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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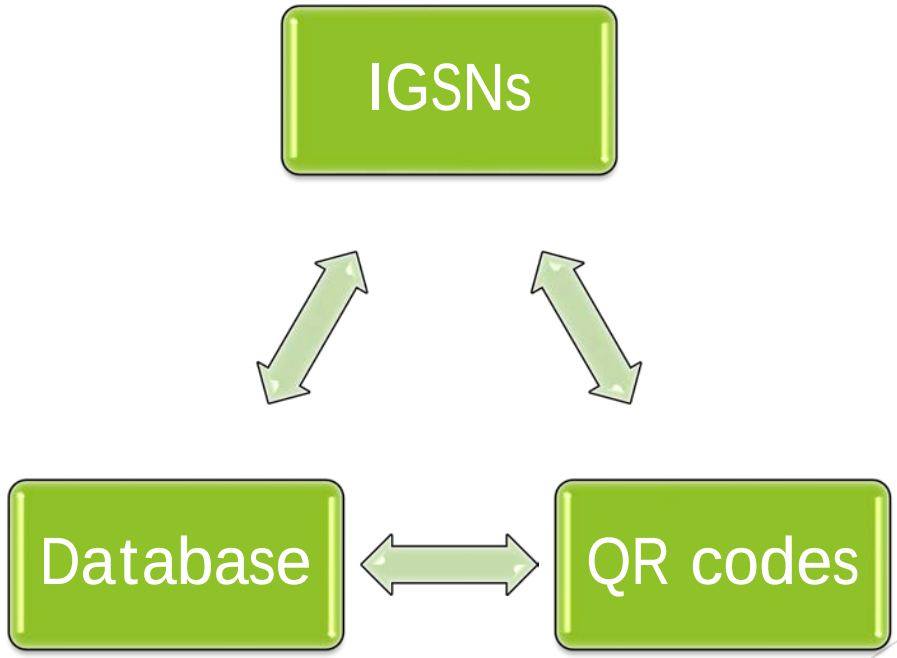
Three Pronged Approach

- **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

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

(i)	"OSU"	Oregon State University allocating agent prefix
(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}

Rocks

OSU-RR1504-D2-4A

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

(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}

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}.

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** = **S**arah **M**organ
  - 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

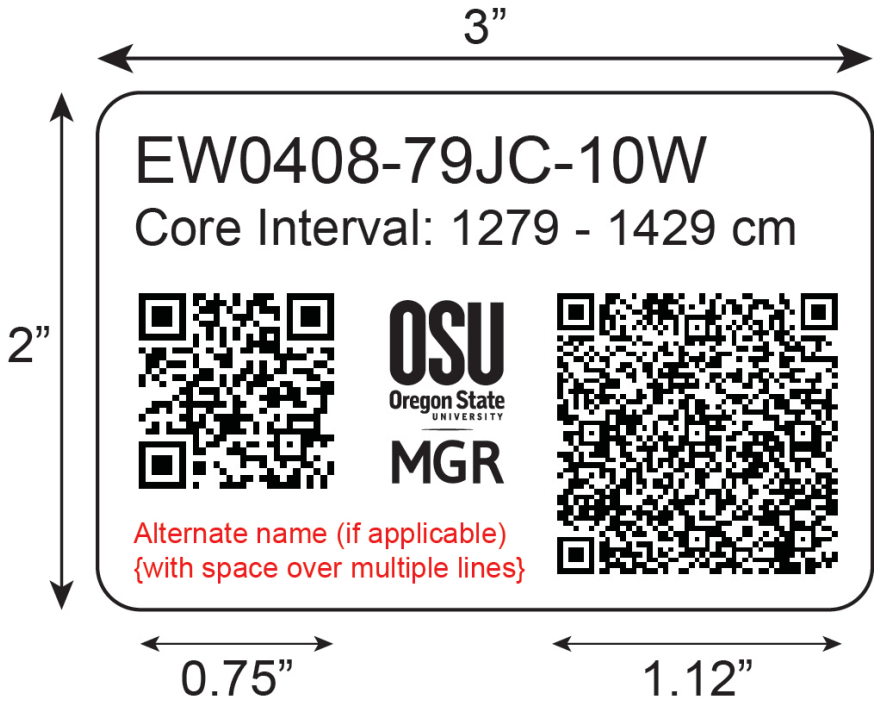
- Unique at the core section and individual sample level
- Intuitively readable
  - Core section (short form) differentiated from individual sample (long form)
- Follows IGSN syntax requirements
  - Longest short IGSN – 22 characters
  - Average short IGSN – 18 characters
  - Long IGSN plus 4-6 characters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

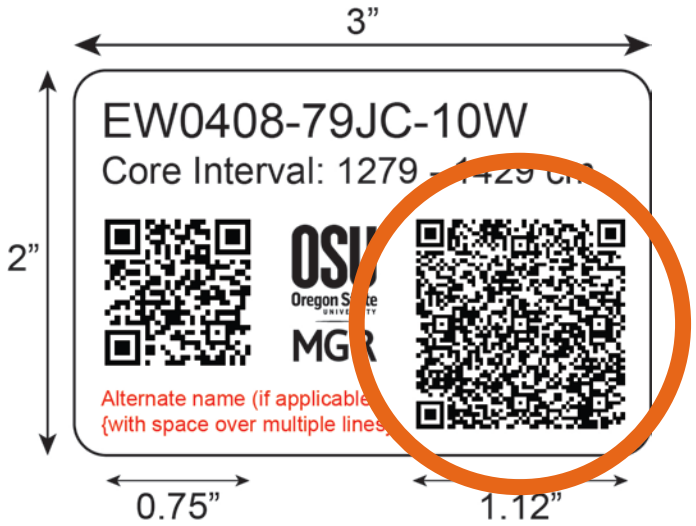
QR Codes

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



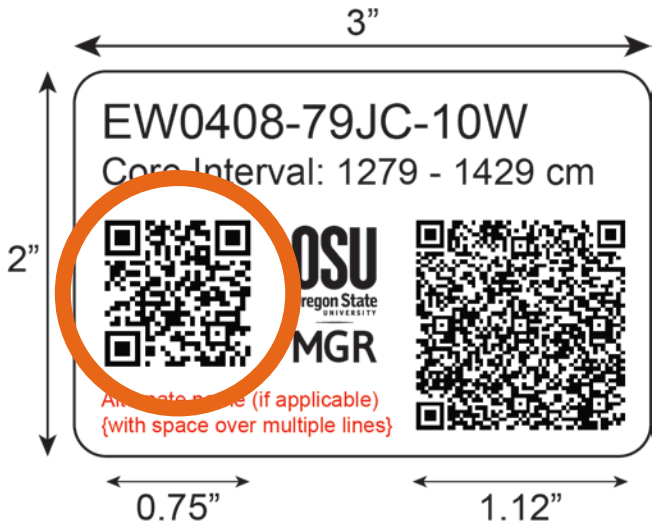
- Cruise-Core-Section Name
- Core interval (cm)
- Data Link (left QR)
- Metadata (right QR)
- Space for alternate core name

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

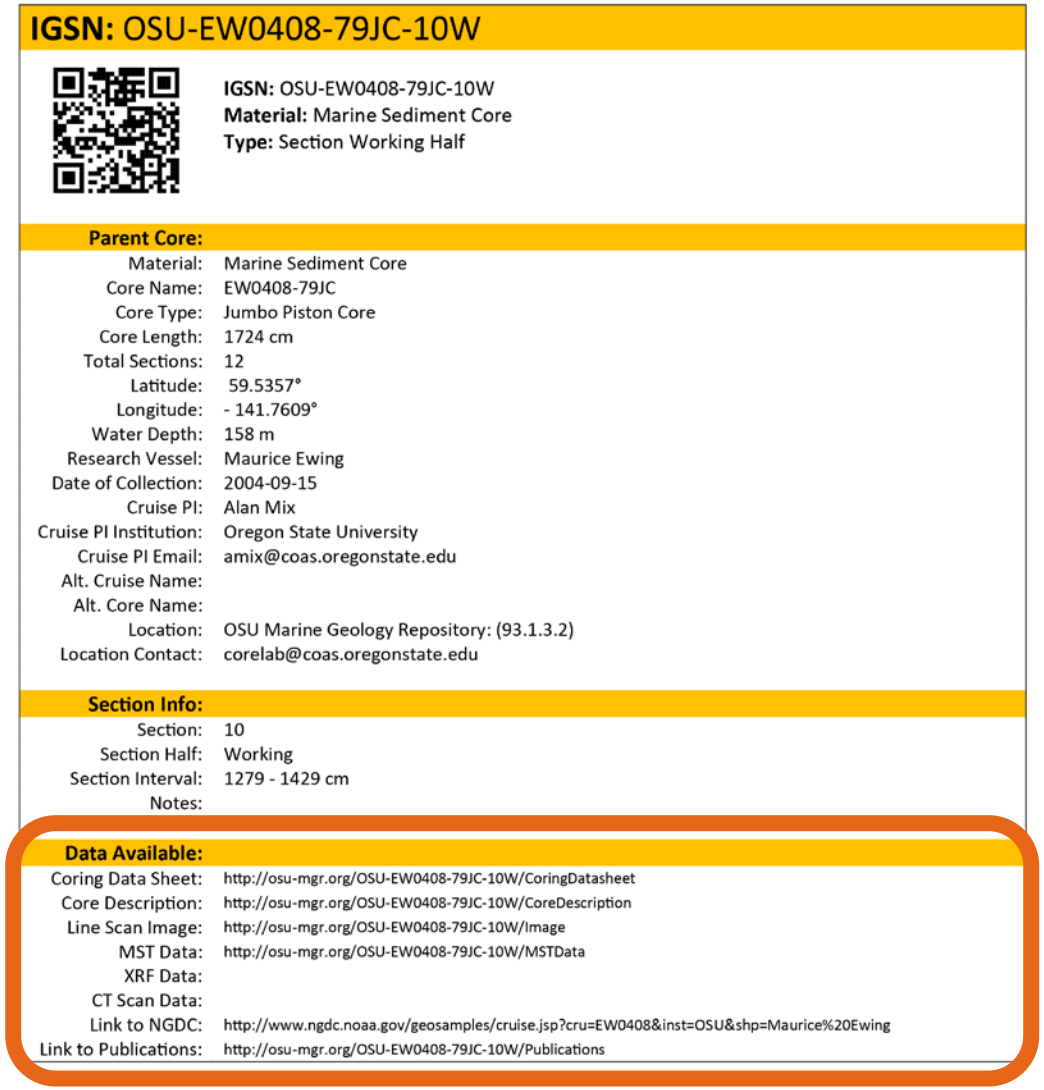
IGSN: OSU-EW0408-79JC-10W
Material: Marine Sediment Core
Type: Section Working Half

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



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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

- **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

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
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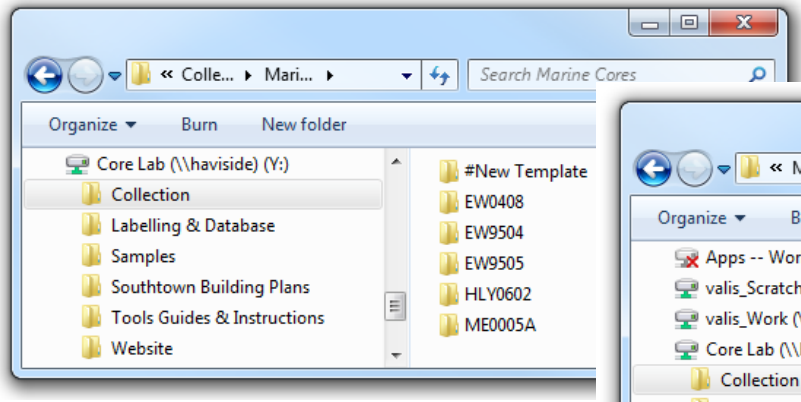
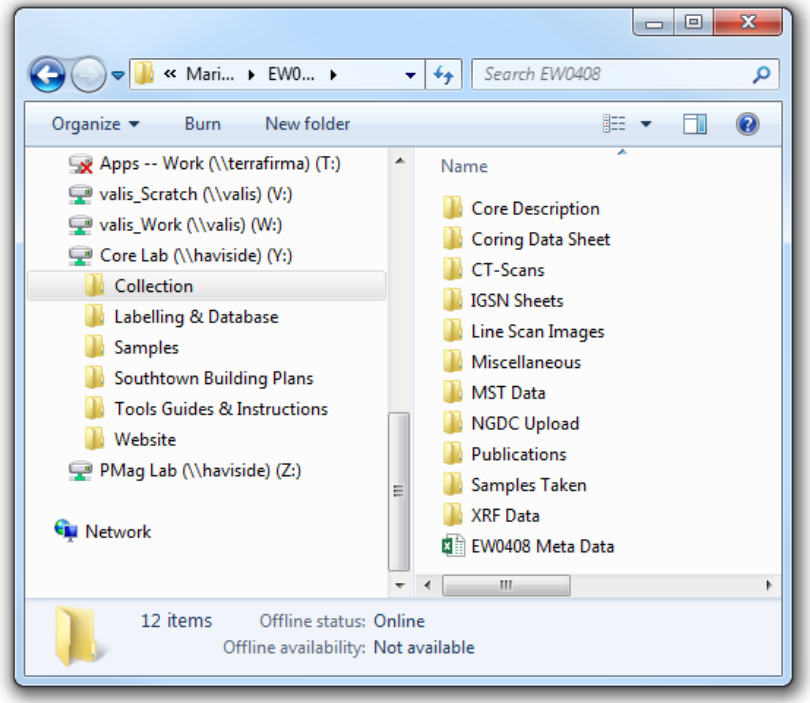
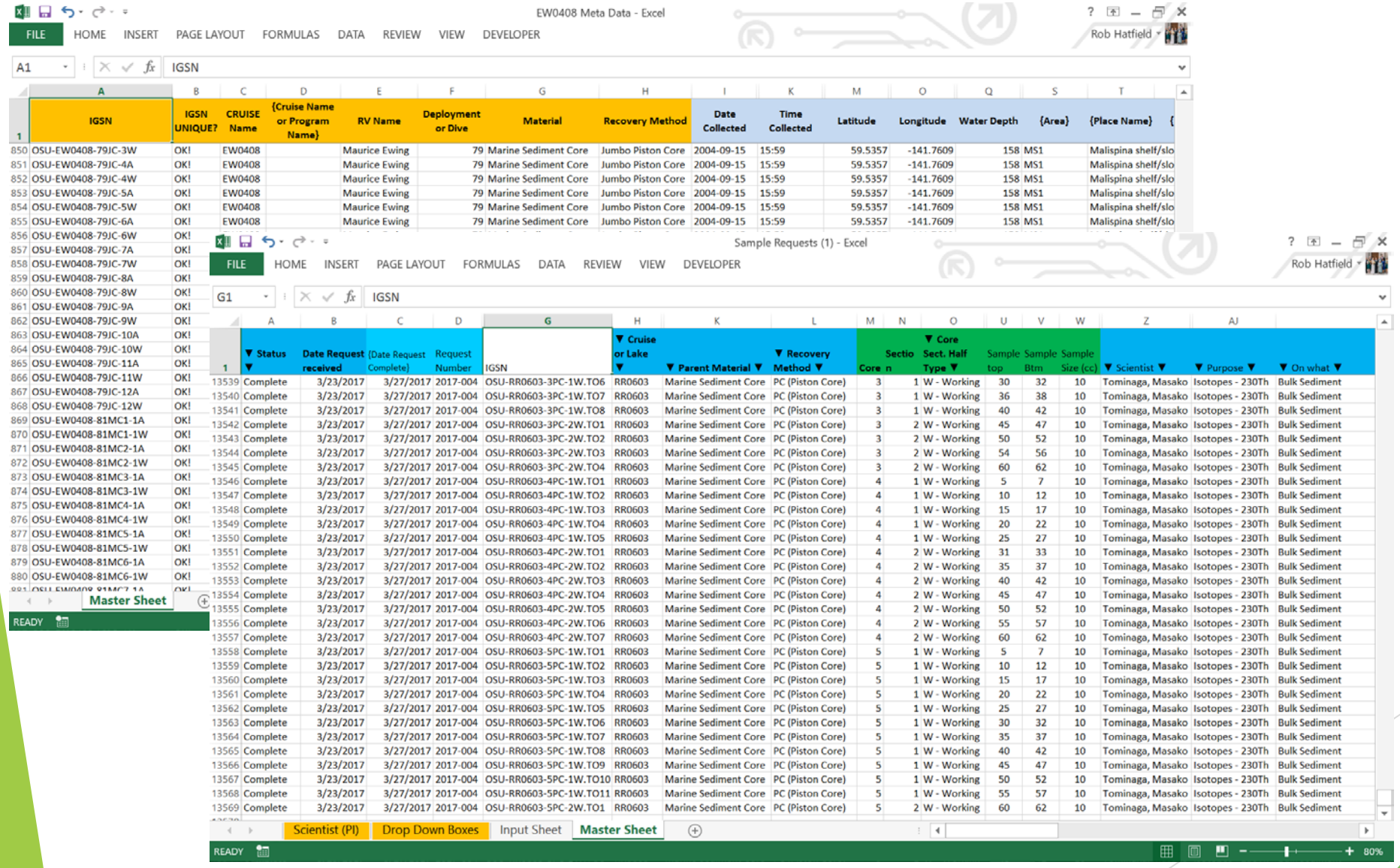
- **Data Accessibility**
  - URL – IGSN – Data Type
  - Multitude of data types
    - .pdf, .jpeg, .tiff, .txt, .bmp etc





- **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



- User friendly Excel based database
- 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

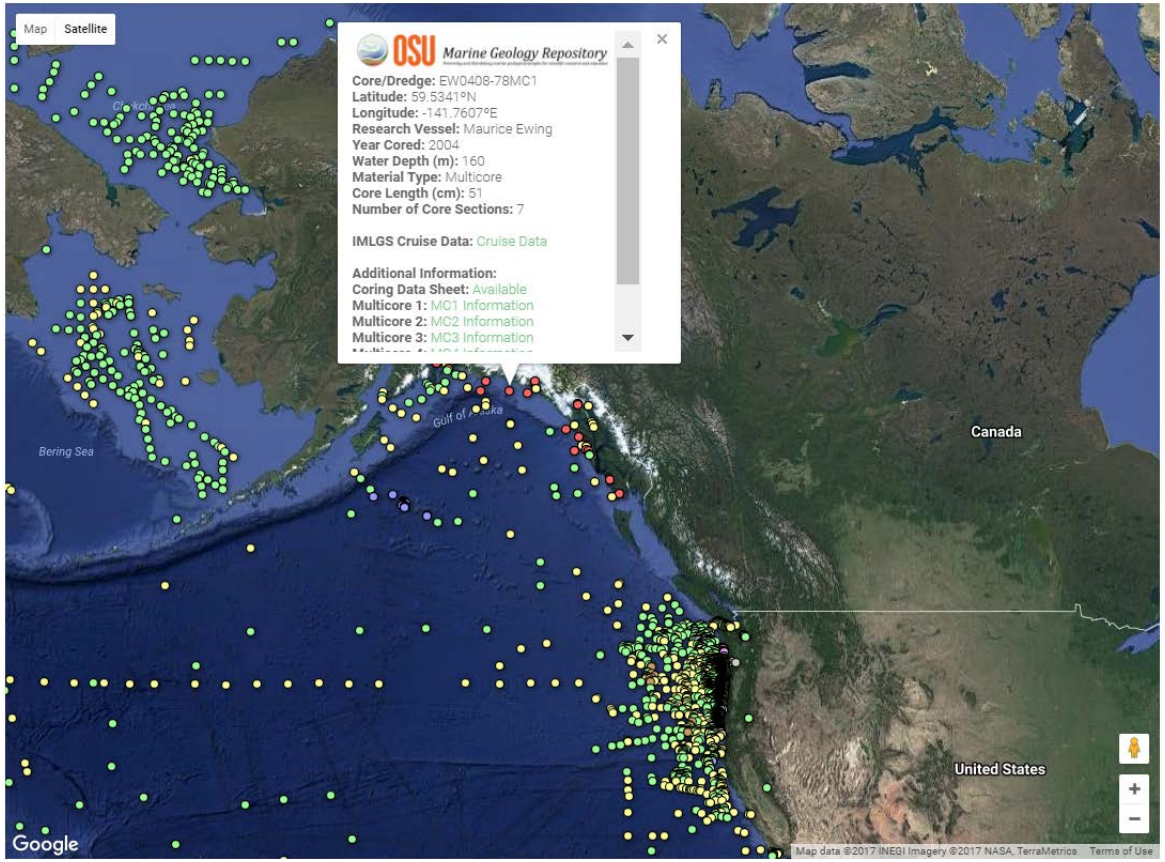
- Toughbook
- Zebra Labeling software & printer
- Excel Spreadsheet

- 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