Physical Collections: How to Create a Valuable National Resource

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U.S. Department of the Interior
U.S. Geological Survey

USGS Geology Discipline

- Mineral Resources Program
  - National Geochemical Archive
    - Samples from 1940's
    - Large additions
      - 1970 – 80's
      - 60,000 samples per year
    - Currently 3,000,000 samples in archival storage
- Core Research Center

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Core Research Center (CRC)

- Established in 1974
- Goal:
  - ✓ Rescue valuable cores threatened with disposal or destruction
  - ✓ Make cores available to scientists and educators from Government, industry, and academia
- Currently:
  - ✓ 1,500 visitors yearly
  - ✓ Located in Bldg. 810 at Denver Federal Center

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Core Research Center

What we have . . .

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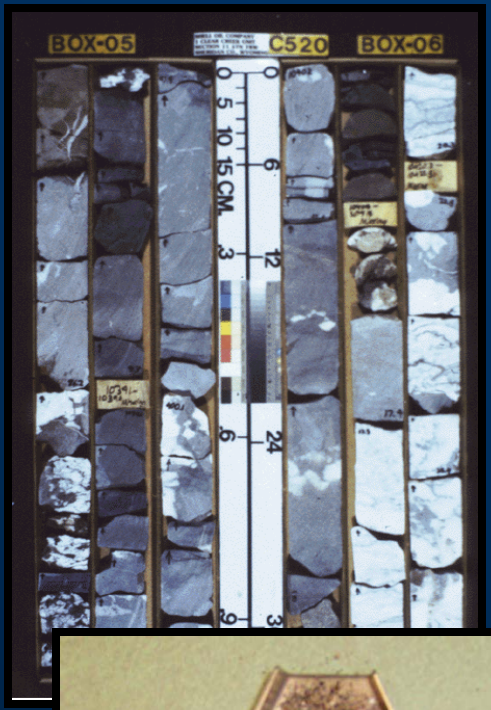
Physical Collections

- Cores
  - ✓ Archived (Slabbed)
  - ✓ Unprocessed
- Well Cuttings
- Thin Sections
- Photos
- Analytical Data
- Fossils



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Core Research Center

What we have done to create valuable national resource. . .

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Core Collection

- 1.7 million feet of core from 9,000 wells in 35 states
- Archived cores
- Uprocessed cores
- Most from Rocky Mountain Region
- Majority drilled for oil/gas exploration and donated by private companies
- Collection includes some mining cores
- Small percentage drilled by USGS for special scientific purposes

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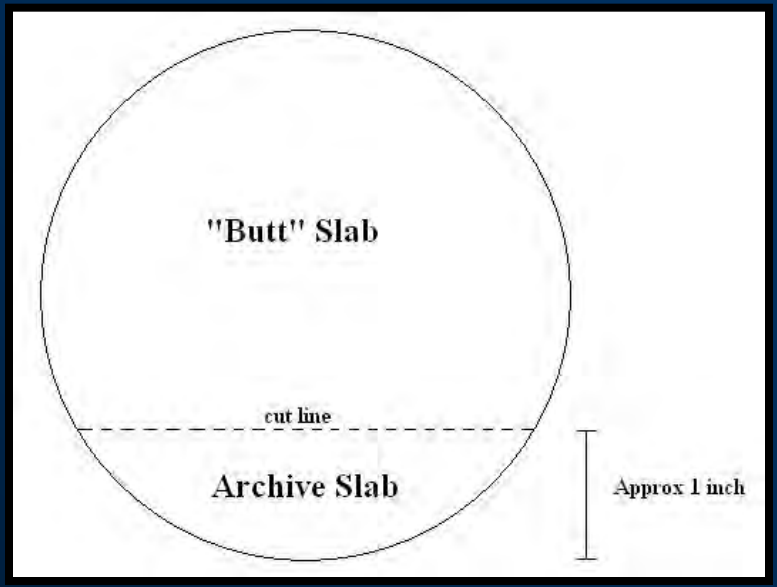
Archived Cores

- Slabbed
  - Cut the core into two sets
  - Clean, flat surface reveals details in the rock
  - Photographed
  - Reboxed into standard size archive box to be shelved
- Standard archive core box holds 10-15 feet of core



Core Slabbing Diagram

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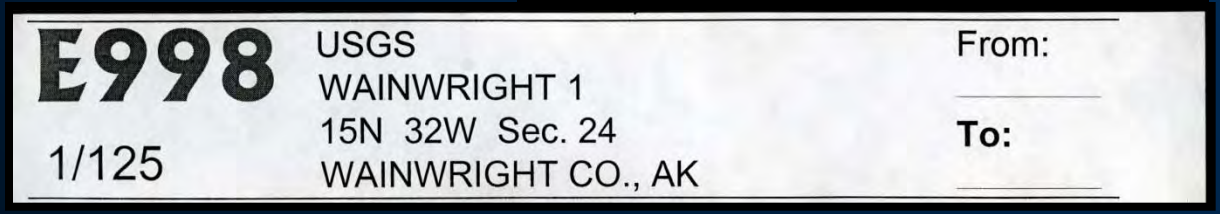
Archived Cores

- 40,000 archive boxes containing over 400,000 feet of core from 4,500 different wells
- Stored like books in a library allows easy access for one box or many
- Reduces storage space
- Allows for fast and easy retrieval of specific core intervals.
- Ordered alphanumerically on the shelves by library number



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Unprocessed Cores

- Same condition as received
  - ✓ Full diameter cores
  - ✓ Split cores
  - ✓ Thick slab (butt) sets
  - ✓ Thin slab
  - ✓ Core chips
  - ✓ Unreboxed archived slabs
- All sizes and shapes of boxes

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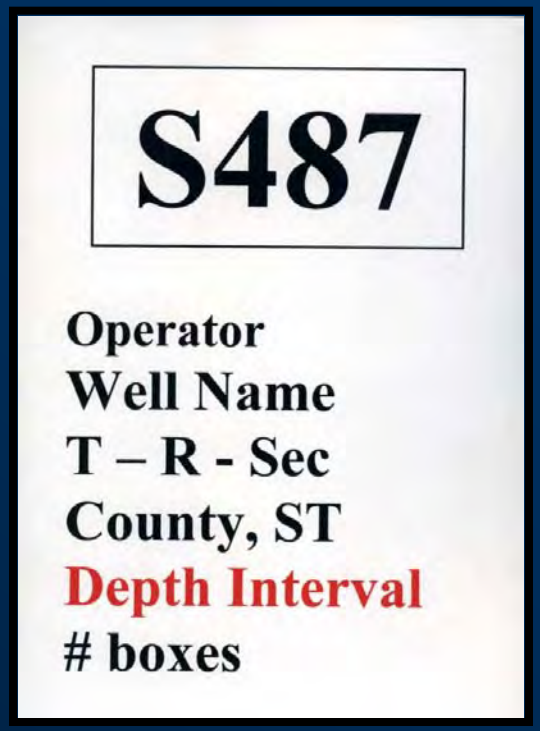
Unprocessed Cores

- Stored on pallets in CRC warehouse.



- Each pallet affixed with one identifier card per well. Includes library number, operator, name, location, depth interval and number of boxes.

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Unprocessed cores

- **Stored in the CRC warehouse based on their classification**
  - Oil/gas exploration
  - Oil shale
  - Coal
  - Uranium/Thorium
  - Mining
  - USGS Hold
  - Special Collections
  - Bureau of Mines
  - Butt sections

Well Cuttings

- Cuttings from over 54,000 holes from 27 states, representing over 240 million feet of drilling
- Cuttings stored in paper envelopes marked with depth
- Envelopes kept in cardboard boxes
- Variety of sizes and shapes of boxes

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Well Cuttings

- 135,000 boxes stored on 1,785 feet of shelving 16 feet high
- Boxes placed on shelving in order of library number

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Well Cuttings

- Library number – two letters followed by five numbers
- Front of each box contains library number, operator, well name, location, depth interval, and box number

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Use of tools - forklifts

- To maximize the available storage space, the CRC utilizes two unique types of forklifts:

Drexel

Raymond

USGS

Drexel Side-Loading Forklift

- Allows the CRC to reduce width of aisles between sets of pallet racking from 12 feet required for standard forklifts to only 7 feet.
- Footprint of the pallet storage area reduced by 60% or increased by 40%.

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Electric Order Picker

- Allows the CRC to increase the maximum height of shelving used to store boxes of archived cores and drill cuttings.
- Raymond order picker enables the CRC staff to have quick and convenient access to these collections.

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Data Repository

- Thin Sections
- Photos
- Analytical data
- Well Catalog

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Thin Sections

- Over 18,000 thin sections
- Stored in metal or paper holders in drawers
- Petrographic microscopes available for viewing and photographing thin sections
- Images available at CRC website
- Thin sections may be checked out for 30 days

Thin section of Entrada sandstone formation taken from core A950, at a depth of 5,941 feet

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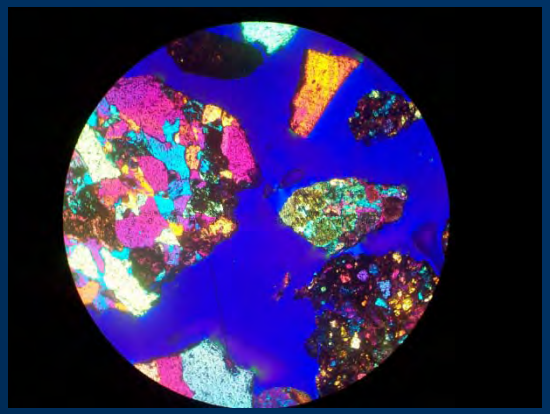
Photographs

- Over 6,000 core photos available at the CRC website
- Clean surfaces of cores are photographed when pulled for customers
- Photos are associated with cores and available online
- Thin section photos or scanned images



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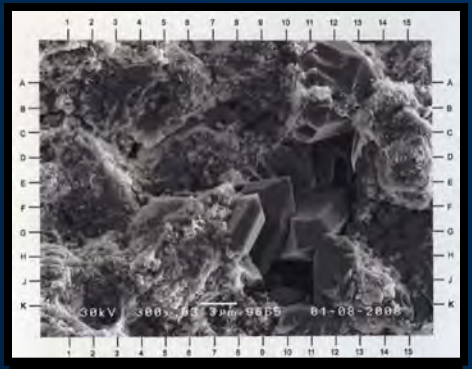
Analytical Data

File cabinets in CRC Data Room

- Sampling of core or cuttings is permitted
- Analytical results must be submitted to the CRC, digital preferred
- Over 7,000 files
- Data is available to all
- Most analog data files scanned
- Digital data available online



SEM microphotograph

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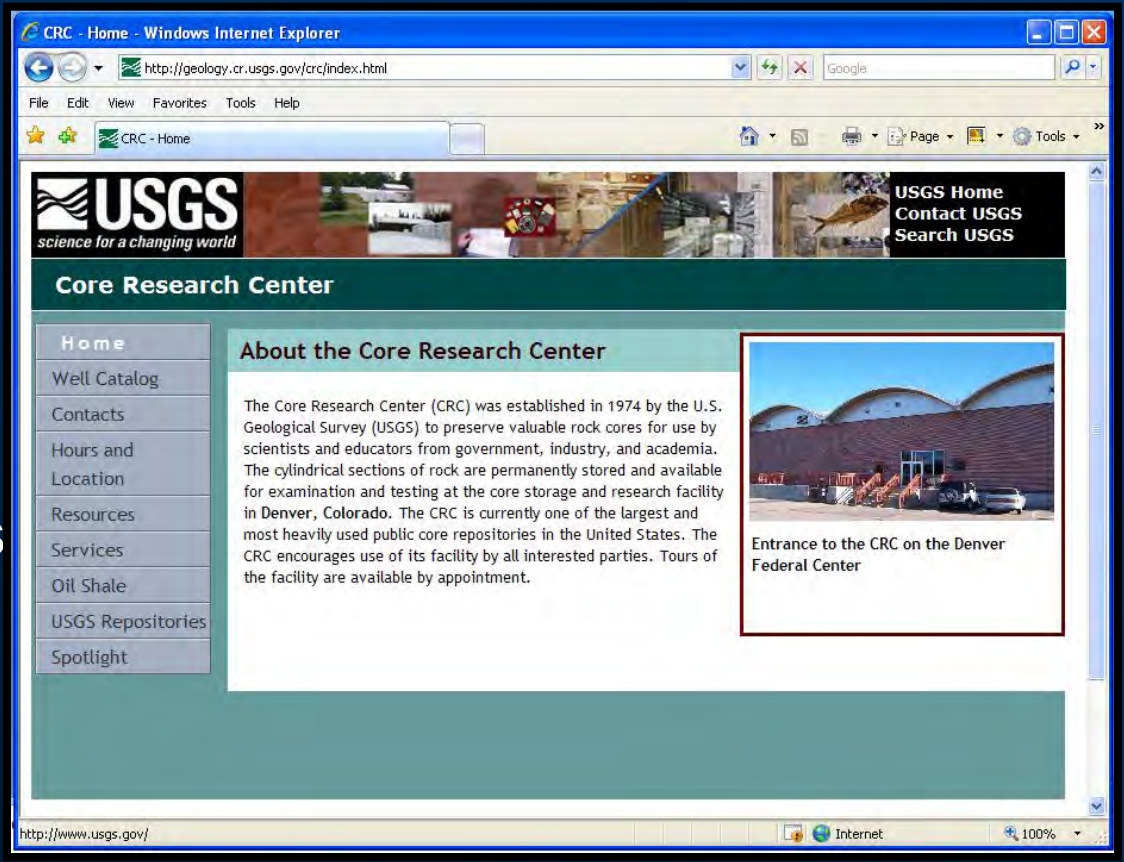
Public Well Catalog

- Searchable well catalog available at the CRC website
- Catalog contains well information (operator, name, location, depth interval, etc.) along with analysis and thin section images



Internal Database

- Card catalog, in addition to an internal access digital database, for use by the CRC staff only.
- Changes to the internal database are reflected in the public well catalog.

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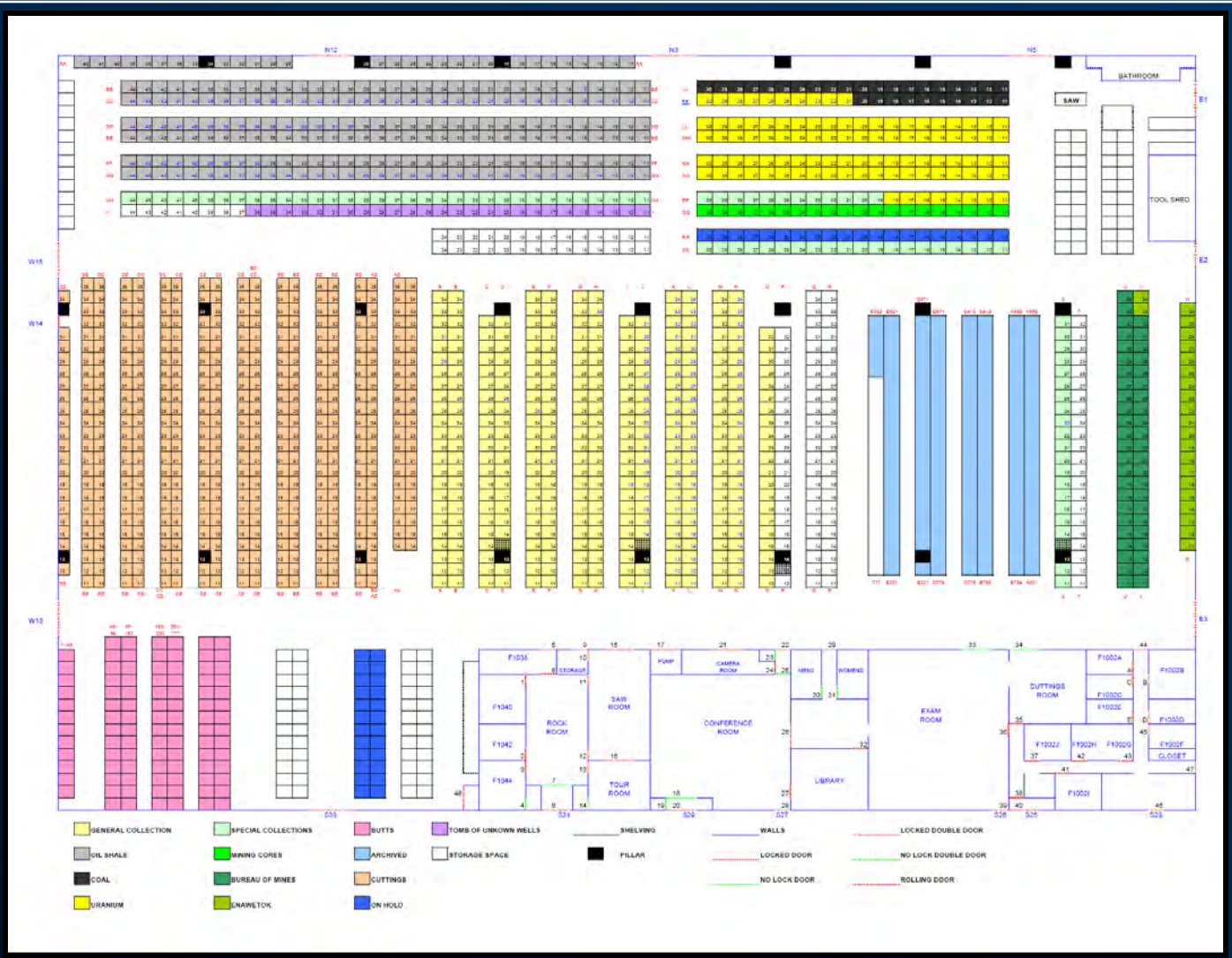
CRC Warehouse Map



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In summary:

- What do you have?
- Why do you have it?
- What is your end goal?

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In summary (cont'd):

- Documentation
  - Labeling
    - Processed
    - Unprocessed
  - Forms
- Uniformity
  - Boxes
  - Pallet sizes

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In summary (cont'd):

- Organization
  - ✓ Where stored
    - In warehouse
    - On pallet racking
  - ✓ How it is stored
    - Like books
    - Alphanumerically
  - ✓ What it is stored in
    - Boxes
    - File cabinets
    - Library card catalogs

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In summary (cont'd):

- Use of tools
  - ✓ Drexel forklift
  - ✓ Raymond forklift
- What is available to user?
  - ✓ Thin sections
  - ✓ Photographs
  - ✓ Data
- Format of info available to user
  - Analog
  - Digital
  - On-line

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- What do you have?
- Why do you have it?
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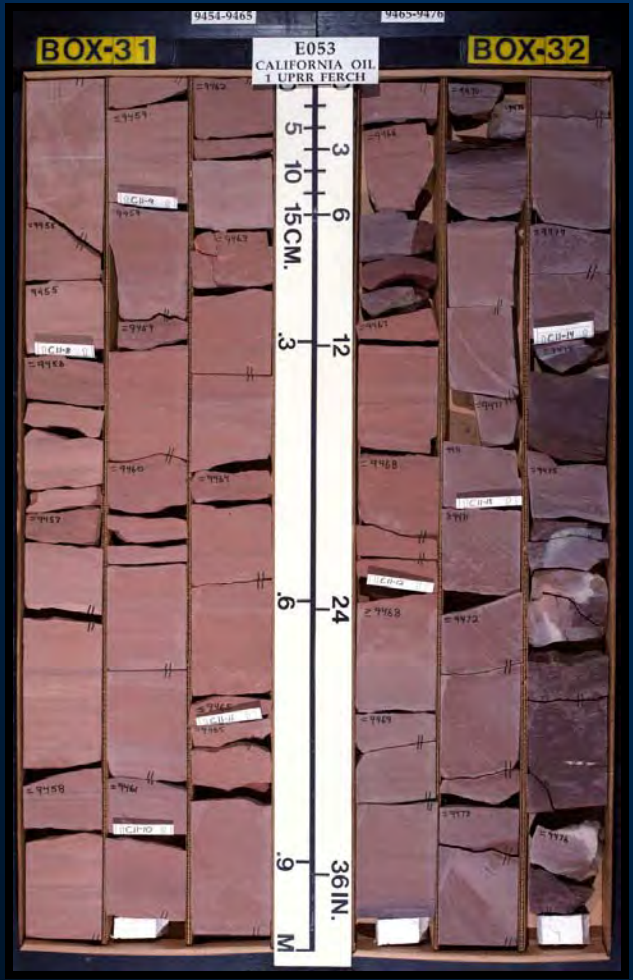
Questions?

Archive Collection



Core Photo

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