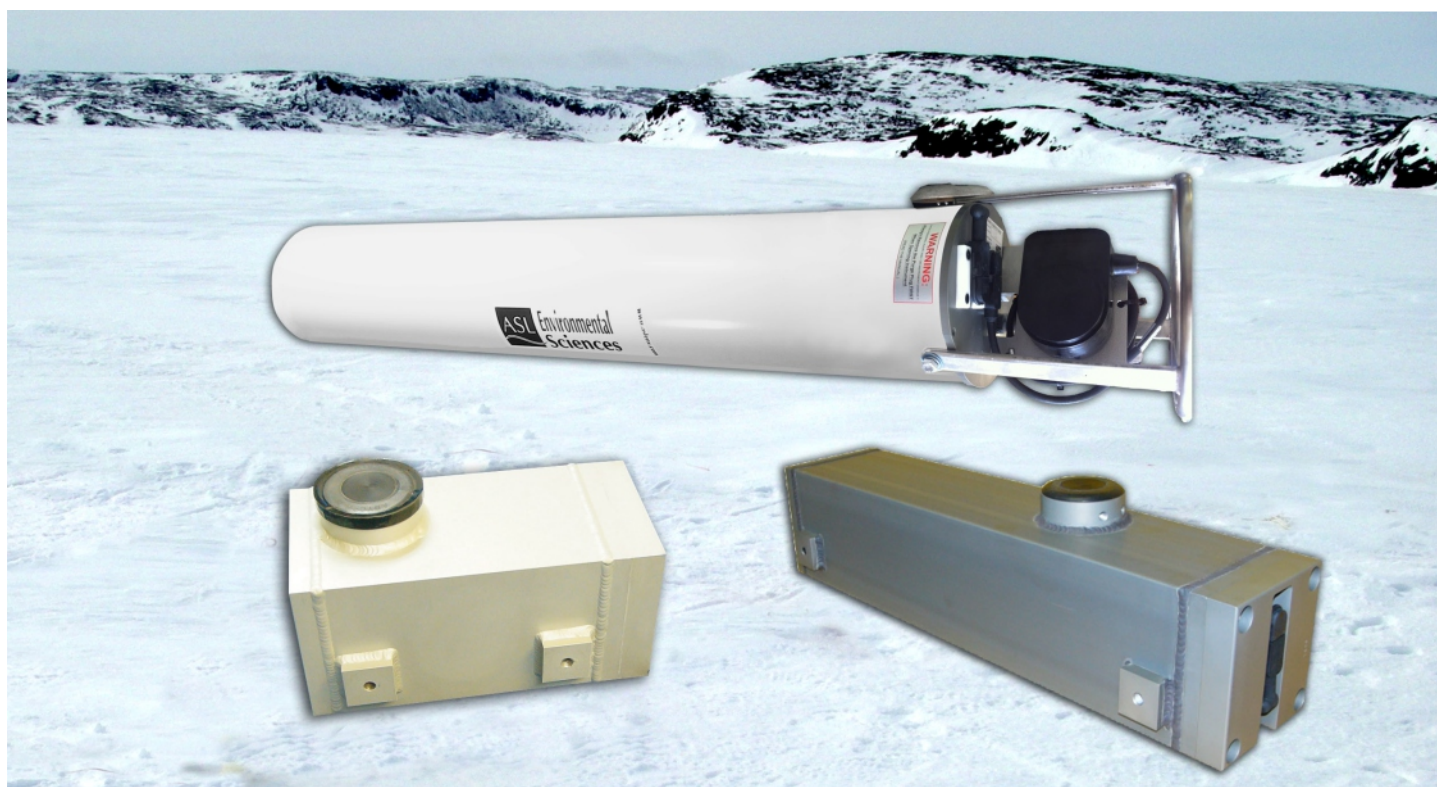




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# Shallow Water Ice Profiler (SWIP)<sup>TM</sup>



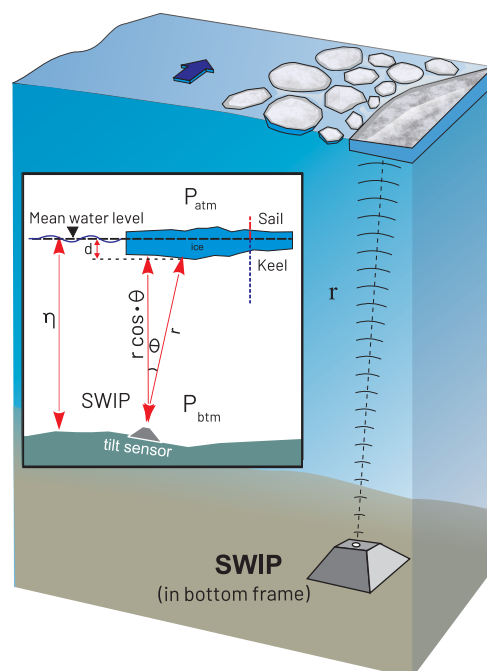
## Applications

In-situ measurements are essential for understanding and monitoring lake, river and tidal ice dynamics. The SWIP now facilitates measurements for applications such as:

- River ice cover monitoring for flood control
- River, lake and estuary ice research
- Frazil ice monitoring near potable and cooling water intakes

## Features

- Monitor and record ice targets at the water surface
- Record backscatter returns from ice particles suspended in the water column (frazil ice)
- Up to 2 Hz continuous sampling
- Excellent horizontal resolution - 542 kHz transducer, 6° beam width
- Low power requirements (shore power or internal battery pack)
- Robust low-profile housing
- Large on-board data capacity (up to 16 Gbyte) by Compact Flash
- Real-time RS-232 communications or RS-422 for cabled installations > 15 m
- Versatile Windows-based software for deployment planning and initialization, instrument testing and downloading of stored data



Typical SWIP deployment



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f in y



## SWIP Specifications

## Shallow Water Ice Profiler (SWIP)™

### UPWARD LOOKING SONAR

	(Standard)	(Optional)
Operating Frequency	542 kHz	235 kHz
Beam Width	6°	11°
Sampling Rate	up to 2 Hz	
Duty Cycle	up to 100%	
Maximum Range	20 m	
Precision	± 0.05 m (ice draft)	

### REALTIME CLOCK

Accuracy	± 5 min/year
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### DATA STORAGE

Standard	8 GB Compact Flash
Optional	16 GB Compact Flash
	(External) (Internal)
<b>POWER</b>	8-15 VDC 40 Ahr
	1 A (Peak) 200 Ahr

### TILT SENSOR

Range	± 20°
Accuracy	± 0.5°
Precision	0.01° (noise level)

### TEMPERATURE SENSOR

Accuracy	± 0.1°C
Resolution	0.05°C

### ABSOLUTE PRESSURE SENSOR

3 Bar Strain Gauge	
Range	0 - 20 m

### SIZE

External Power	27 cm x 15 cm x 15 cm
40 Ahr	62 cm x 15 cm x 15 cm
200 Ahr	117 cm x 17 cm x 17 cm

### OPTIONAL FEATURES

- 235 kHz frequency with 11° beam width (for slush and thermal ice studies)
- Magnesium/Zinc anodes for fresh/salt water corrosion protection
- Simple aluminum bottom mounting platform
- Heated pyramid shaped ice resistant bottom frame
- Shore-based barometer for draft calculations
- Polyurethane jacketed cable (max 1200 m long)
- Armoured cable (max 300 m long)
- Customized shore-based data management system for SWIP and integrated ADCP
- Mounting design assistance and equipment available upon request
- Ice Profiler Processing Toolbox™ software for processing and analysis of SWIP and ADCP ice velocity data sets.
- Acoustic Profile Analyzer - visualization of acoustic backscatter profiles
- Data Processing Services

Example Ice Draft Measurements

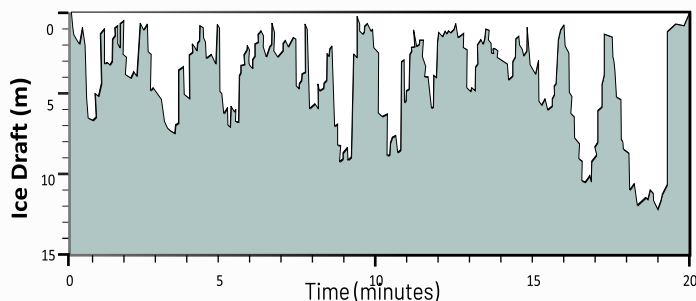


Photo courtesy of Dr. Eliisa Lotsari, U. Eastern Finland

### Mounting Considerations

- Position instrument within ± 15° of horizontal
- Verify transducer tilt at deployment
- Planning for ice impact and anchor ice issues
- Installing with divers recommended



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