Non-invasive, highly vertical resolved observations of sea-ice biomass

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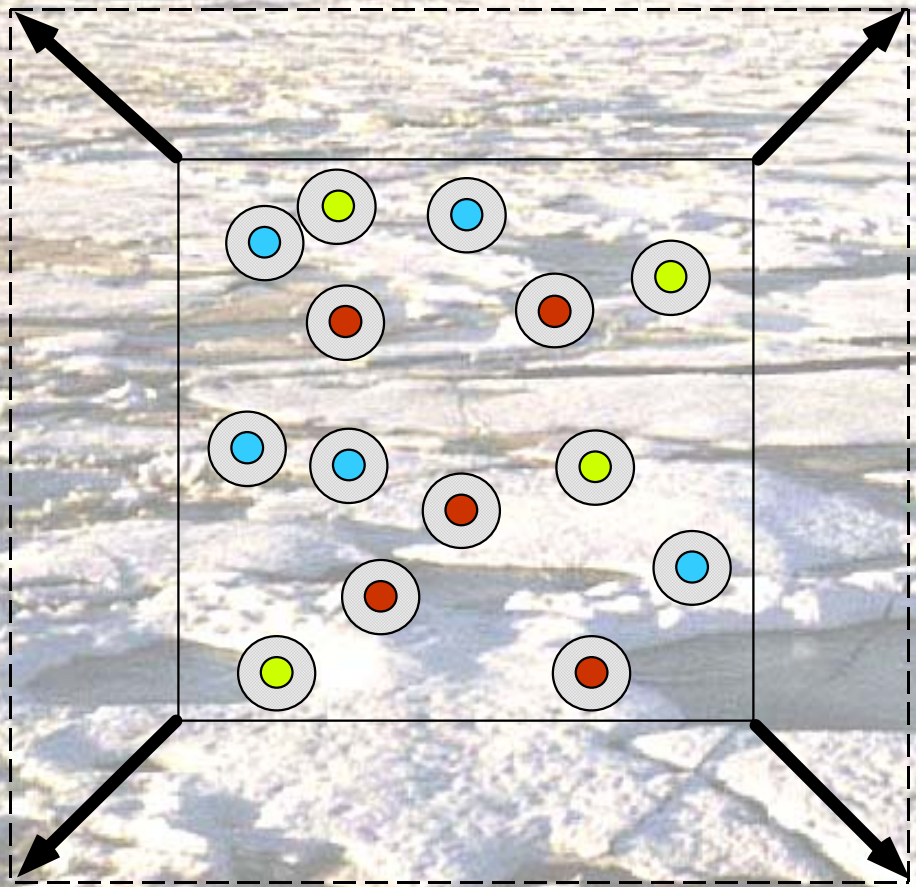


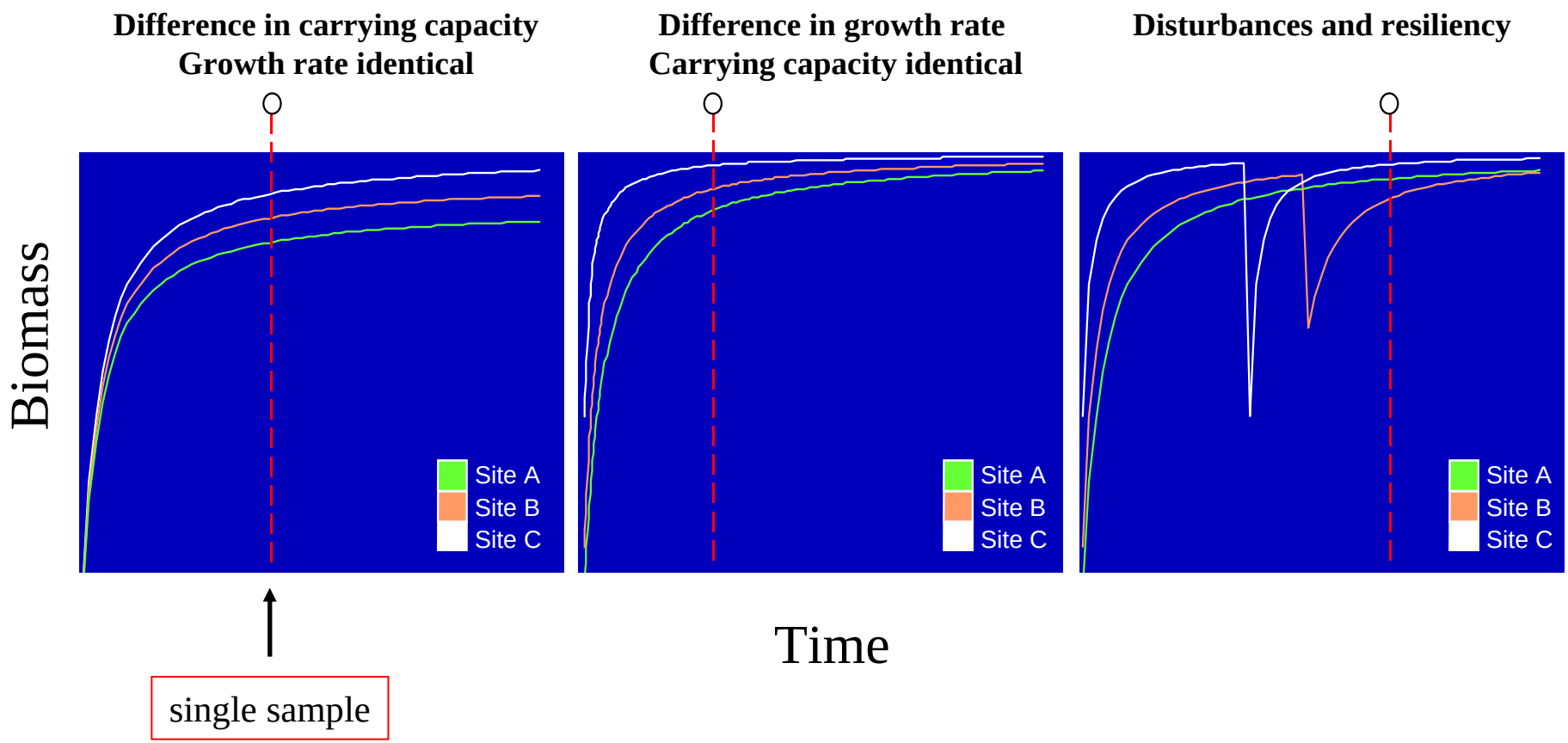
Dilemma of time series:

Sampling of many ice cores impacts processes in question

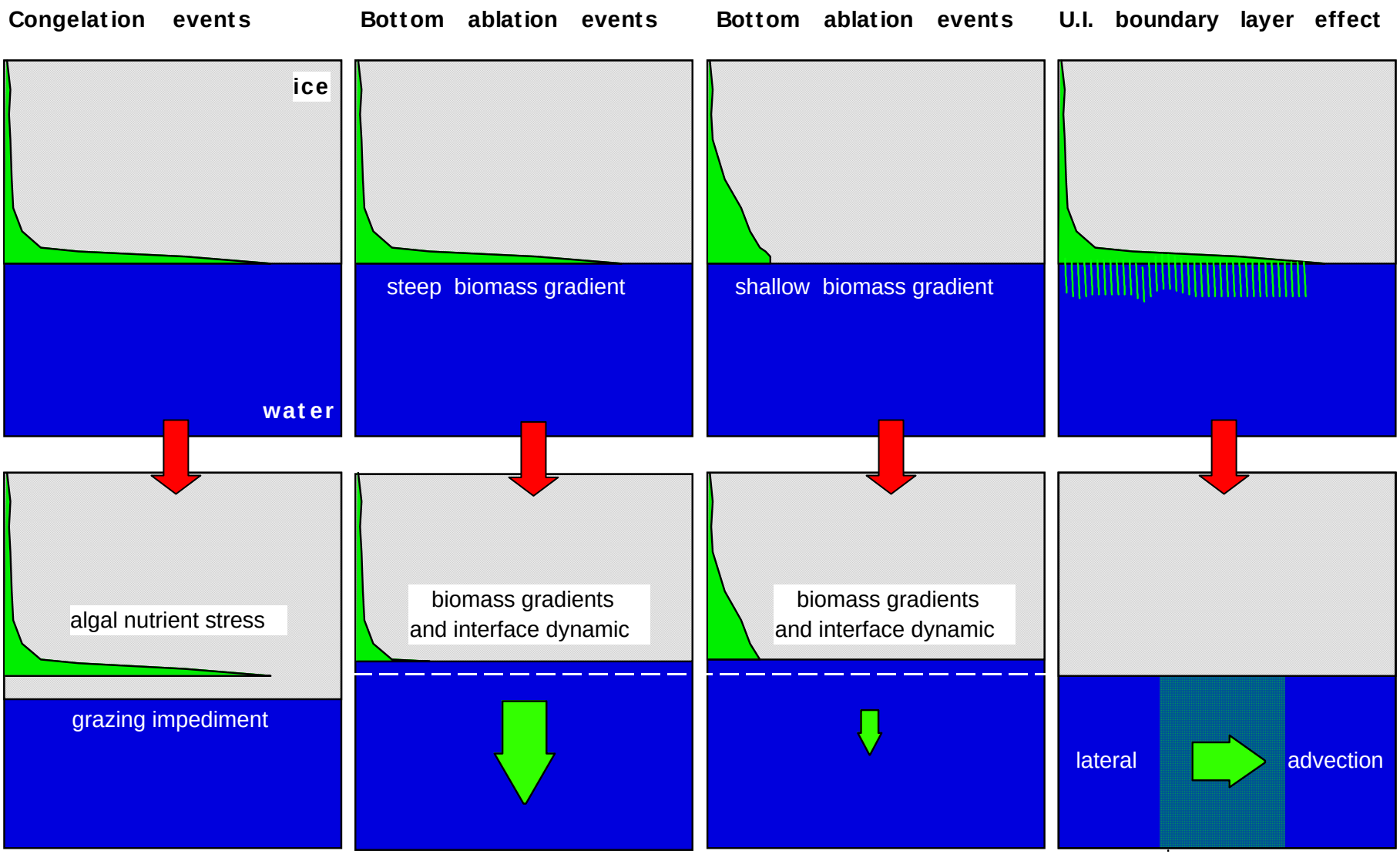
Increasing the sample area increases spatial variability

To improve in-situ process studies and test heterogeneity as an independent variable
one needs to separate temporal and spatial variability

Separation of temporal and **spatial variability**



The importance of resolving vertical gradients and disturbances



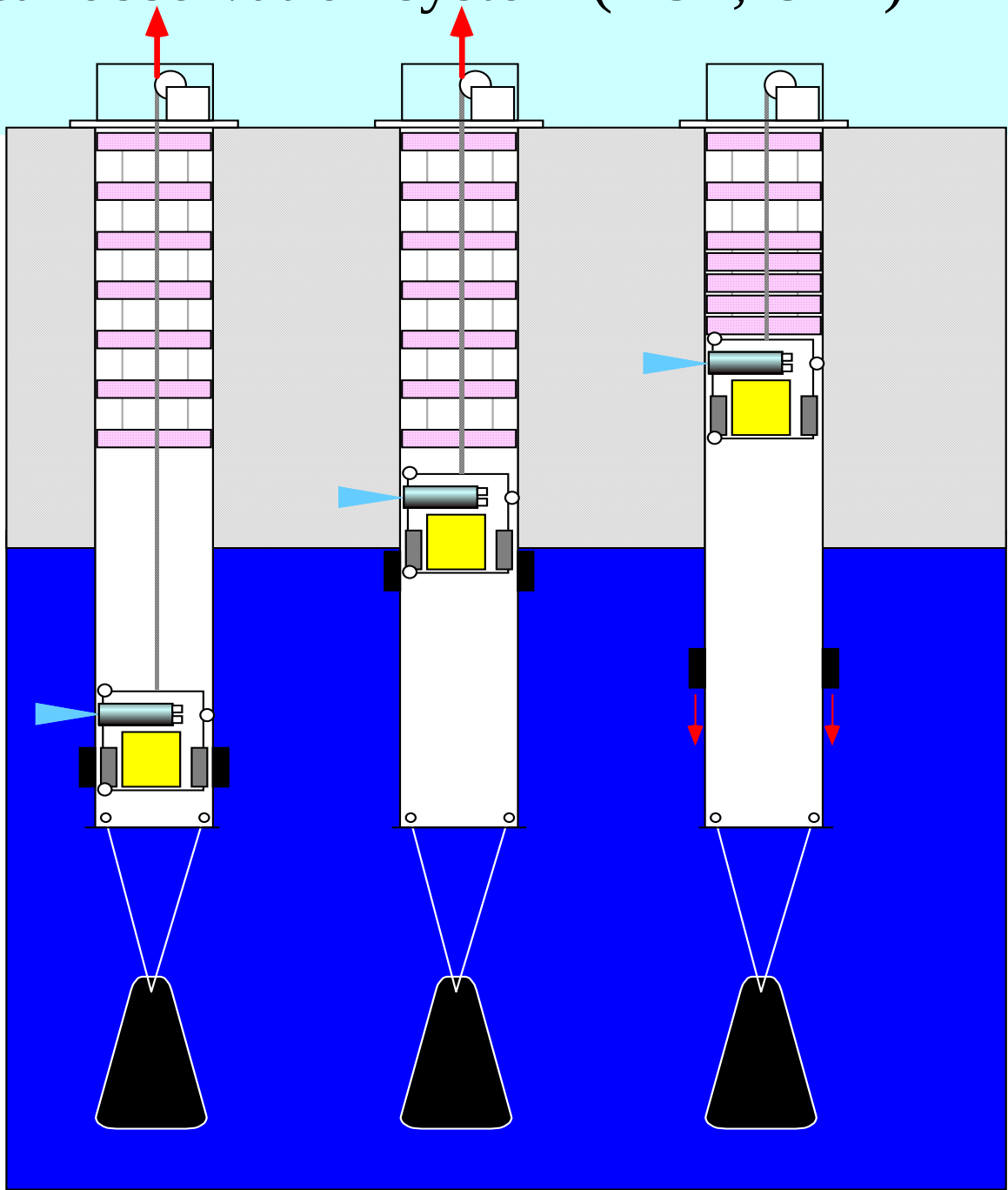
IS-BIOS: In situ biological observation system (NSF, OPP)

Advantages:

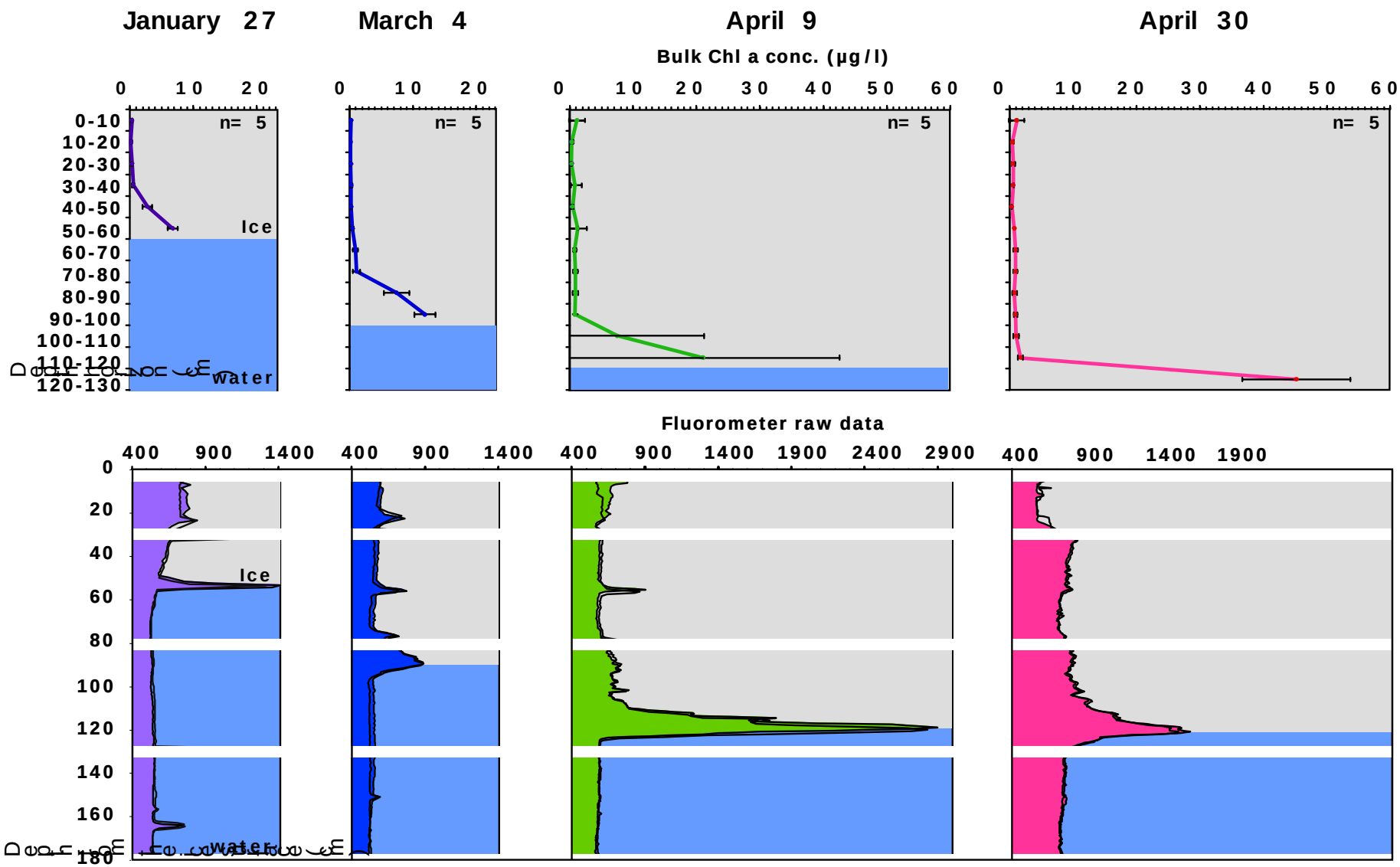
- **Flexible operation: Stationary and profiling mode**
- **Unified anti-fouling and anti-freeze system**
- **Modular sensor system (no pressure housings)**
- **Non-destructive, high temporal, and vertical sampling of vertical gradients**
- **Instantaneous in situ data for strategic support**

Disadvantage:

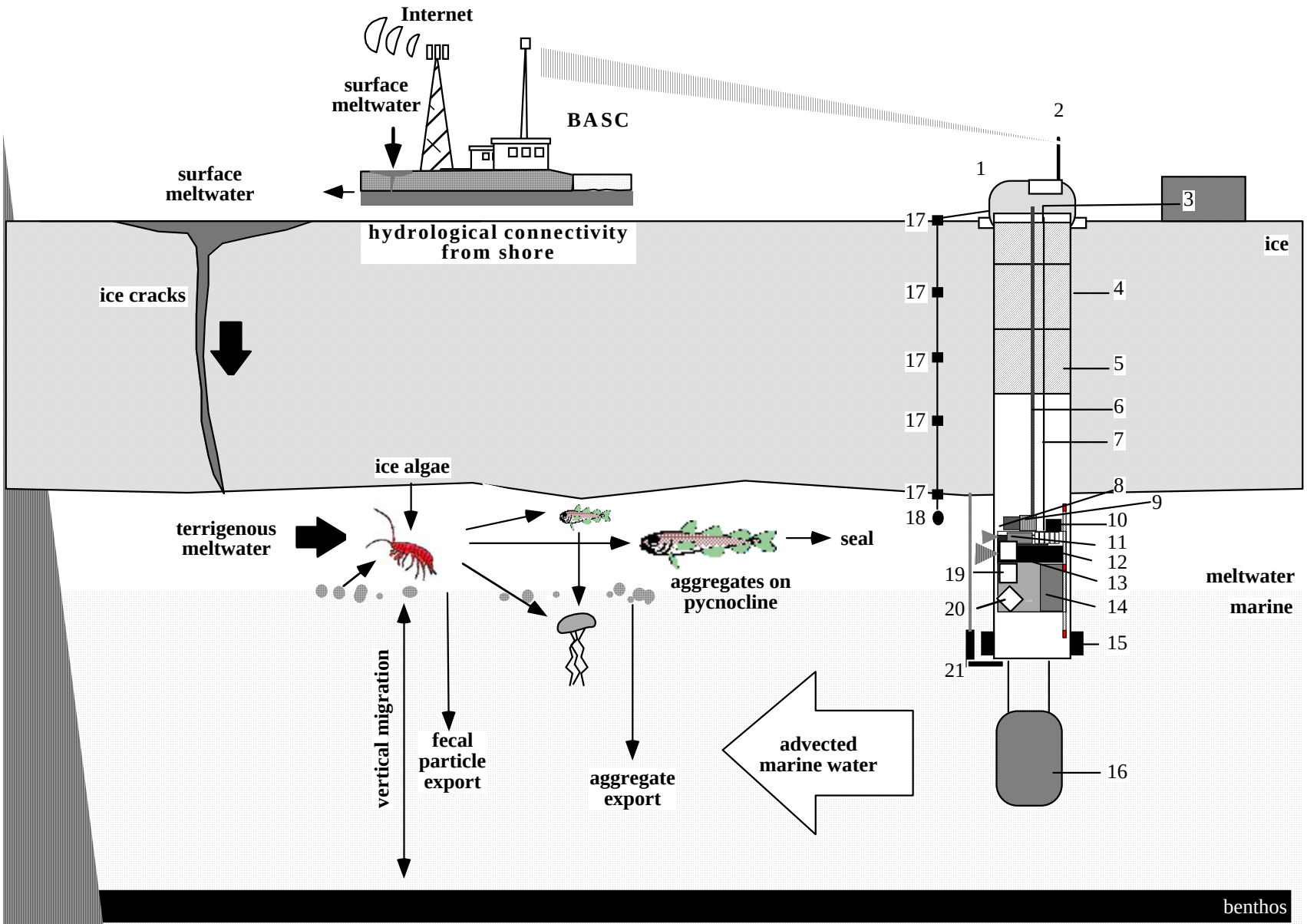
- **Little horizontal scale resolution**



Data examples Barrow 2003



Planned coastal expansion



Conclusion

System is well suited to be integrated into ice tethered buoy nodes

...to study basin-wide

•timing and geographic extent of physical forcing events and the resulting dynamic of sea-ice biomass

•change in accessibility of sea-ice biomass to grazers

•and timing of release of organic material to the water column