

SWIP™

Shallow Water Ice Profiler™



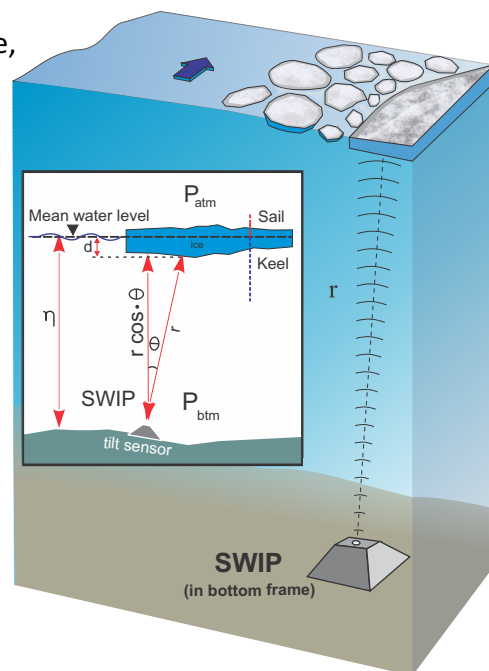
Applications

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

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, 3° half-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

SWIP Specifications

UPWARD LOOKING SONAR

	(Standard)	(Optional)
Operating Frequency	542 kHz	235 kHz
Half-beam Width	3.0°	5.5°
	(center beam to half-power point)	
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

DATA STORAGE

Standard	8 GB Compact Flash	
Optional	16 GB Compact Flash	(External) (Internal)

POWER

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

* Assumes variations in sound speed and density are accounted for.

OPTIONAL FEATURES

- 235 kHz frequency with 5.5° half-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 communications cable to shore station
- Customized shore-based data management system for SWIP and integrated ADCP
- Mounting design assistance and equipment available upon request
- Acoustic Profile Analyzer - visualization of acoustic backscatter profiles
- Data Processing Services

Example Ice Draft Measurements

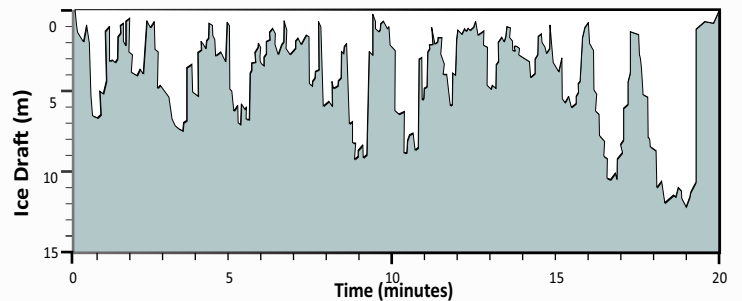


Photo courtesy of Dr. Eliisa Lotsari, U. Eastern Finland

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