

SWIP™

Shallow Water Ice Profiler™



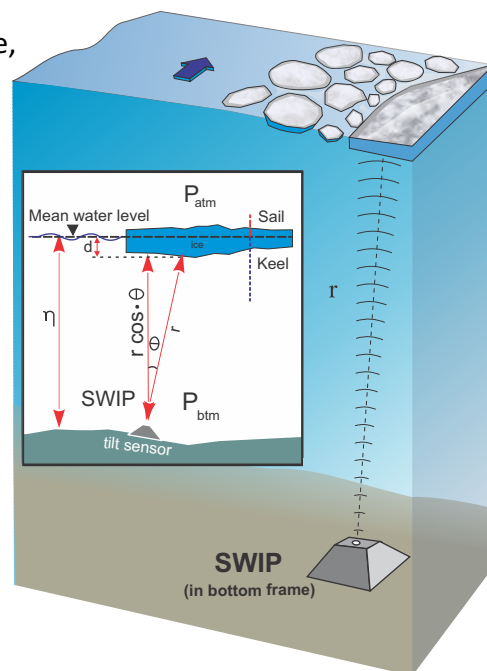
Applications

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 |

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

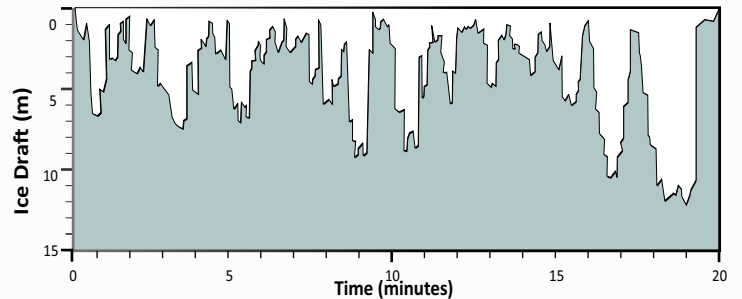


Photo courtesy of Dr. Eliisa Lotsari, U. Eastern Finland

Mounting Considerations

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