ScHWD Development planned for 2016

- Augments the IDDO equipment inventory per the Long Range Plans
- Significantly broadens the range of science that can be supported
- Meets the science requirements identified by the research community
- Provides flexibility for a minimum logistical burden for field projects of a wide range of sizes
- Leverages the latest developments in hot water drilling and advances the technology with the numerous advantages of a microturbine generator that have potential applications across the polar programs.
The SmHWD systems are being upgraded over the next two years.

- Focus of upgrades will be safety, reliability, and mobility
- Implementing user-identified improvements
- 1 upgraded system (30 m depth capability) will be ready to deploy for 15-16 season
- 60 m system will complement Scalable Hot Water Drill (60-1000 m)

**Nominal hole type:** Dry  
**Nominal Diameter:** 6 cm (2.5 in)  
**Depth:** 30 m (dry), 60 m max (wet)  
**Rate in firn:** 2 m/min

Heater Replacement (lightweight)
- SS tubing rather than pipe
- Environmental burner cover
Sediment Laden Lake Ice Drill (Upcoming development)

IDDO is currently reviewing Science Requirements for the a new Sediment Laden Lake Ice Drill

Scientific Requirements (summarized/abbreviated):
• Produce access holes through clean or dirty ice less than 6m thick
• The drill should be field portable, with the ability to be carried by one...
• Diameter of holes needed between 5-25 cm
• Should require very little water to start the drilling, and would preferably recirculate the ice melt and seed water to avoid loss or contamination to the environment.
• Setup time for the drill should be within a half hour after initial unpacking on site, with drilling speeds of at least 25 cm diameter holes through a 6 m ice cover per hour for example.
• Helicopter transportable, packed in cases that can be lifted by a maximum of two people
• One person should be able to do the drilling operations in the field
• Permanent indictors on the hose indicating depth and the distance to the tip
• Drill should be able to be used to free up cables frozen in the ice, including riding them down through the ice
• Materials used should be as non-corrosive as possible from fresh to sea water salinities
• The design should be easily cleanable with standard solvents/sterilants

One approach is to modify or add on to a Hotsy-type unit recently shipped to IDDO from McMurdo (previously used by Peter Doran)
• Addition of submersible pump
• Addition of heat exchanger
• Swappable nozzles
• Verify material compatibility (for sea water, etc.)