apr/2014
[?] Project Funders <input type="button" value="Add"/>		
[?] Copyright Holders* <input type="button" value="Add"/>	<input type="radio"/> Person <input type="radio"/> Organization <input checked="" type="radio"/> Both First Name: Lei Last Name: Xia Organisation: Archaeology Data Service Email: xlfm2@hotmail.com <input type="button" value="Remove"/>	
[?] Licence Holders* <input type="button" value="Add"/>	<input type="radio"/> Person <input type="radio"/> Organization <input checked="" type="radio"/> Both First Name: Lei Last Name: Xia Organisation: Archaeology Data Service Email: xlfm2@hotmail.com <input type="button" value="Remove"/>	

The fields are controlled to encourage proper use of standards and fulfil the ADS archive requirements

Step 2: Upload the files you want to include

The screenshot shows the ADS e-archiving system interface. At the top, there is a banner with the 'ads easy' logo on the left and 'ADS e-archiving system' on the right, set against a background of ancient cave paintings. Below the banner is a navigation menu with links for 'Home', 'Projects', 'Account', 'About', and 'Help'. On the right side of the menu, the user is identified as 'Mr Lei Xia' with a '[Logout]' link. A progress bar below the menu shows six steps: 'Step 1: Project Details', 'Step 2: File Upload' (which is highlighted), 'Step 3: Archive Management', 'Step 4: File-level Metadata', 'Step 5: Submit Project', and 'Step 6: Documentation'. The main content area contains a help message for Step 2, starting with a question mark icon and stating: 'Before uploading your data we ask that depositors take time to read the instructions as we have some specific requirements. While the ADS is able to accept most of the major file formats there are some which may be problematic, consequently we ask that you consult our list of preferred or accepted formats before uploading any data. If you have a preferred format that does not appear in the list then contact us for more information. Please ensure your files adhere to our file naming strategy. The ADS also provides some guidance on selecting material for deposition.' Below this are two specific instructions: 'Uploading GIS or Geophysics data? Please read the special instructions for uploading these files.' and 'Uploading a folder(s) or entire archive? Please read the special instructions for uploading an entire archive.' There is a green 'Upload my data' button and a final instruction: 'Once you have finished uploading data you should move to Step 3: Archive Management.' At the bottom of the page, there are links for 'legal statement' and 'contact us'.

File upload online

File Upload Tool

[?] You can now add data to your project. This can be done by 'dragging and dropping', or selecting 'Choose' and navigating to the file(s) on your computer/network.

Uploading GIS or Geophysics data? Please read the special instructions for uploading these files.

Uploading a folder(s) or entire archive? Please read the special instructions for uploading an entire archive.

If you are uploading single files, or zipped groups of GIS or Geophysics data, then please use the upper file upload tool.

If you are uploading a folder, or an entire archive consisting of a group of folders, these should be zipped together and uploaded into the lower area. Do not use the lower upload box for GIS/Geophysics data, these should be extracted from an archive, zipped up separately and uploaded using the upper upload tool.

Any files you have upload during this session will appear in the box to the right of the associated upload box. N.B. If you have uploaded a project using ADS-easy then these files will also appear in the uploaded file area. These files will not be included in your archive, concerned you should logout, and log back in to start a new session.

Use the area below to upload files, or zipped groups of GIS or Geophysics data. Please select the 'Choose' button or drag files into the (Note: there is a maximum file size of 20MB per file).

←Choose Upload →Cancel

Drag and Drop files into this box

[?] These are the files you uploaded during this session:

Use the area below to upload folders of files or an archive (in a zip): If you would like to upload an entire archive of one or more folders, gro together in a zip file. Do not use this area to upload GIS or Geophysics data. Please select the 'Choose' button or drag the zip into the space there is a maximum file size of 80MB per zip).

←Choose Upload →Cancel

Drag and Drop files into this box

[?] These are the zip files uploaded during this ses:

Use the area below to **upload folders of files or an archive (in a zip)**: If you would like to upload an entire archive of one or more folders, group them together in a zip file. Do not use this area to upload GIS or Geophysics data. Please select the 'Choose' button or drag the zip into the space below. (Note: there is a maximum file size of 80MB per zip).

←Choose Upload →Cancel

Drag and Drop files into this box

Finish Uploading Files

legal statement | contact us

File Upload Tool

[?] You can now add data to your project. This can be done by 'dragging and dropping', or selecting 'Choose' and navigating to the file(s) on your computer/network.

Uploading GIS or Geophysics data? Please read the special instructions for uploading these files.

Uploading a folder(s) or entire archive? Please read the special instructions for uploading an entire archive.

If you are uploading single files, or zipped groups of GIS or Geophysics data, then please use the upper file upload tool.

If you are uploading a folder, or an entire archive consisting of a group of folders, these should be zipped together and uploaded into the lower area. Do not use the lower upload box for GIS/Geophysics data, these should be extracted from an archive, zipped up separately and uploaded using the upper upload tool.

Any files you have upload during this session will appear in the box to the right of the associated upload box. N.B. If you have uploaded data to another project using ADS-easy then these files will also appear in the uploaded file area. These files will not be included in your archive, but if you are concerned you should logout, and log back in to start a new session.

Use the area below to **upload files, or zipped groups of GIS or Geophysics data**. Please select the 'Choose' button or drag files into the space below (Note: there is a maximum file size of 20MB per file).

←Choose Upload →Cancel

Drag and Drop files into this box

[?] These are the files you have uploaded during this session:

- Catering.pdf ✓
- Teleconference Log In Details.doc ✓
- Image10.tif ✓

Drag and drop files or zips; or browse and choose the files. They are listed as they are uploaded

Step 3: Manage you archive and cost the archive

- See a list of your files
- Allocate a data type to help with file level metadata
- Delete what you don't want
- Calculate the archive cost
- Save your costing info

Home Projects Account About Help Mr Lei Xia [Logout]

Step 1: Project Details | Step 2: File Upload | **Step 3: Archive Management** | Step 4: File-level Metadata | Step 5: Submit Project | Step 6: Documentation

[?] Once you have uploaded data to your project area (Step 2) your files should appear in the table below, but in order to proceed we need a little more information about your data ('data type' and 'file extension'). To do this we need you to manually set the appropriate 'data type' for each file and add the correct 'file extension' from the drop down lists. It is important that this completed correctly as it has ramifications for the creation of the correct file-level metadata.

When this is complete you can more effectively manage your data (remove files), and see how much your archiving will ultimately cost (appears below the file management window). **N.B. Please take care when changing or removing information as this can result in loss of data and metadata.**

Once you are happy with your archive, please save a costing below and then move on to Step 4: File-level Metadata.

Filter: <input type="text"/>	Assoc Files	Filesize	Data Type	File Extension	Status	
Catering.pdf	0	20.4 KB	Text <input type="text" value="Text"/>	pdf <input type="text" value="pdf"/>	SELECTED	<input type="checkbox"/>
Teleconference Log In Details.doc	0	27 KB	Text <input type="text" value="Text"/>	doc <input type="text" value="doc"/>	SELECTED	<input type="checkbox"/>
Image10.tif	0	364.8 KB	Images (Raster) <input type="text" value="Images (Raster)"/>	tif <input type="text" value="tif"/>	SELECTED	<input type="checkbox"/>

Costing

This section allows you to see how much your archiving will cost. You can 'Save' this costing for your records and we will invoice you for the amount required.

[?] Project Funding Type: AHRC applicants All other users

Subtotal (excl. VAT):	£6.00
TOTAL (incl. £150.00 project start up fee & VAT 20%):	£187.20
If you choose to deposit by traditional methods, the estimated price is considerably higher at:	£254.40

Step 4: Complete file level metadata for the files

Home Projects Account About Help Mr Lei Xia [Logout]

Step 1: Project Details
Step 2: File Upload
Step 3: Archive Management
Step 4: File-level Metadata
Step 5: Submit Project
Step 6: Documentation

In this section you can create file-level metadata for your files. Simply click the 'Edit' button and the appropriate file metadata form will appear. Complete this form and click on the button at the bottom to return to this page. Once you have completed the appropriate metadata, 'Status' will change from 'Pending' to 'Completed' in the 'Step 4: File level metadata' area; and from 'Selected' to 'Completed' in the 'Step 3: Archive Management' area.

You can also 'Delete' a file and its metadata at any stage, although once it has been deleted the metadata cannot be recovered.

If you have a lot of image files, please download an image file template.

Image (Raster) Objects:

Search Filename:	Data Type	File Ext	Status	Options
Image10.tif	Image	tif	COMPLETED	<input type="button" value="Edit"/> <input type="button" value="Delete"/>

When you have completed a template, [please click here to upload it using the Template File Upload Tool](#).

Text Objects:

Search Filename:	Data Type	File Ext	Status	Options
Catering.pdf	Text	pdf	PENDING	<input type="button" value="Edit"/> <input type="button" value="Delete"/>
Teleconference Log In Details.doc	Text	doc	PENDING	<input type="button" value="Edit"/> <input type="button" value="Delete"/>

Either use a web form or upload a spreadsheet template

Step 5 and 6: Administer and submit your project

Step 1: Project Details | Step 2: File Upload | Step 3: Archive Management | Step 4: File-level Metadata | **Step 5: Submit Project** | Step 6: Documentation

When you have completed the necessary metadata, and completed all the other steps then you can 'Submit' your archive.

Before submission you can [view a summary of your project here](#). If there are any problems then you can return to the appropriate section and make any changes. **Once the project has been submitted you will not be able to change or edit the documentation, deposit or metadata, so please take time to ensure that it is correct.**

Additional Information:
If there is any information about your project which you think may be useful to us, then you can add a message in the box below.

PLEASE ARCHIVE MY IMAGE PROMPTLY! 1487 characters remaining

Embargo:
When archiving digital data it is important that the data is archived (accessioned and the correct format with the appropriate documentation to ensure its long term preservation immediately made accessible to the public. If you think it appropriate to establish an embargo in the archive, but not accessible to the public then you can add a date here. Once the data is made publicly accessible. If you are considering an embargo date then please read [on the deposition of sensitive data](#).

If you do not need to set an embargo date then leave this blank.

Embargo Date:

Notification:
If you would like to notify a person or other organisation about your submission, please use the boxes below. An automated email will then be sent letting the individual/organisation know. Possible include direct this to your contact within an organisation.

Email:

Message: 1480 characters remaining

- Tell curators about your archive
- Add an embargo
- Keep a copy of your costing

Home Projects Account About Help Mr Lei Xia [Logout]

Step 1: Project Details | Step 2: File Upload | Step 3: Archive Management | Step 4: File-level Metadata | **Step 5: Submit Project** | Step 6: Documentation

Saved Quote (Finance)

Quote ID	Date	Total Cost	Options
INVOICE_1000431	16 Apr 2014	£181.20	<input type="button" value="Download"/> <input type="button" value="Delete"/>

Quote successfully saved, you can download/delete it from Documentation section.

[legal statement](#) | [contact us](#)

Internal alignment and Project Management: Collection Management System

● These archives are waiting to be allocated: <input type="text" value="-- select project --"/> <input type="text" value="-- select user --"/> <input type="button" value="Allocate"/> Back to top						
Tracking Id	Tracking Title		Licence	Username	Notes	
1004283	An Archaeology of Literacy and the Church in Southern England to AD750		SIGNED	N/A	WGK is going to tidy up the files (removing highlighting etc) before we go ahead	
1002176	Council for British Archaeology (CBA) Occasional Papers		SIGNED	N/A	periodically updated	
1003376	Detection of Archaeological Residues using remote sensing Techniques (DART) - Geophysical data		NO	N/A	awaiting the rest of the data (just GPR and GIS) with overview text which is yet to be uploaded to CKAN!	
1003413	Garton Wetwang Slack		SENT	N/A		
1004671	Hanley Hall, Gilberts End, Worcestershire		SENT	N/A	This project was initiated via ADS-easy (project id 1000497)	
1001959	Ipswich Backlog Excavation Archive		SIGNED	N/A	Contains 13585 files, 165GB. Waiting for replacement metadata files.	
1003608	Lake District National Park Survey		NO	N/A	still awaiting metadata and have other queries about copyright to the data he has given us	
1001872	London Archaeologist Journal		SIGNED	N/A	9/2/11 Agreed with Clive Orton that we would be charging £300 + VAT for each annual batch of 4 issues and a supplement (every 3 years they produce one volume of 12 issues and 3 supplements)	
1001682	Proceedings of the Society of Antiquaries of Scotland		SIGNED	N/A	http://ads.ahds.ac.uk/catalogue/library/psas/	

● These archives are waiting to be allocated/AIP'd <input type="text" value="-- select project --"/> <input type="text" value="-- select user --"/> <input type="button" value="Allocate"/> Back to top						
Tracking Id	Tracking Title		Licence	Username	Notes	
1001640	Scottish Archaeological Internet Reports		SIGNED	kjn103	Advice given to SAIR on digital links and archives (see also DASA)	
1001577	Sussex Archaeological Collections		SIGNED	jg1063	Only one licence required: covers all volumes. Dates given here relating to licence are given on all SAC tracking records, and refer to the sole licence.	
1004591	The Prehistory of Britain and Ireland		SIGNED	kjn103		

● These archives have a deposit but these are waiting to be released: Back to top						
Tracking Id	Tracking Id	Tracking Title		Licence	Username	Notes
1002381	Aggregate extraction rela	1002204	Northern Ireland Sites and Monuments Record	SIGNED	jg1063	All loaded - waiting for Lei to sort a hiccup with the solr indexing so that 16571 records show in archsearch facet rather than 16301
1003447	Chard Junction Quarry, Dorset	1004407	Ridge Cross, Stockland	SENT	jr949	Waiting for licence (email reminder sent 15/09/2014). Second reminder sent 22/10/2014.
1004039	Excavations in Medieval S	1004599	Shotton Triangle Site, Northumberland, Archaeological Evaluation (OASIS ID: adarchae1-163165)	SIGNED	rhm103	This project was initiated via ADS-easy (project id 1000476)
1003450	Glastonbury Abbey: Archae	1004598	Watching brief Eastgate, Hexham (OASIS ID: gerymar1-175289)	SIGNED	rhm103	This project was initiated via ADS-easy (project id 1000481)
1001837	Later Prehistoric Pottery G					
1002512	Lynford Quarry					
1002495	North Park Farm, Bletchinc					

● These archives are embargoed: Back to top						
Tracking Id	Tracking Title		Licence	Username	Notes	
1003366	Nottinghamshire Aggregate Resource Assessment					
1003545	Prehistoric Pottery Production in Chamwood Forest					
1004452	Terrestrial mineral resource assessment: Buckinghamshire					
1004408	Woodstown Viking-Age settlement, Co. Waterford					
1004247	North Yorkshire County Council Grey Literature Reports		SIGNED	jr949	discarded and some of the reports with issues have been excluded from this to be dealt with when my queries have been answered by the depositor). For these 1715 files metadata has been created to be entered into the following Grey Lit Library tables: Biblio1, Biblio_Auths, Files, Grid_Refs and Location. The grid reference and location information have largely been extracted by Lei's NLP work with the gaps filled in manually. The Mon_Finds table has been put on hold as it will currently take too much time, but may be a combined NLP/crowd-sourcing task for the future. Michael is currently working on a script to import the metadata I have created into the Grey Lit tables.	
1003209	Northumberland and Durham Rock Art Project		SIGNED	jg1063	Archive needs tidying	

Benefits of this approach for sustainability

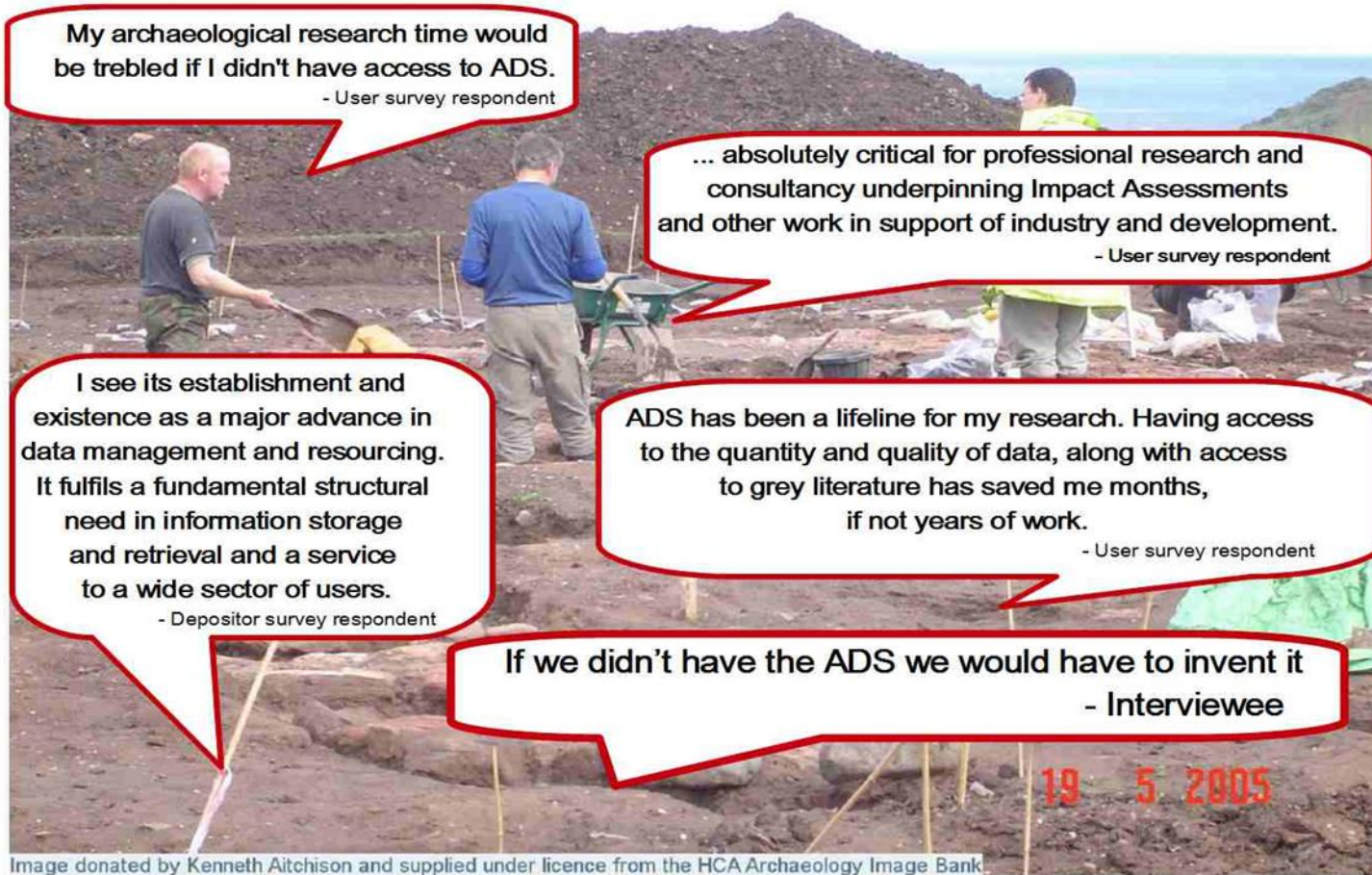
- Pass some costs savings to depositor
- Delivery of better formed SIPs
- Semi automation of internal preservation and dissemination functions
- Ability to deal with higher volumes of deposits
- More attractive to depositors and funders/curators
- More predictable 'turn over' of deposits and funding
- Doesn't exclude 'traditional' deposit...

And to close the circle...

- Attracts reuse of different archives in synthesis research
- Reuse attracts deposition and funding.....



What evidence is there that it works? The IMPACT project results



ADS Value/Impact Analysis

Analysis in Progress

Example - Returns over 30 years?

Increase in returns on investment in data and related infrastructure arising from additional use facilitated by ADS

£1 cost provides up to £8.30 return



One tool in an armoury

Having a deposition system based on financial modelling is ONE tool that is supported by a range of activities that underpin sustainability ...

R & D opportunities

User access and help

Audience development

Guidance and standards

Accreditation

... all help to embed the ADS as a 'service'
not a project.



Keep in touch



Follow us on Twitter:
@ADS_Update



Friend us on Facebook:
<http://www.facebook.com/archaeology.data.service>

catherine.hardman@york.ac.uk