Core Handling for the WAIS Divide Ice Core Project

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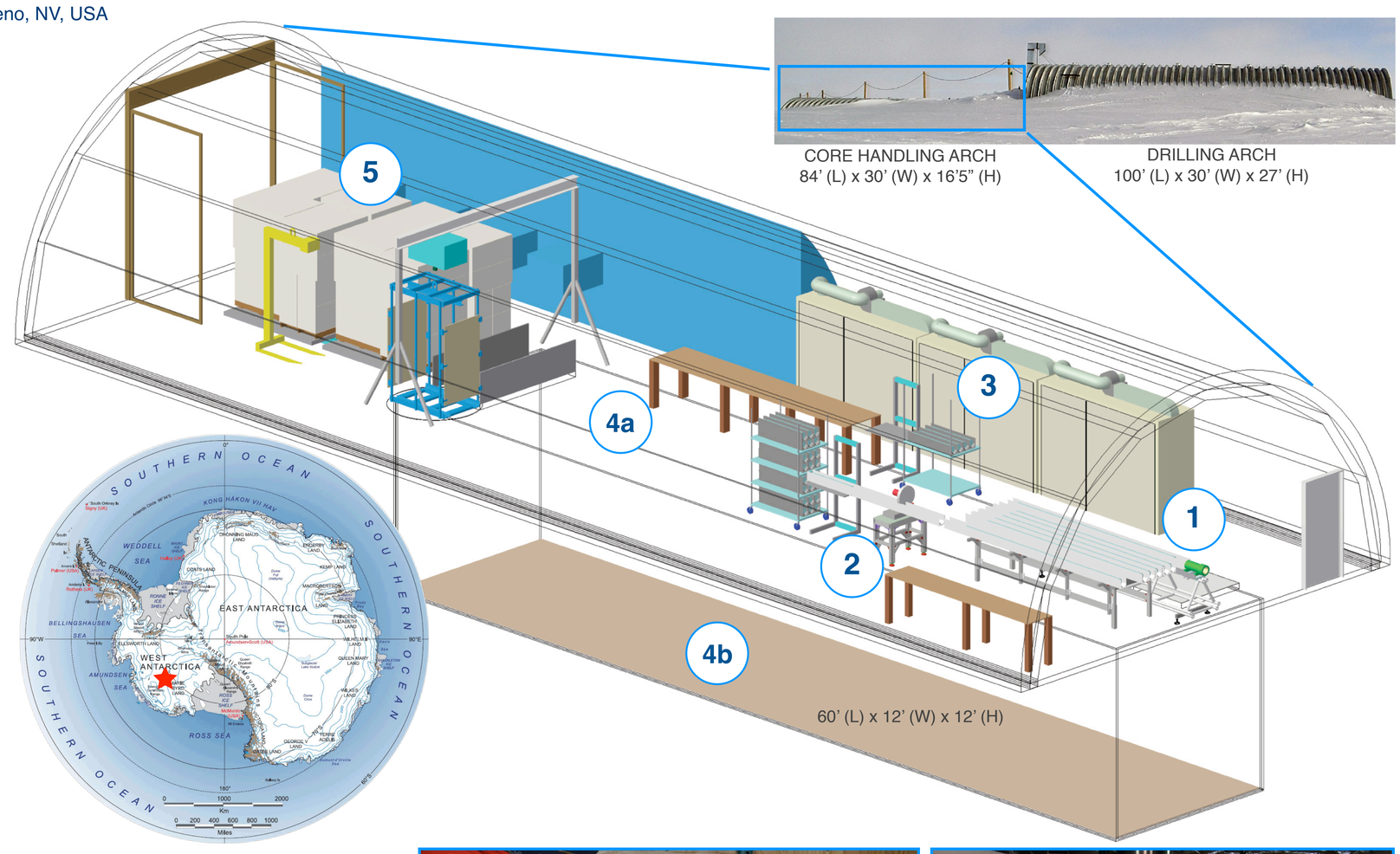
www.waisdivide.unh.edu

Background

- Final depth of 3,405 meters reached on Dec 1, 2011
- Longest U.S. ice core to date
- Highest quality U.S. deep ice core, including brittle ice



Core Handling Operations

1. Receiving

- Arch temperature between -20 and -30ºC; no thermal shock to core
- ~3.2 m long runs of core from DISC Drill received
- Very rigid and optically aligned push-out table
- Fluid Evacuation Device (FED) for removing drill fluid
- Laser Balluff system for measuring and logging core
- Brittle ice pushed directly into elastic netting

2. Cutting

- 3.2 m drill runs cut into 1m long cores
- Circular saw w/ tungsten carbide tipped 14” blade
- 1m cores stored in extruded aluminum trays
- Aluminum trays stored on roller racks

3. Drying

- Roller racks rolled into drying booths
- Active air drying (800 cfm) for drill fluid removal
- Typically <48 hours

4a. Packing

- 1m cores into 6-mil layflat and then into Al-coated cardboard core tubes
- 4 core tubes (packed in snow) / ISC box
- 8 ISC boxes / wood skid
- 4 wood skids / Air Force Pallet (AFP)
- HOBO temperature loggers inside ISC boxes & on each skid
- 1”-thick, quilted custom made insulated blanket under AFP netting

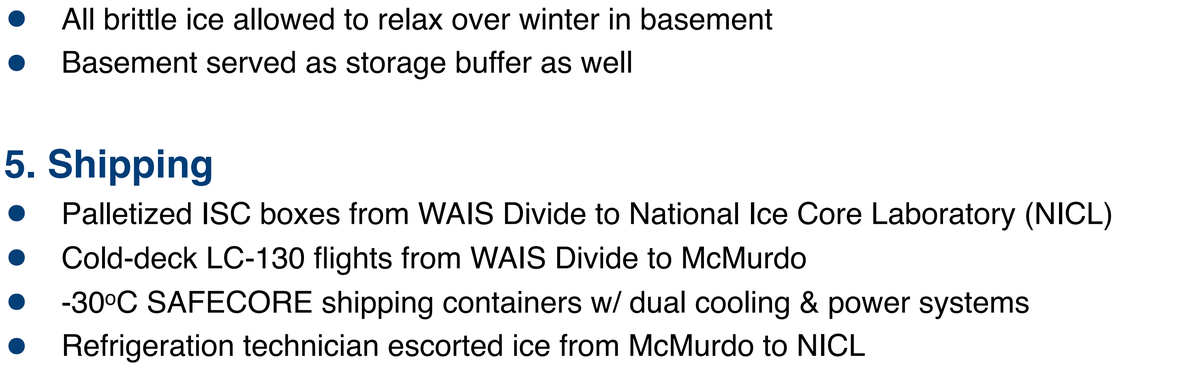
4b. Storage

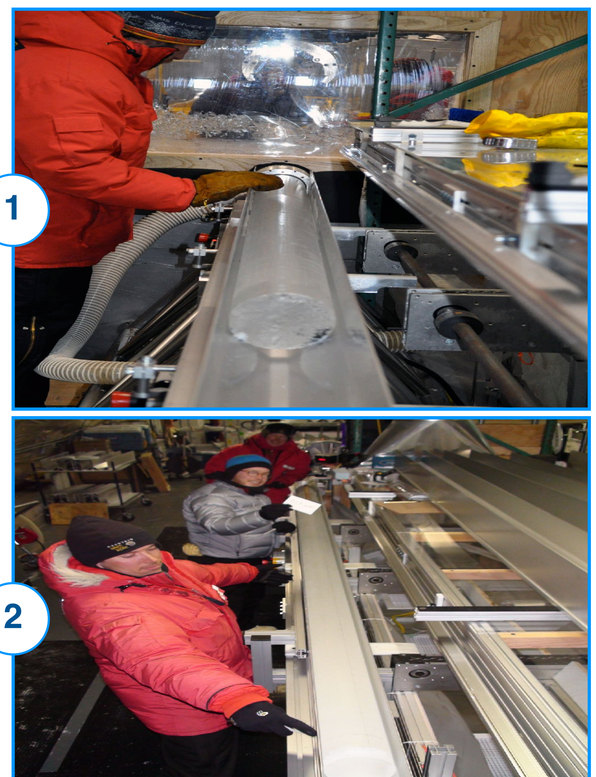
- 60’ (L) x 12’ (W) x 12’ (H) core storage basement
- Gantry crane for lowering/raising roller racks or ISC boxes into/out of basement
- All brittle ice allowed to relax over winter in basement
- Basement served as storage buffer as well

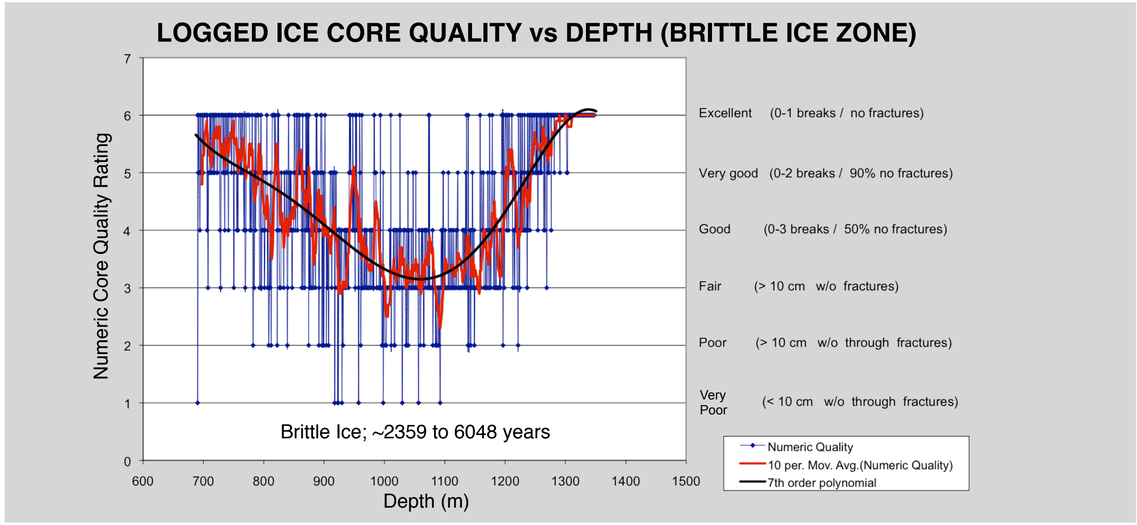
5. Shipping

- Palletized ISC boxes from WAIS Divide to National Ice Core Laboratory (NICL)
- Cold-deck LC-130 flights from WAIS Divide to McMurdo
- -30ºC SAFECORE shipping containers w/ dual cooling & power systems
- Refrigeration technician escorted ice from McMurdo to NICL
- Most secure shipments of ice U.S. has ever had

Season	Depths Drilled (m)	Meters Drilled	Drilling Days	Depths Shipped (m)	Meters Shipped
2006-07	0-114	114	5	0-114	114
2007-08	114-580	466	17	114-577	463
2008-09	580-1514	934	37	(none/brittle ice)	0
2009-10	1514-2564	1050	45	577-2001	1424
2010-11	2564-3331	767	43	2001-3331	1330
2011-12	3331-3405	74	7	3331-3405	74







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