	A	B	C	D	E
1	'		**Identification scheme**	'	'
2	Axes	Criterion	DOI	ARK	OID
3	ID Assignment / Maintenance Issues	1. What is relationship with URI (Addresses unique identifier capability)? (Addresses unique identifier capability, and interoperability)	Uniform Resource Identifier (RFC 3986) provides an extensible means for identifying a resource within the World Wide Web. The syntax for Uniform Resource Identifiers (URIs) is much more restrictive than the syntax for the DOI. DOIs can identify physical objects as well as digital objects and may be used in applications other than the WWW or Internet. DOI is registered with info URI scheme (RFC 4452: http://info-uri.info) that was developed by library and publishing communities for "URIs of information assets that have identifiers in public namespaces but have no representation within the URI allocation".	An ARK is a URL, and so can be considered a URI. Unlike a URI, an ARK can be assigned to any type of object: digital objects, physical objects, living beings and groups, and intangible objects.	Not a URI.
4		2. What is relationship with URL (one of the main citable locator schemes)?	As a Uniform Resource Identifiers (URIs), the Uniform Resource Locator (URL) syntax is much more restrictive than the syntax for the DOI. When DOIs are embedded in URLs, they must follow the URL syntax conventions. A DOI name may be represented as a URL (http string) by prefacing the string http://dx.doi.org/ to the DOI of the document (e.g., to resolve the DOI name 10.1000/182, enter into a browser the address: http://dx.doi.org/10.1000/182). Web pages or other hypertext documents can include hypertext links in this form.	An ARK is a URL, but has specific syntax requirements for the "label" part of the URL. [http://NMAH/]ark:/NAAN/Name[Qualifier]. The NAAN is the Name Assigning Authority Number - mandatory unique identifier of the organization that originally named the object; the NMAH is the Name Mapping Authority Host - optional and replaceable hostname of an organization that currently provides service for the object; the Qualifier is an optional string that extends the base ARK to support access to individual hierarchical subcomponents of an object[1], and to variants (versions, languages, formats) of components.	Not a URL. Does not support use as a locator.

	A	B	C	D	E
5		3. What is relationship with URN (as internet naming scheme)?	DOI is not registered as a URN namespace, despite fulfilling all the functional requirements, since URN registration appears to offer no advantage to the DOI System. It requires an additional layer of administration for defining DOI as a URN namespace (the string urn:doi:10.1000/1 rather than the simpler doi:10.1000/1) and an additional step of unnecessary redirection to access the resolution service, already achieved through either http proxy or native resolution.	URNs are designed to describe an identity rather than a location; thus, because an ARK as a URL specifies a location (along with an implied commitment to persistence by virtue of its specific syntaxz), it is not a URN. Also, URN namespace assignments are handled via the IANA, the Internet Assigned Numbers Authority. Namespaces for the ARK are maintained as part of the NAAN Registry which is maintained by the California Digital Library and replicated at the Bibliothèque Nationale de France and the National_Library_of_Medicine.	Can be expressed as a URN by prepending "urn:oid:".
6		4. What are roles & rights for roles to assign IDs, delete IDs, edit IDs or associated MD?	With EZID service, one or more (?) user names / passwords can be set up using groups for an account to assign IDs, add and edit required and optional descriptive metadata about the resource. IDs cannot be deleted or edited after creation. IDs can be added one by one or via the use of an API for batchloading. All rights are associated with the user name; any restrictions would have to be managed by the account holder.	To mint ARKs, you may use any software that can produce identifiers conforming to the ARK specification such as the open-source "noid" software, which creates minters and accepts commands that operate them. The noid software documentation explains how to use noid not only to mint identifiers but also to serve as an institution's "identifier resolver". The EZID Service provided by the California Digital Library also mints ARKs under the same arrangements described as with DOI assignment.	User takes on all responsibility for managing a namespace. There is no batch mechanism for creating root namespaces.
7		5. Is it possible to batch create identifiers? If so, how done? (Addresses scalability)	An Application Programming Interface is available for batching creation of DOIs from the EZID service.	An Application Programming Interface is available for batching creation of ARKs from the EZID service.	See above.

	A	B	C	D	E
8		6. Is a registry or registration service required or provided? (Addresses third party maintenance)	There are several services available that provide registration of DOIs with the DOI Registry: CrossRef used quite extensively for traditional published resources, such as journal articles, books, etc. CrossRef has less experience with datasets and other non-traditional resources. EZID is a service offered by the CDL in conjunction with the DataCite Consortium. EZID was chosen for the testbed because of its focus upon assigning IDs to data sets.	EZID is a service offered by the CDL that registers Name Authority Agencies and Name Mapping Hostports for ARKs. EZID was chosen for the testbed because of its focus upon assigning IDs to data sets, and because it could assign both DOIs and ARKs.	There are several informal, best-effort registries.
9		7. If a registry service is available, what are the services provided?	At this time, the EZID service provides identifier creation and resolution, as well as metadata entry and maintenance services. EZID's DOI services are dependent upon services provided by two external entities: DOI Registry services--German National Library of Science and Technology (TIB); DOI Resolution services-- International DOI Foundation (IDF) and the Handle System.	Included in the ARK specification are generic service definitions for description, access & location, and generic policy services for declarations of object permanence, object naming, object fragment addressing, and operational service support, etc. The EZID Service can provide all these services, if full use is made of these ARK capabilities.	Lookup.

	A	B	C	D	E
10		8. Is a specific naming scheme and/or naming authority required?	The system behind the DOI ID Scheme is the Handle System, and as such must meet any Handle restrictions for naming. Neither the Handle System nor DOI system policies, nor any web use currently imaginable, impose any constraints on the suffix, outside of encoding. Handle syntax imposes two constraints on the prefix — both slash and dot are "reserved characters", with the slash separating the prefix from the suffix and the dot used to extend sub prefixes. The root administrator for the Handle System has reserved all prefixes starting with "10." (for example 10.1000, 10.1000.1, 10.23) for the IDF to use for DOI names.	The part of the ARK directly following the "ark:" is the Name Assigning Authority Number (NAAN) enclosed in `/' (slash) characters. This part is always required, as it identifies the organization that originally assigned the Name of the object. It is used to discover a currently valid NMAH and to provide top-level partitioning of the space of all ARKs. NAANs are registered in a manner similar to URN Namespaces. Namespaces for the ARK Name Authority are maintained as part of the NAAN Registry that is maintained by the California Digital Library and replicated at the Bibliothèque Nationale de France and the National Library of Medicine.	Yes.
11		9. What is the ID for the data set level digital object? For the component level digital object?	MODIS data set: doi:10.5060/D4CC0XMZ; Granule within MODIS data set: NSIDC glacier photo collection, doi:10.5060/D4RN35SD; Glacier photo within collection: doi:10.5060/D4RN35SD/baird1929090101 for the photo with local ID baird1929090101.		No difference.

	A	B	C	D	E
12		10. What is the technical infrastructure upon which the implementation of the ID scheme is based (e.g., XML, Java, Python, other)?			No infrastructure.
13		11. What is the mechanism for ensuring uniqueness of the ID within the ID provider system and/or globally?	The DOIs that are created by the EZID service are registered with the DOI Registry services provided by the German National Library of Science and Technology (TIB). The EZID service for managing identifiers populates and updates the databases of the DOI/Handle resolver services provided by the International DOI Foundation (IDF) and the Handle System.	The EZID service for managing identifiers populates and updates the N2T database for the ARK system.	
14		12. Is there a way to declare or describe a relationship between / among different formats of the same intellectural content within the ID itself? (Addresses semantic equivalence)	There are no restrictions on the naming of the resource after the required prefix / suffix of the DOI (10.1000/) so the DOI could include semantic information about the resource, if desired. The EZID service also provides a mechanism for automatic creation of an opaque identifier containing no semantic information that could become out of date and require maintenance, a recommeded best practice.	ARK labels can be extended with less opaque extensions that reference sub-objects in support of the object (e.g., numeric references to versions, formats, languages, etc). This capability is not used extensively at this point.	No.

	A	B	C	D	E
15	Discovery Issues	1. Who is using the scheme and for what purpose(s)?	DOIs are most widely used for printed publications such as journals, but are beginning to be used more frequently for data sets.	In 2011, there were about 80 Name Assigning Authority Numbers (NAANs),mostly universities & archives. Some ARKs were being used for unique identification & location of resources within digital repositories or archives.	Mostly used for registering organizations and names in protocols.
16		2. If used as citation for publication, are the citations counted by aggregators (e.g., ISI or Thomson's Web of Science)	Thomson-Reuters has just announced the creation of a Data Citation Index that would make use of DOIs for data sets. The new index was announced in June 2012.	No.	No.
17		3. Is it possible or recommended that descriptive metadata be associated with the ID? If so, how maintained?	Yes, the DOI Foundation recommends the creation of descriptive metadata for the resource identifiede by a DOI. While there are many descriptive metadata schemes that could be used, the DataCite DOI that have been assigned in the testbed require 5 elements, and recommend many more. The EZID service allows & facilitates the creation of the descriptive metadata. Continued maintenance of the metadata is done by the current account holder for the resource which may be re-assigned if an identifier appears to be abandoned. DataCite also recommends the creation of a "landing page" that could display the descriptive metadata.	Yes, using the same mechanism as used for DOIs by the EZID service. If the EZID service is not being used, maintenance of the descriptive metadata would need to be done by the data provider or account holder.	Yes.
18		4. Can the identifier have semantics? If so, what part / how?	There are no restrictions on the naming of the resource after the required prefix / suffix of the DOI (10.1000/) so the DOI could include semantic information about the resource, if desired.	ARK labels can be extended with less opaque extensions that reference sub-objects in support of the object (e.g., numeric references to versions, formats, languages, etc). This capability is not used extensively at this point.	No.

	A	B	C	D	E
19	Archival Issues	1. How is the association between the ID and the resource maintained when transferred from one archive or repository to another (e.g., embedded within object?)	The mechanism will change depending upon the service provider, but is dependent upon updating the descriptive metadata to record the changes in the responsible organization. (Is this true?) Maintenance of the identifier can be changed by the EZID Service by request or by ddefault if an identifier is "abandoned."	The mechanism will change depending upon the service provider, but is dependent upon updating the descriptive metadata to record the changes in the responsible organization. (Is this true?) Maintenance of the identifier can be changed by the EZID Service by request or by ddefault if an identifier is "abandoned."	Not specified.
20		2. What are the outright charges or costs involved in assigning the IDs or using an associated service? (initial and ongoing on annual basis)	There are no charges for the creation or maintenance of a DOI on a per ID basis. The EZID service does charge an annual fee for creation and maintenance of an unlimited number of DOIs, based on organization size.	There are no charges for the creation or maintenance of an ARK on a per ID basis. The EZID service does charge an annual fee for creation and maintenance of an unlimited number of ARKs, based on organization size.	Substantial costs in building the necessary infrastructure.
21		3. What kind of staff resources are required to implement the scheme, associated software or service? (type, knowledge needed)	If the choice is made to create one DOI at a time, the only requirement is to be able to define & differentiate what is to be uniquely (and separately) identified, and create / add descriptive metadata for the resource. If the API is to be used, a staff person would be required competent to configure the API and make it available for broader use.	If the choice is made to create one DOI at a time, the only requirement is to be able to define & differentiate what is to be uniquely (and separately) identified, and create / add descriptive metadata for the resource. If the API is to be used, a staff person would be required competent to configure the API and make it available for broader use.	User assumes all responsibility; there is no central infrastructure.
22		4. Does the identification scheme have a mechanism for association with related data objects, such as physical documentation or an associated spreadsheet? handle data that is not on the web? What about physical objects?	The DOI can be associated with any kind of object, whether physical or digital. It is described within the DOI Handbook as a "digital identifier for an object not an identifier for a digital object".	The ARK can be associated with any kind of object, whether physical or digital.	No.
23					

	F	G	H	I	J
1	'	'	'	'	'
2	PURL	Handles	UUID	XRI	LSID
3	A PURL is a URL, and so can be considered a URI. PURLs are usually assigned only to digital objects that are locatable on the WWW.				
4	A PURL is a URL, but has no specific or proprietary syntax for the naming part of the URL.				

	F	G	H	I	J
5	A PURL can become a URN by attaching the requisite URN: path prefix and adding a naming authority (/org/oclc) in front of the name (/purl/keith/home),as in URN:/org/oclc/purl/keith/home.				
6	PURLs can be created by *registered user* s who may belong to *groups,* and who are therefore included on *access lists* with the rights to read, write and/or maintain PURLs and PURL domains, on a given PURL Server. PURLs can also be modified (by submitting a PURL of type *clone),* searched, validated, or rendered null (causing a history page to be returned noting the deprecation of a PURL) by registered users.				
7	PURLs can be batch created and modified by registered users by submitting an XML document from an input schema using the RELAX NG syntax. Batch operations are not available for searching or rendering PURLs null.				

	F	G	H	I	J
8	The registration of a PURL is done by a given PURL Resolver.	The interoperable network of distributed handle resolver servers (also known as the Proxy Server System) are linked through a Global Resolver (which is one logical entity though physically decentralised and mirrored). Users of Handle System technology obtain a handle prefix created in the Global Handle Registry¨. The Global Handle Registry maintains and resolves the prefixes of locally-maintained handle services. Any local handle service can, therefore, resolve any handle through the Global Resolver.			
9	A PURL Resolver should be able to allow the creation, validation, modification, searching and rendering a PURL "null" (not deleting) within its database.				

	F	G	H	I	J
10	PURLs use the URL syntax for the name portion of the ID, with some exceptions. Allowed and not allowed characters are described on the PURL FAQ: http://purl.oclc.org/docs/faq.html.	Handles (identifiers) are passed by a client, as a query of the naming authority/prefix, to the Handle System's Global Handle Registry (GHR). The GHR responds by sending the client the location information for the relevant Local Handle Service (which may consist of multiple servers in multiple sites); a query is then sent to the relevant server within the Local Handle Service. The Local Handle Service returns the information needed to acquire the resource, e.g., a URL which can then be turned into an HTTP re-direct. (Note: if the client already has information on the appropriate LHS to query, the initial query to GHR is omitted)			
11	Glacier Photo collection: http://purl.org/5060D4/glacier_photos/, (a partial redirect that allows the PURL http://purl.org/5060D4/glacier_photos/{photo_id} to resolve to any glacier photo so long NSIDC maintains the practice of embedding the {photo_id} in the photo URL following the current pattern). This mechanism made it unnecessary to create PURLs for each photo in the Glacier Photo collection.				

	F	G	H	I	J
12	This appears to be XML because of the dependency of the batch processes upon submission of an XML (RELAXNG) document.				
13	The registration of a PURL is done by a given PURL Resolver.				
14	There are 2 concepts that could be used for this purpose: *sub-domains* under top-level domains (akin to a hierarchy of files), and *partial re-directs* . A partial redirect is a special-purpose PURL that acts like a domain. A regular domain has no associated URL. It is just part of a local name. While a partial redirect has a URL associated with it, that URL is not guaranteed (or even expected) to reference an actual resource. The URL associated with a partial redirect may only be a prefix common to the complete URLs of multiple resources, organized as the data creator or curator sees fit.				

	F	G	H	I	J
15	Besides the OCLC PURL Server, the most notable PURL Server is run by the Government Printing Office of the U.S.				
16	No.				
17	No.				
18	Only within the restrictions associated with the URL syntax and the added restrictions mandated by the PURL syntax for the name part of the PURL structure. Hierarchy can be imposed by use of sub-domains and partial redirects.l				

	F	G	H	I	J
19	It's possible to modifya PURL by changing the underlying location of a resource; the PURL itself should remain unchanged.				
20	No charge for PURL creation or maintenance.				
21	If the choice is made to create one DOI at a time, the only requirement is to be able to define & differentiate what is to be uniquely (and separately) identified. Batch creation of modification of PURLs would require knowledge about how to interpret an XML schema and create an instance of it in RELAX NG.				
22	Theoretically, a PURL could be used to locate any type of object accessible via the WWW.				
23					