OSU-MGR Data Discoverability

IGSN's QR Code Labelling Online Holdings & Data Portal

Robert Hatfield, Cara Fritz, Maziet Cheseby, Rupert Minnett, Anthony Koppers, Bobbi Conard, Kevin Konrad, Joe Stoner & our team of hardy, refrigerated space labelling, workers and undergrads!

Goals & Aims (Issues & Challenges)

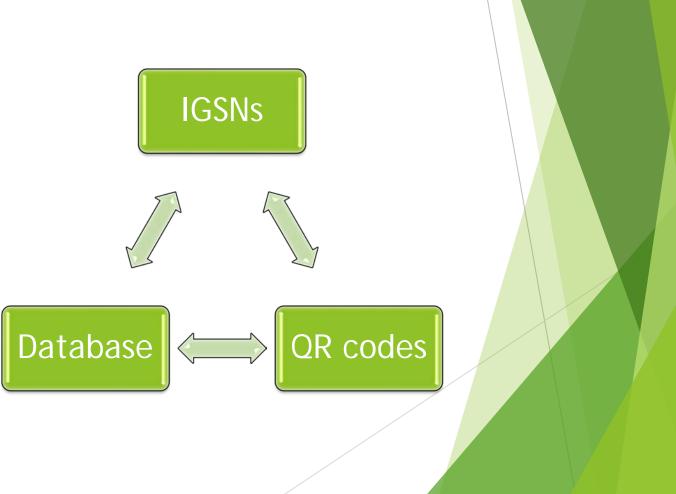
- ► To move away from a paper analog system to a digital (discoverable) collection
- Embrace the use of unique identifiers (e.g. IGSN)
- Easier access for the wider research community (extra-OSU)
- Make day to day workflow easier (controlled vocabulary, reduce errors, automization)
- > 200+ cruises: legacy data, inconsistent formats, incomplete meta data
- Diverse collection: Rocks, marine & lake sediment cores, drill cores...
- Human (intuitive) and machine readable
- Using software familiar to most users of the repository
- Information hosted online and also on the end of a d-tube!

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Three Pronged Approach

- IGSN: Unique identifier for each core section and sample
- QR codes: Sample labels encoded with sample metadata and IGSN
- Database: Contains the metadata, IGSN, and QR code and accessible through an online portal
- www.osu-mgr.org/collections/



IGSN

- Already exist SESAR
- However, potentially greater flexibility by determining our own unique identifier
- Requirements
 - Be unique!
 - Human & machine readable
 - Can intuitively link parents (cores) and daughters (samples)
 - Can be assigned offline before, during, or after collection e.g. at sea
 - ▶ Follows the IGSN syntax requirements ("A-Z", "0-9", ".", "-") and < 32 characters
- Parent IGSN: Utilize and exploit the existing Cruise-Core-Section naming scheme already used by many repositories – "IGSN Short Form"
- Daughter IGSN: Append the parent IGSN with a PI identifier and unique sample code "IGSN Long Form"

IGSN – Short Form

Parent IGSN: Utilize and exploit the existing Cruise-Core-Section naming scheme already used by many repositories

Cores

OSU-EW0408-79JC-10W

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(i)	(ii)	(iii)	(iv)	(v) (vi)	(vii) (viii)

(i)	"OSU"	Oregon State University allocating agent prefix
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- (ii) "XX[X]" Two to three letter code identifying vessel {EW = Maurice Ewing}
- (iii) "##" Last two digits of the year the coring cruise started {04 = 2004}
- (iv) "##" Two digit month the coring cruise started {08 = August}
- (v) "#[##]" One to three digit identifier of the core name or number {79 = core 79}
- (vi) "XX" Two letter code identifying the core type {JC = Jumbo Piston Core}
- (vii) "#[#]" One to two digit section number {10 = tenth core section from the top}
- (viii) "X" Core section {A = archive half; W = working half; R = whole round}

Note 1: Multicores are slightly different for (vi) because the multicore tube number follows the core type. The Multicore syntax for (vi) is "XX#" {MC3 = multicore tube number 3}.

Rocks

OSU-RR1504-D2-4A

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(i)	"OSU"	Oregon State University allocating agent prefix
(ii)	"XX[X]"	Two to three letter code identifying vessel {RR = Roger Revelle}
(iii)	"##"	Last two digits of the year the dredging cruise started {15 = 2015}
(iv)	"##"	Two digit month the dredging cruise started {04 = April}
(v)	"X"	One letter code identifying sample type {D = Dredge; G = Grap; R = ROV}
(vi)	"#[##]"	One to three digits identifying dredge number {2 = second dredge}
(vii)	"#[##]"	One to three digits denoting sample number {4 = fourth sample in D2}
(viii)	"[X]"	Optional single character denoting a subsample {A = first subsample}

IGSN – Long Form

Daughter IGSN: Append short form with a PI identifier and unique sample number

OSU-EW0408-79JC-10W.SM101

(i) (ii) (iii)
 (i) Parent IGSN IGSN short code of parent core section
 (ii) "XX" Two character PI identifier code
 (iii) "###" Up to three digits that are unique to the PI code within a core section

- PI Identifier: Constructed from the PI's initials
 - e.g. SM = Sarah Morgan
 - ▶ If Steve Marshall requested samples we use first two digits of surname "MA"
 - If not available then we use alternative surname combinations e.g. "MR", "MS", "MH", "MA", "ML" then first name combinations "ST", "SE", "SV", failing that a number, "S1", "S2" ... "S9", "S0", then a random available assignment.
- Up to three digits: Designate unique samples within the core
 - E.g. if Sarah Morgan takes 101 samples from EW0408-79JC-10W these would be called SM1, SM2 ... SM10, SM11 ... SM101 etc.
 - After 999 we replace the first digit with an alpha character e.g. A1, A2 ... ZZ9 (+2574 identifiers)
 - > After 3573 we replace the second digit with an alpha character e.g. AA1 ... AA9, AB1, AB2 ... ZZ9 (9657 unique combos)

OSU IGSN FORMAT

OSU-EW0408-79JC-10W OSU-EW0408-79JC-10W.SM101

Characteristics

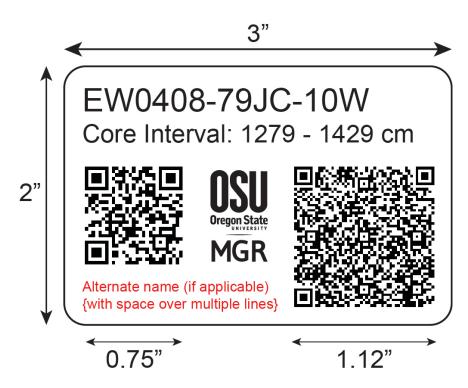
- Unique at the core section and individual sample level
- Intuitively readable
 - Core section (short form) differentiated from individual sample (long form)
- Follows IGSN syntax requirements
 - Longest short IGSN 22 characters
 - Average short IGSN 18 characters
 - Long IGSN plus 4-6 characters
 - Long 28, Av. 24

Additional Advantages

- Can be seamlessly assigned "offline" at sea during normal curation process
- Short IGSNs can be used (and historically have been used) as identifiers to track cores in the repository
 - Database
 - QR codes

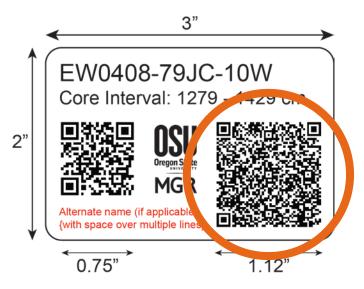
QR Codes

OSU-MGR label applied to d-tube, end cap, and core liner



- Cruise-Core-Section Name
- Core interval (cm)
- Data Link (left QR)
- Metadata (right QR)
- Space for alternate core name

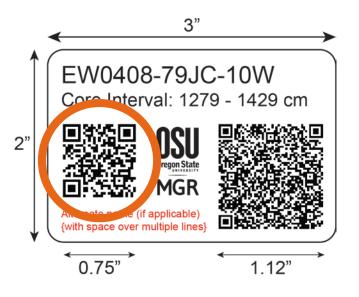
Meta Data Link (static information)





- ► IGSN: OSU-EW0408-79JC-10W
- Lat: 59.5357
- ▶ Long: -141.7609
- ▶ Water Depth: 158m
- ► Total Sections in Core: 12
- ► Total Length: 1724cm
- Section Length: 150cm
- ► Top: 1279cm
- ▶ Bottom: 1429cm
- ► PI: Alan Mix

Data Link (non-static information)





http://osu-mgr.org/OSU-EW0408-79JC-10W

IGSN: OSU-EW0408-79JC-10W



IGSN: OSU-EW0408-79JC-10W Material: Marine Sediment Core Type: Section Working Half

Parent Core:

Material:	Marine Sediment Core
Core Name:	EW0408-79JC
Core Type:	Jumbo Piston Core
Core Length:	1724 cm
Total Sections:	12
Latitude:	59.5357°
Longitude:	- 141.7609°
Water Depth:	158 m
Research Vessel:	Maurice Ewing
Date of Collection:	2004-09-15
Cruise PI:	Alan Mix
Cruise PI Institution:	Oregon State University
Cruise PI Email:	amix@coas.oregonstate.edu
Alt. Cruise Name:	
Alt. Core Name:	
Location:	OSU Marine Geology Repository: (93.1.3.2)
Location Contact:	corelab@coas.oregonstate.edu

Section Info:

Section: 10 Section Half: Working Section Interval: 1279 - 1429 cm Notes:

Data Available:

Coring Data Sheet:	http://osu-mgr.org/OSU-EW0408-79JC-10W/CoringDatasheet
Core Description:	http://osu-mgr.org/OSU-EW0408-79JC-10W/CoreDescription
Line Scan Image:	http://osu-mgr.org/OSU-EW0408-79JC-10W/Image
MST Data:	http://osu-mgr.org/OSU-EW0408-79JC-10W/MSTData
XRF Data:	
CT Scan Data:	
Link to NGDC:	http://www.ngdc.noaa.gov/geosamples/cruise.jsp?cru=EW0408&inst=OSU&shp=Maurice%20Ewing
Link to Publications:	http://osu-mgr.org/OSU-EW0408-79JC-10W/Publications

URL served information

IGSN: OSU-EW0408-79JC-10W



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Core Description:	http://osu-mgr.org/OSU-EW0408-79JC-10W/CoreDescription
Line Scan Image:	http://osu-mgr.org/OSU-EW0408-79JC-10W/Image
MST Data:	http://osu-mgr.org/OSU-EW0408-79JC-10W/MSTData
XRF Data:	
CT Scan Data:	
Link to NGDC:	http://www.ngdc.noaa.gov/geosamples/cruise.jsp?cru=EW0408&inst=OSU&shp=Maurice%20Ewing
Link to Publications:	http://osu-mgr.org/OSU-EW0408-79JC-10W/Publications

Additional Info

- Material: e.g. Core, Dredge, ROV, Grab sample
- Core Type
- Research Vessel
- Date of Collection
- PI contact info
- (Alternate name/info optional)
- Location in repository (Rack 93, Row, 1, Space 3, Position 2)

Data Available:

- Coring data sheet (pdf)
- Core description (pdf)
- Line scan image (jpg/bmp/tiff)
- MST data (txt)
- Link to IMLGS (link)
- Link to publications (link)

http://osu-mgr.org/OSU-EW0408-79JC-10W

Architecture: Server Organization

Core Description: http://osu-mgr.org/OS Line Scan Image: http://osu-mgr.org/OS MST Data: http://osu-mgr.org/OS XRF Data: CT Scan Data: Link to NGDC: http://www.ngdc.noad	SU-EW0408-79JC-10W/CoringDatash SU-EW0408-79JC-10W/CoreDescripti SU-EW0408-79JC-10W/Image SU-EW0408-79JC-10W/MSTData a.gov/geosamples/cruise.jsp?cru=EW SU-EW0408-79JC-10W/Publications		 Data Access URL - IGS Multitud .pdf
Core Lab (\\haviside) (Y:) Core Lab (\\haviside) (Y:) Collection Labelling & Database Samples Southtown Building Plans Colls Guides & Instructions Website	 ✓ ✓y Search Marine Co Wew Template EW9504 EW9505 HLY0602 ME0005A 	Organize Burn New folder Image: Second Control of	 Search EW0408 Search EW0408 Search EW0408 Search EW0408 Core Description Coring Data Sheet CT-Scans IGSN Sheets Line Scan Images Miscellaneous MST Data NGDC Upload Publications Samples Taken XRF Data EW0408 Meta Data W III

ibility

- N Data Type
- of data types
 - .jpeg, .tiff, .txt, .bmp etc
 - Core Description .ai and .pdf of samples taken
 - Coring Data Sheet pdf of original coring data sheet
 - CT-Scans .dicom and .jpeg/.tiff files if available
 - IGSN Sheets IGSN Output Sheet
 - Line Scan Images bmp/jpeg/tiff files if available
 - Miscellaneous anything else/other notes
 - MST Data MST calibration, raw, and output (calibrated) files
 - NDGC Upload data file uploaded to IMLGS
 - Publications pdfs of publications resulting from the cores
 - Samples Taken list of samples taken from the cores
 - XRF Data text file detailing measurements made
 - EW0408 Meta Data excel file containing section meta data

Database: Metadata & Samples Distributed

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SU-EW0408-79JC-3W	OK!	EW0408		ce Ewing	79	Marine Sediment Core	Jumbo Pisto	n Core 200	04-09-15	15:59	59.5357	-141.760	9	158 N	151	N	1alispina shelf/slo		
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SU-EW0408-79JC-5A	OK!	EW0408		ce Ewing		Marine Sediment Core				15:59	59.5357	-141.760		158 N			talispina shelf/slo		
SU-EW0408-79JC-5W	OK!	EW0408		ce Ewing		Marine Sediment Core				15:59	59.5357	-141.760		158 N			lalispina shelf/slo		
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SU-EW0408-79JC-9W	OK!	A	В	С	D	G	н		К	L	M	N	0	U	V	W	Z	AJ	
SU-EW0408-79JC-10A	OK!						▼ Cruise					V Co	re						
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SU-EW0408-79JC-11W		13539 Complete	3/23/2017	3/27/201	7 2017-004	OSU-RR0603-3PC-1W.1	O6 RR0603	Marine Se	ediment Co	re PC (Piston Co	ore) 3	1 W - W	/orking	30	32	10	Tominaga, Masako	Isotopes - 230Th	Bulk S
5U-EW0408-79JC-12A	OK!	13540 Complete	3/23/2017	3/27/201	7 2017-004	OSU-RR0603-3PC-1W.1	O7 RR0603	Marine Se	ediment Co	re PC (Piston Co	ore) 3	1 W - W	/orking	36	38	10	Tominaga, Masako	Isotopes - 230Th	Bulk S
	OK!	13541 Complete	3/23/2017	3/27/201	7 2017-004	OSU-RR0603-3PC-1W.1	O8 RR0603	Marine Se	diment Co	re PC (Piston Co	ore) 3	1 W - W	/orking	40	42	10	Tominaga, Masako	Isotopes - 230Th	Bulk S
SU-EW0408-81MC1-1A	OK!	13542 Complete	3/23/2017	3/27/201	7 2017-004	OSU-RR0603-3PC-2W.1	O1 RR0603			re PC (Piston Co		2 W - W	/orking	45	47	10	Tominaga, Masako	Isotopes - 230Th	Bulk S
SU-EW0408-81MC1-1W	OK!	13543 Complete	3/23/2017	3/27/201	7 2017-004	OSU-RR0603-3PC-2W.1	O2 RR0603	Marine Se	diment Co	re PC (Piston Co	ore) 3	2 W - V	/orking	50	52	10	Tominaga, Masako	Isotopes - 230Th	Bulk S
5U-EW0408-81MC2-1A	OK!	13544 Complete	3/23/2017	3/27/201	7 2017-004	OSU-RR0603-3PC-2W.1	O3 RR0603	Marine Se	ediment Co	re PC (Piston Co	ore) 3	2 W - V	/orking	54	56	10	Tominaga, Masako	Isotopes - 230Th	Bulk S
	OK!	13545 Complete	3/23/2017	3/27/201	7 2017-004	OSU-RR0603-3PC-2W.1	O4 RR0603	Marine Se	diment Co	re PC (Piston Co	ore) 3	2 W - V	/orking	60	62	10	Tominaga, Masako	Isotopes - 230Th	Bulk S
		13546 Complete						Marine Se	diment Co	re PC (Piston Co	ore) 4	1 W - V		5	7	10	Tominaga, Masako	Isotopes - 230Th	Bulk S
SU-EW0408-81MC3-1W		13547 Complete		3/27/201	7 2017-004	OSU-RR0603-4PC-1W.1	TO2 RR0603	Marine Se	ediment Co	re PC (Piston Co	ore) 4	1 W - V		10	12	10	Tominaga, Masako	Isotopes - 230Th	Bulk S
GU-EW0408-81MC4-1A GU-EW0408-81MC4-1W	OK!	13548 Complete				OSU-RR0603-4PC-1W.1				re PC (Piston Co		1 W - V		15	17	10	Tominaga, Masako		
SU-EW0408-81MC5-1A	OK!	13549 Complete				OSU-RR0603-4PC-1W.1				re PC (Piston Co		1 W - V		20	22	10	Tominaga, Masako		
	OK!	13550 Complete				OSU-RR0603-4PC-1W.				re PC (Piston Co		1 W - V		25	27	10	Tominaga, Masako		
U-EW0408-81MC6-1A	OK!	13551 Complete				OSU-RR0603-4PC-2W.1				re PC (Piston Co		2 W - V		31	33	10	Tominaga, Masako		
SU-EW0408-81MC6-1W	OVI	13552 Complete				OSU-RR0603-4PC-2W.1				re PC (Piston Co		2 W - W		35	37	10	Tominaga, Masako		
11 EMICADO 018407 1A	OKI	13553 Complete								re PC (Piston Co		2 W - W		40	42 47	10	Tominaga, Masako		
Master Sheet	+	13554 Complete 13555 Complete				OSU-RR0603-4PC-2W.1 OSU-RR0603-4PC-2W.1				re PC (Piston Co re PC (Piston Co		2 W - W 2 W - W	-	45 50	47 52	10	Tominaga, Masako Tominaga, Masako		
· 🔚		13555 Complete 13556 Complete				OSU-RR0603-4PC-2W.				re PC (Piston Co re PC (Piston Co		2 W - V 2 W - V		50	52	10	Tominaga, Masako		
		13557 Complete				OSU-RR0603-4PC-2W.				re PC (Piston Co re PC (Piston Co		2 W - W		60	62	10	Tominaga, Masako		
		13558 Complete			7 2017-004	OSU-RR0603-5PC-1W.1				re PC (Piston Co		1 W - W	-	5	7	10	Tominaga, Masako		
		13559 Complete	3/23/2017		7 2017-004	OSU-RR0603-5PC-1W.1				re PC (Piston Co		1 W - W		10	12	10	Tominaga, Masako		
		13560 Complete				OSU-RR0603-5PC-1W.1				re PC (Piston Co		1 W - W		15	17	10	Tominaga, Masako		
		13561 Complete				OSU-RR0603-5PC-1W.1				re PC (Piston Co		1 W - W		20	22	10	Tominaga, Masako		
		13562 Complete				OSU-RR0603-5PC-1W.				re PC (Piston Co		1 W - V		25	27	10	Tominaga, Masako		
		13563 Complete		3/27/201	7 2017-004	OSU-RR0603-5PC-1W.1	O6 RR0603			re PC (Piston Co		1 W - W		30	32	10	Tominaga, Masako		
		13564 Complete	3/23/2017	3/27/201	7 2017-004	OSU-RR0603-5PC-1W.1	O7 RR0603	Marine Se	ediment Co	re PC (Piston Co	ore) 5	1 W - V	/orking	35	37	10	Tominaga, Masako	Isotopes - 230Th	Bulk S
		13565 Complete	3/23/2017	3/27/201	7 2017-004	OSU-RR0603-5PC-1W.1	O8 RR0603	Marine Se	ediment Co	re PC (Piston Co		1 W - V	/orking	40	42	10	Tominaga, Masako	Isotopes - 230Th	Bulk S
		13566 Complete	3/23/2017			OSU-RR0603-5PC-1W.	O9 RR0603	Marine Se	ediment Co	re PC (Piston Co		1 W - W	_	45	47	10	Tominaga, Masako		
		13567 Complete								re PC (Piston Co		1 W - V		50	52	10	Tominaga, Masako		
		13568 Complete				OSU-RR0603-5PC-1W.				re PC (Piston Co		1 W - V		55	57	10	Tominaga, Masako		
		13569 Complete	3/23/2017	3/27/201	7 2017-004	OSU-RR0603-5PC-2W.1	TO1 RR0603	Marine Se	ediment Co	re PC (Piston Co	ore) 5	2 W - V	/orking	60	62	10	Tominaga, Masako	Isotopes - 230Th	Bulk S
		a de del	Scientist (PI)		wn Boxes	Input Sheet M		(+)											

User friendly Excel based database

? 🗈 – 🗗 🗙

+ 809

- Controlled vocabulary
 - Drop down selection boxes constrain available options
 - Makes for more efficient searching and less errors
- VBA coded to provide automatic error checking and automatically writes URLs for 'available information'

Case Study: KM1609 Cruise of the Kilo Moana to Tuvalu, September 2016

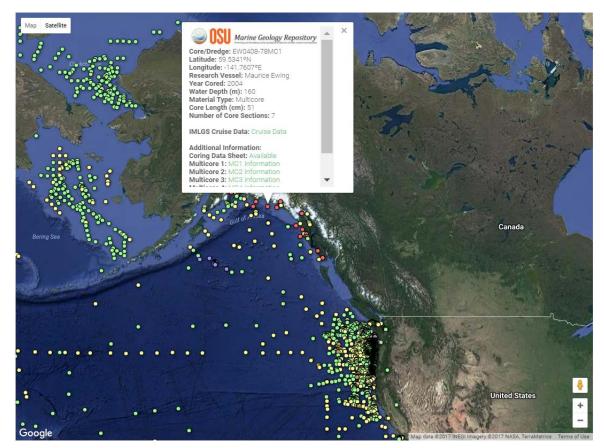




- Toughbook
- Zebra Labeling software & printer
- Excel Spreadsheet
- Offline mirror of file structure that can be copied over to our main server on return from sea
- 349 samples recovered
- 439 IGSNs assigned offline at sea
 - Individual rocks (e.g. OSU-KM1609-D4-11A)
 - Personal Subsamples (e.g. OSU-KM1609-D4-11A.AK1)

Website Integration

- Information is geocoded using Google Fusion Tables and visualized on a Google map on our website
- http://www.osu-mgr.org/collections



- Data discoverable through online map interface
- Searchable by core type
- Ability to access:
 - NDGC/IMLGS data
 - Coring data sheets
 - Core descriptions
 - Images
 - MST data
 - Publications
 - XRF data
 - ► Etc....

Website provides main external access to the collection

Progress/Summary ~24,000 IGSNs assigned & >31,000 labels printed!

- 10425 short IGSNs assigned
- 52 % of entire collection labeled
- Cruises completed back to 1980
- Targeting Fall 2017 for digitization of entire legacy collection
- 13568 long IGSNs assigned
- Long IGSNs (internally) assigned to every sample since 2014
 - Not yet routinely served to PIs
- Aim to routinely provide IGSNs for every sample distributed from the OSU-MGR

