Germano & Associates, Inc.

Sediment Profile Imaging (SPI)

Rapid Seafloor Reconnaissance and Assessment

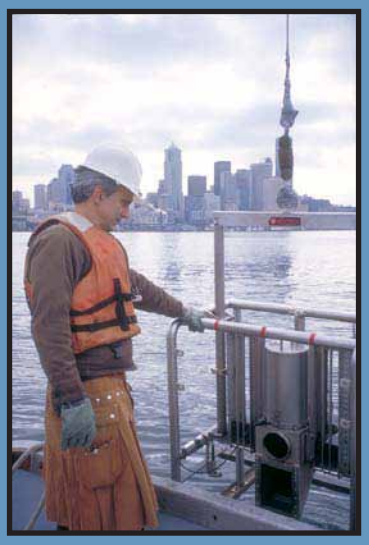
Sediment Profile Imaging -

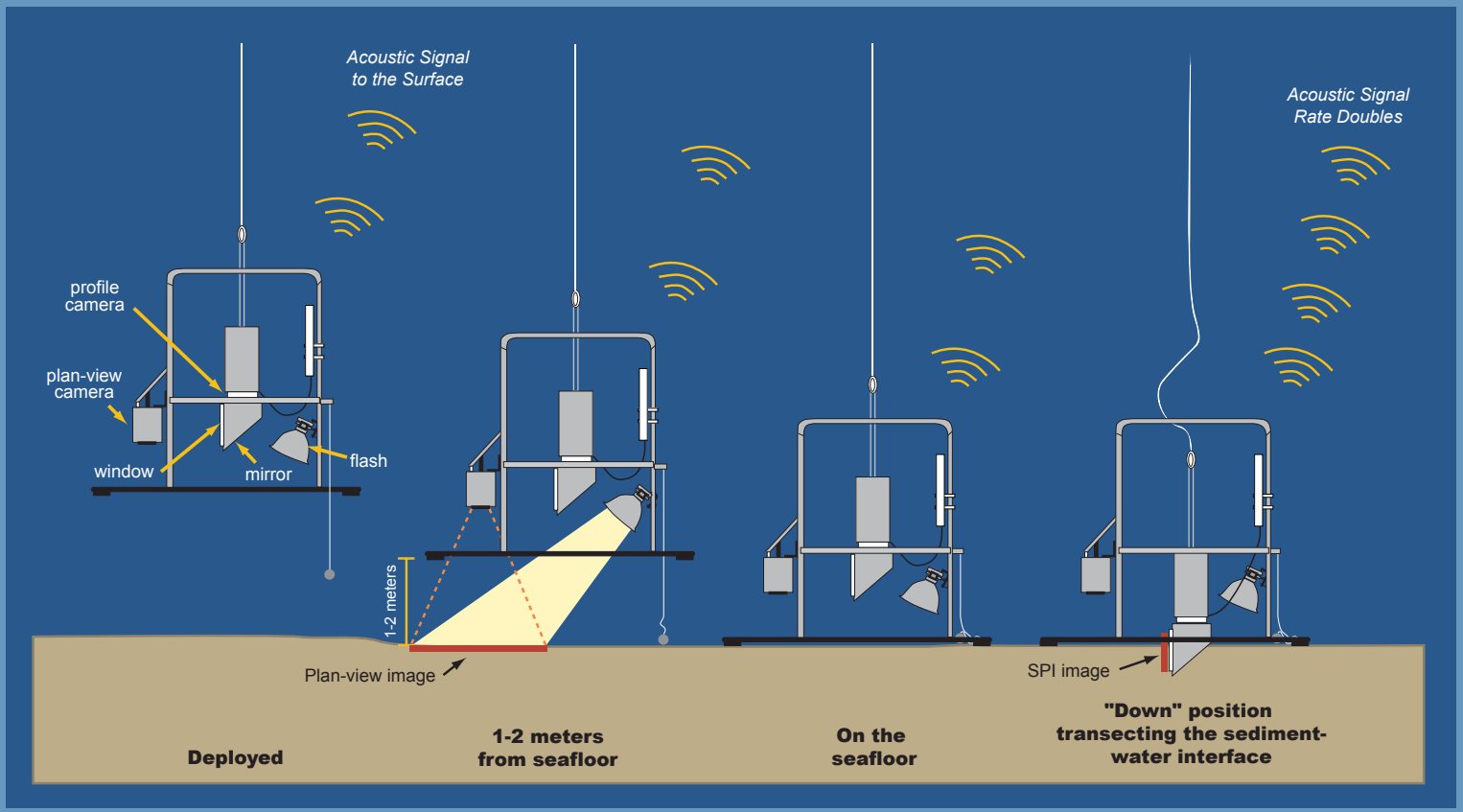
provides an alternative approach to traditional sampling technologies and is a rapid, cost effective method for mapping changes in the surface of the seafloor. This innovative optical technique can quickly image, measure, and analyze physical, chemical, and biological parameters over large areas of the bottom of lakes, rivers, estuaries, and oceans.

What Does SPI Measure?

The digital images are rapidly analyzed by a computer image analysis system. The software allows rapid measurement and storage of a wide variety of imaged features from each photograph, including:

- *Grain size - major mode and range*
- *Small-scale surface boundary roughness*
- *Dredged-material or drilling mud thickness*
- *Depth of the apparent redox potential discontinuity (RPD)*
- *Erosional or depositional features such as ripples, mud clasts, and laminated or bedded intervals*
- *Subsurface methane gas pockets*
- *Epifauna*
- *Tube density of benthic infauna (number per linear cm)*
- *Thickness of pelletal layers*
- *Surface aggregations of bacteria*
- *Infaunal successional stage*





For more information on our SPI capabilities, please call Dr. Joseph Germano.

Applications:

SPI technology has a long history of successful applications for:

- *Reconnaissance surveys to develop the most efficient grab or box core sampling design*
- *Sediment quality surveys and identification of pollution "hot spots"*
- *Dredged material site designation studies*
- *Confined and unconfined ocean disposal site monitoring*
- *Assessment of low dissolved oxygen*
- *Aquaculture impact assessment*
- *Oil platform impact assessment*
- *Coastal municipal sewage discharge impact assessment*
- *Industrial discharge (pulp and paper mill, log storage and transfer facilities, mine tailings, etc.) impact assessment*

SPI Technology Will Allow You To:

- *Collect and analyze data rapidly and cost effectively*
- *Develop technically defensible response materials*
- *Create economical sampling designs for expensive ground-truth samples*
- *Achieve broad area coverage (to supplement traditional chemical and biological samples)*
- *Convey ecological information in a clear, unambiguous format, that is easily understandable by the public*

An SPI photograph from a healthy mud bottom shows a sub-surface feeding void from a community of deposit-feeding marine worms.

An SPI photograph taken in the vicinity of a fish farm shows the effects of organic enrichment: a 3-cm thick layer of anoxic waste from the fish pens is covering the seafloor and preventing any oxygen from reaching the underlying sediment.

Technical Details

- High resolution digital images instantly available in the field (16.2 megapixel DX-Format CMOS Sensor with 12-bit RGB color)
- Deep sea digital plan-view camera (16.2 megapixel DX-Format CMOS Sensor) can be added to the SPI frame (see photo above) with bottom contact switch for acquisition of seafloor surface image before frame lands
- Camera depth rated to 4,000m
- Rapidly shipped via air freight to any location
- Easily deployed from vessels of opportunity (only requires a winch)
- Capacity to do time-lapse imaging at 5 or 60-minute intervals in 4000 m cameras, user-selected programmable time-lapse intervals for 1000m cameras.
- Replicate images collected in less than a minute
- Sediment profile image quality is never affected by water turbidity; clear, high-resolution images always obtained

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