# Riverine/Estuarine Sediment Transport Dynamics: Time Series Observations-Transport Implications

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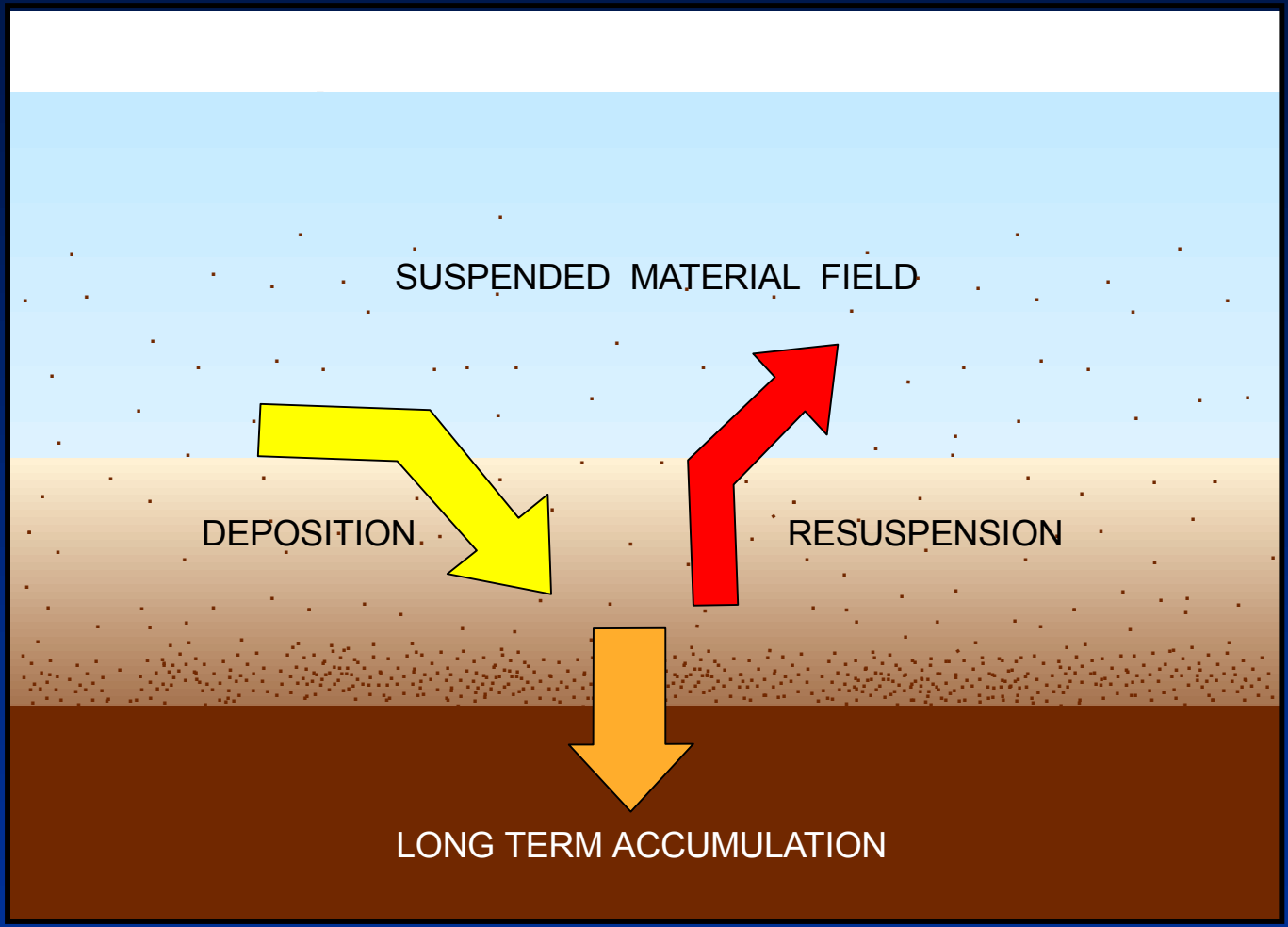
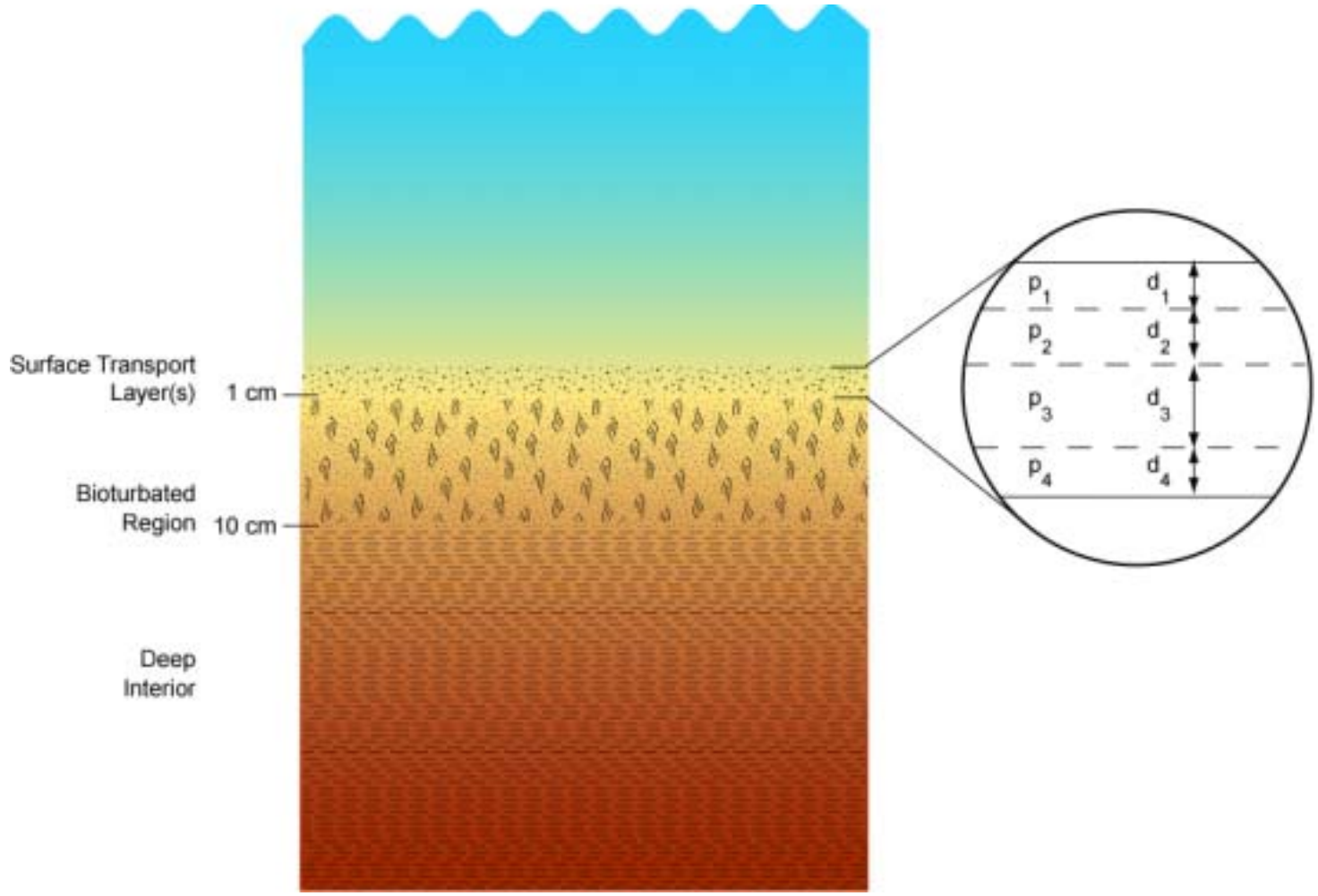
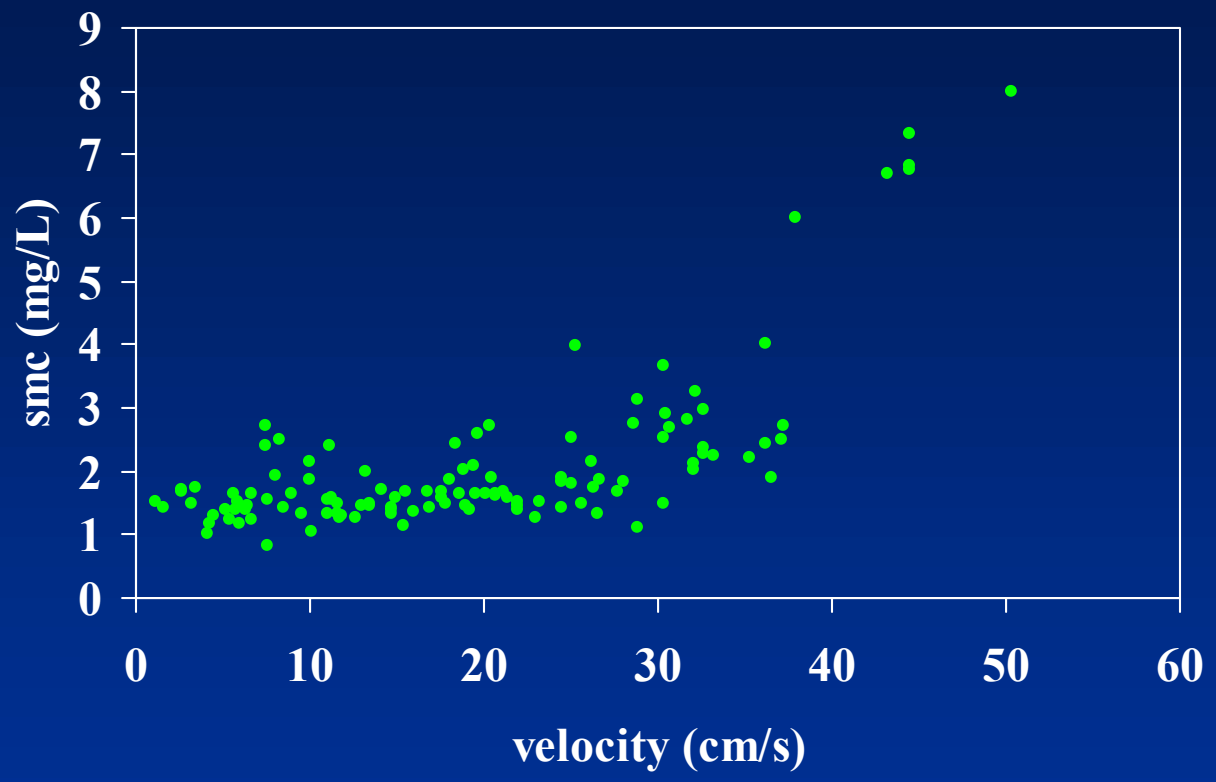

SUSPENDED MATERIAL FIELD
DEPOSITION
RESUSPENSION
LONG TERM ACCUMULATION

# REMOTS PHOTO

**FVP Program**
**June, 1984**

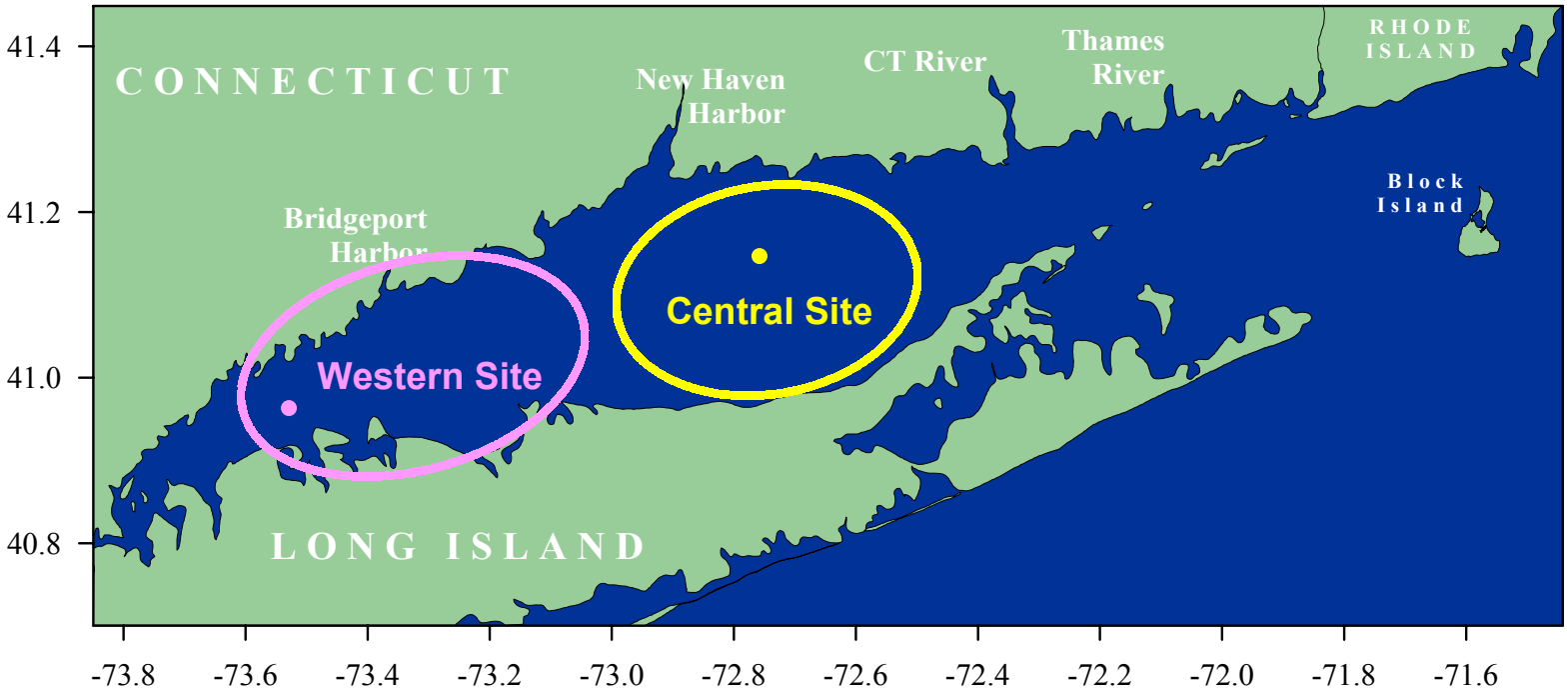

Surface Transport
Layer(s)
1 cm
Bioturbated
Region
10 cm
Deep
Interior
$p_1$
$d_1$
$p_2$
$d_2$
$p_3$
$d_3$
$p_4$
$d_4$

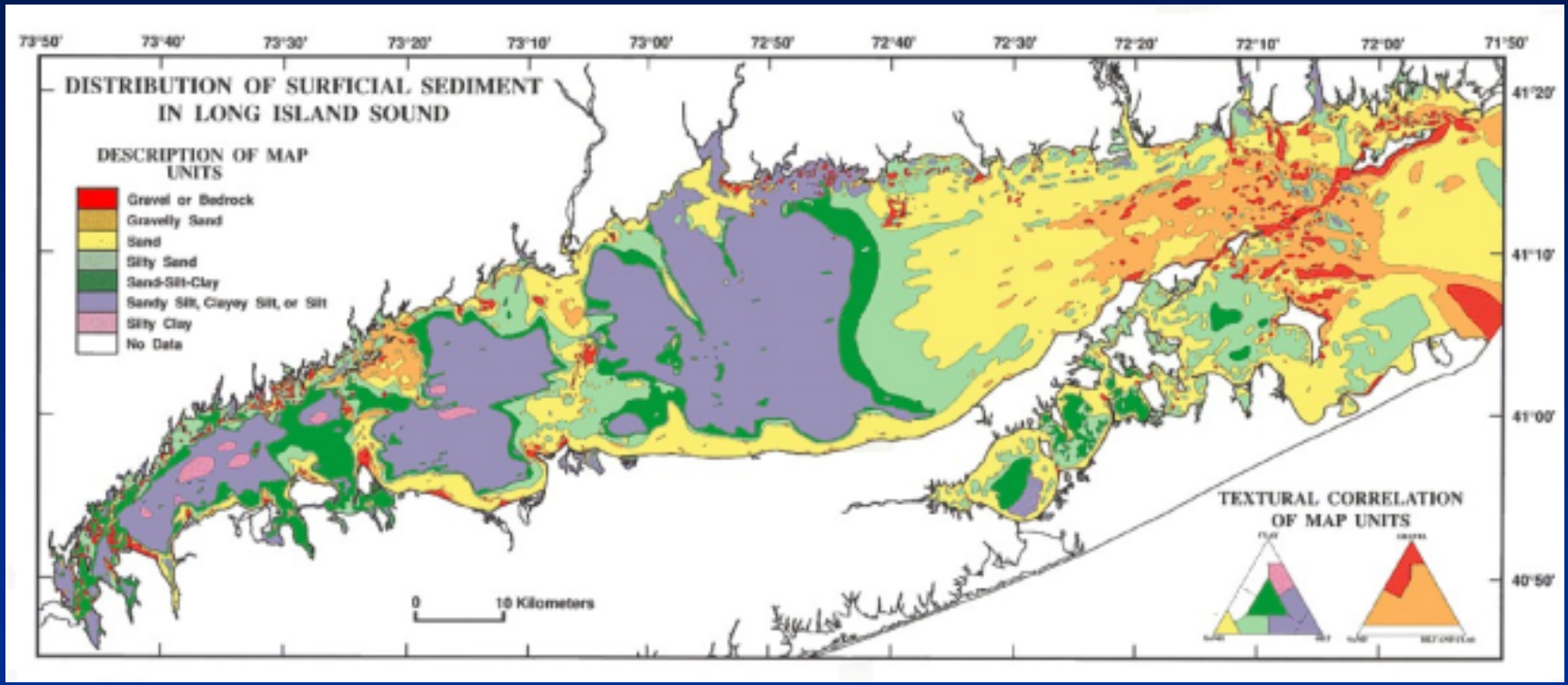
Lavelle, 1984




$$E = \alpha |\tau|^n$$

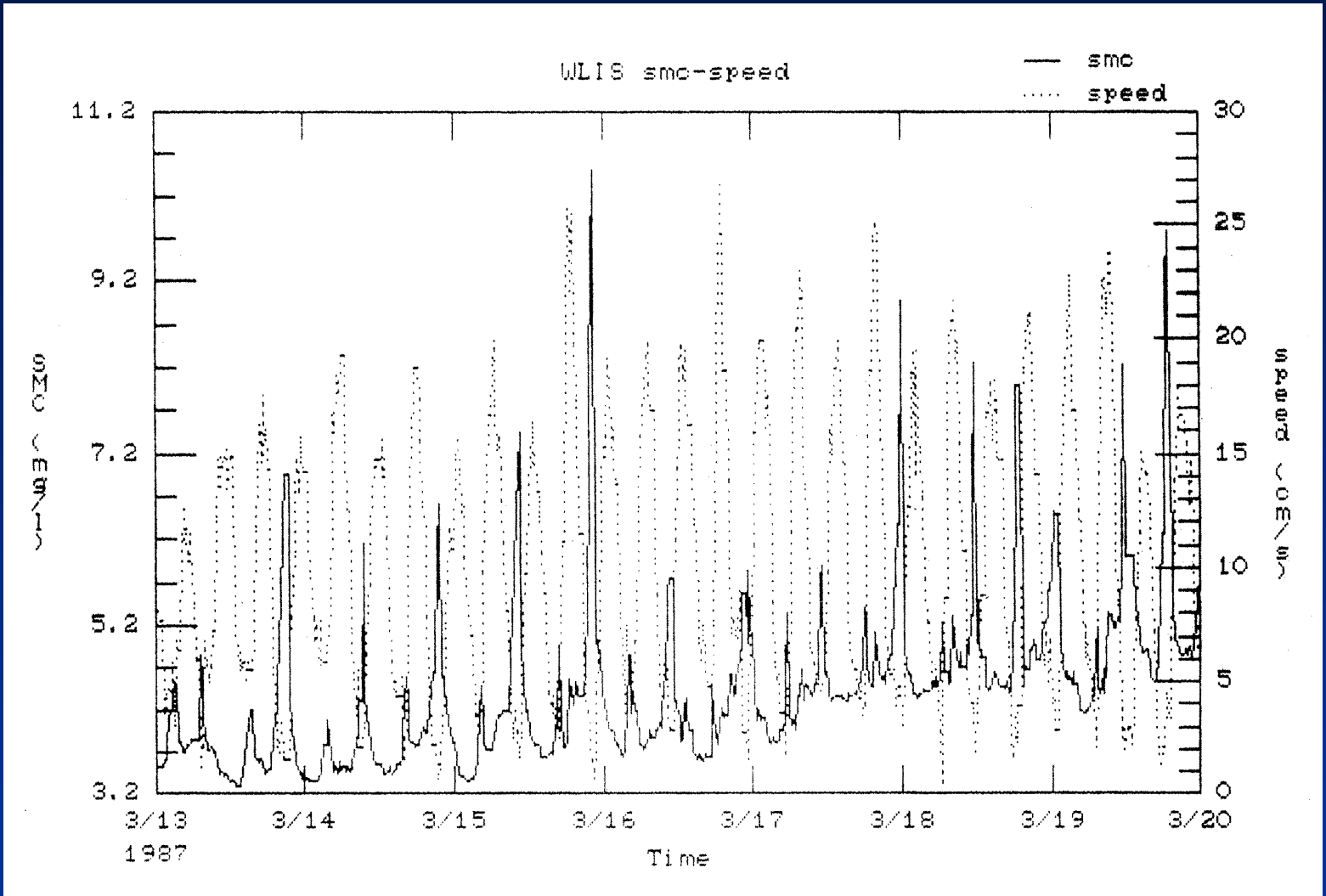
# Long Island Sound



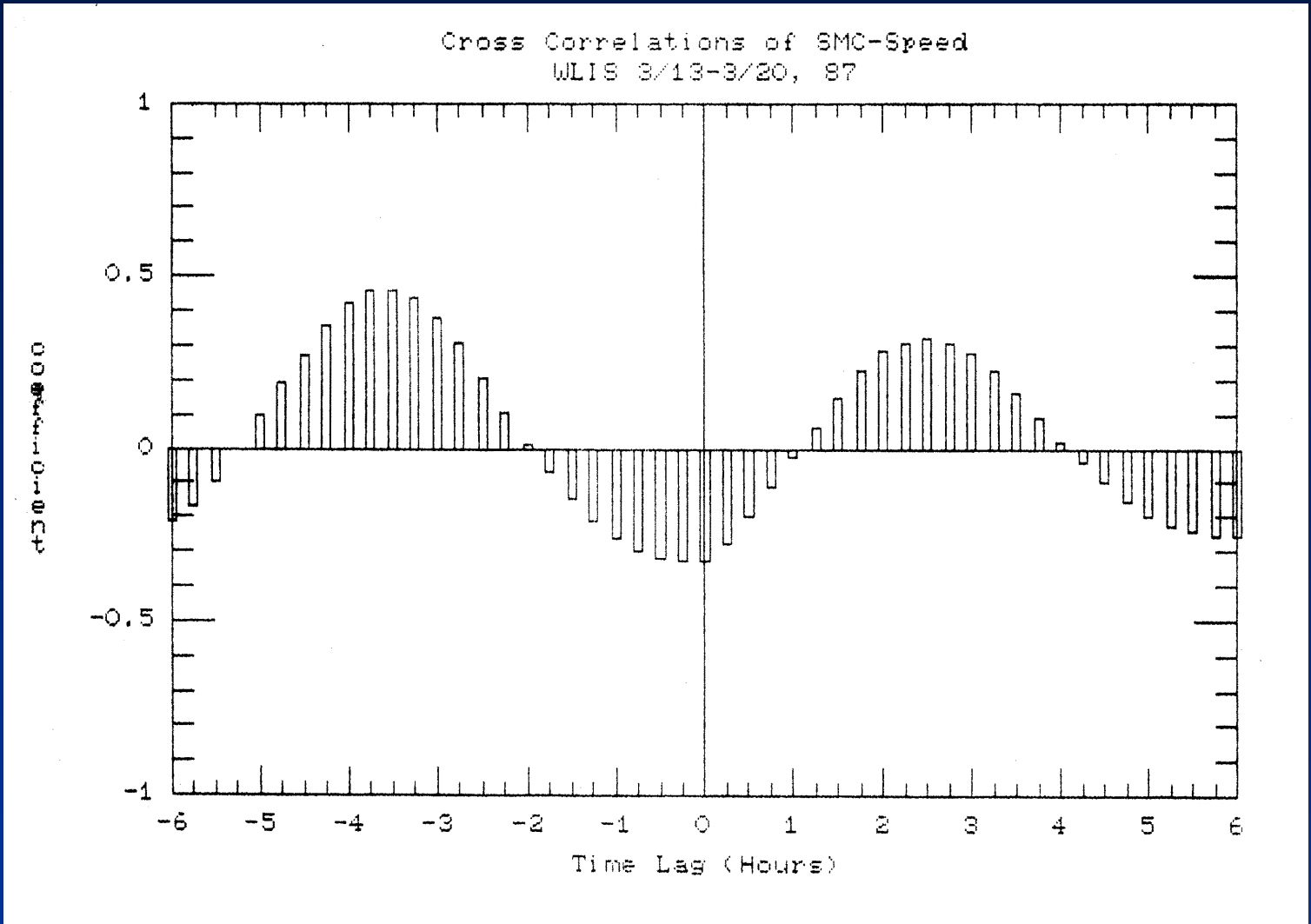

DISTRIBUTION OF SURFICIAL SEDIMENT
IN LONG ISLAND SOUND
DESCRIPTION OF MAP UNITS
Gravel or Bedrock
Gravelly Sand
Sand
Silty Sand
Sand-Silt-Clay
Sandy Silt, Clayey Silt, or Silt
Silty Clay
No Data
0
10 Kilometers
TEXTURAL CORRELATION
OF MAP UNITS
73°50'
73°40'
73°30'
73°20'
73°10'
73°00'
72°50'
72°40'
72°30'
72°20'
72°10'
72°00'
71°50'
41°20'
41°10'
41°00'
40°50'

Datalogger
Marsh-McBirney
EM current meter
Red-light transmissometers

# Western Long Island Sound : March 13-20, 1987

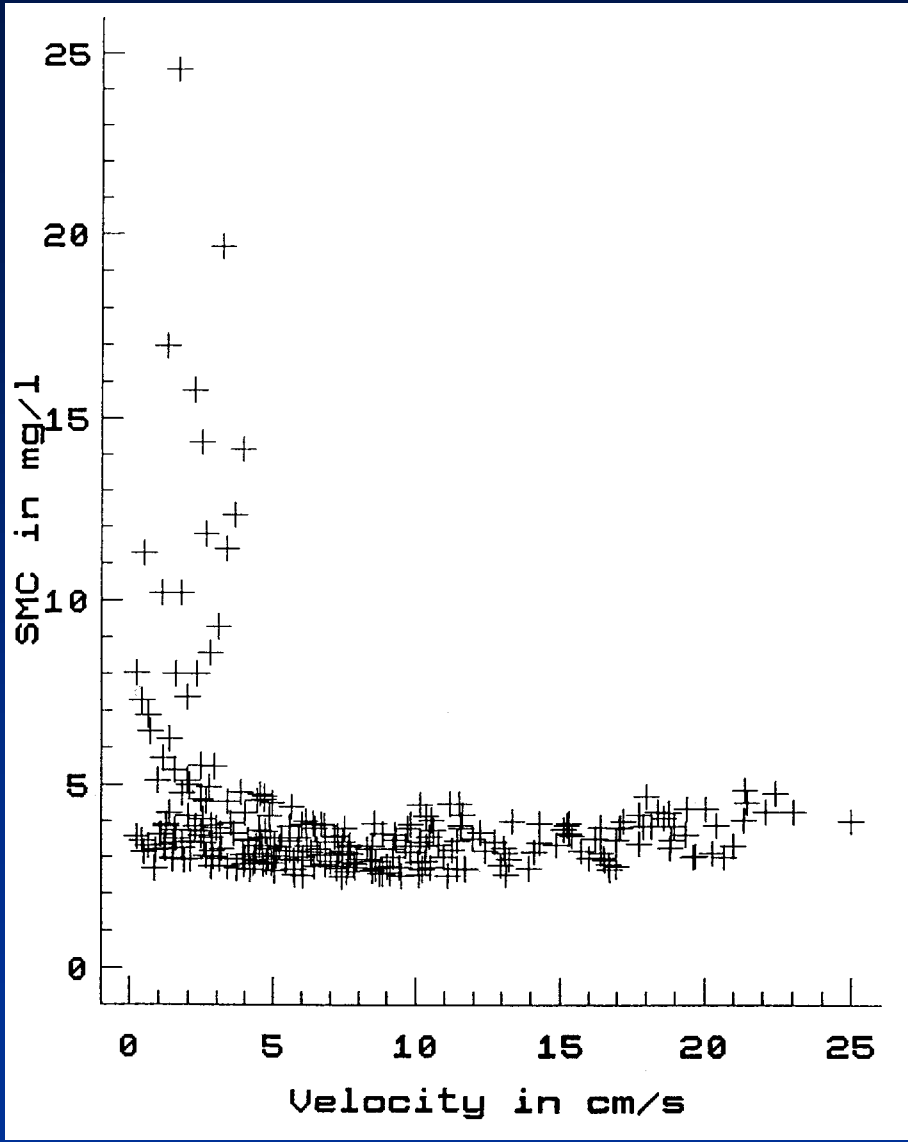


# Western Long Island Sound : March 13-20, 1987

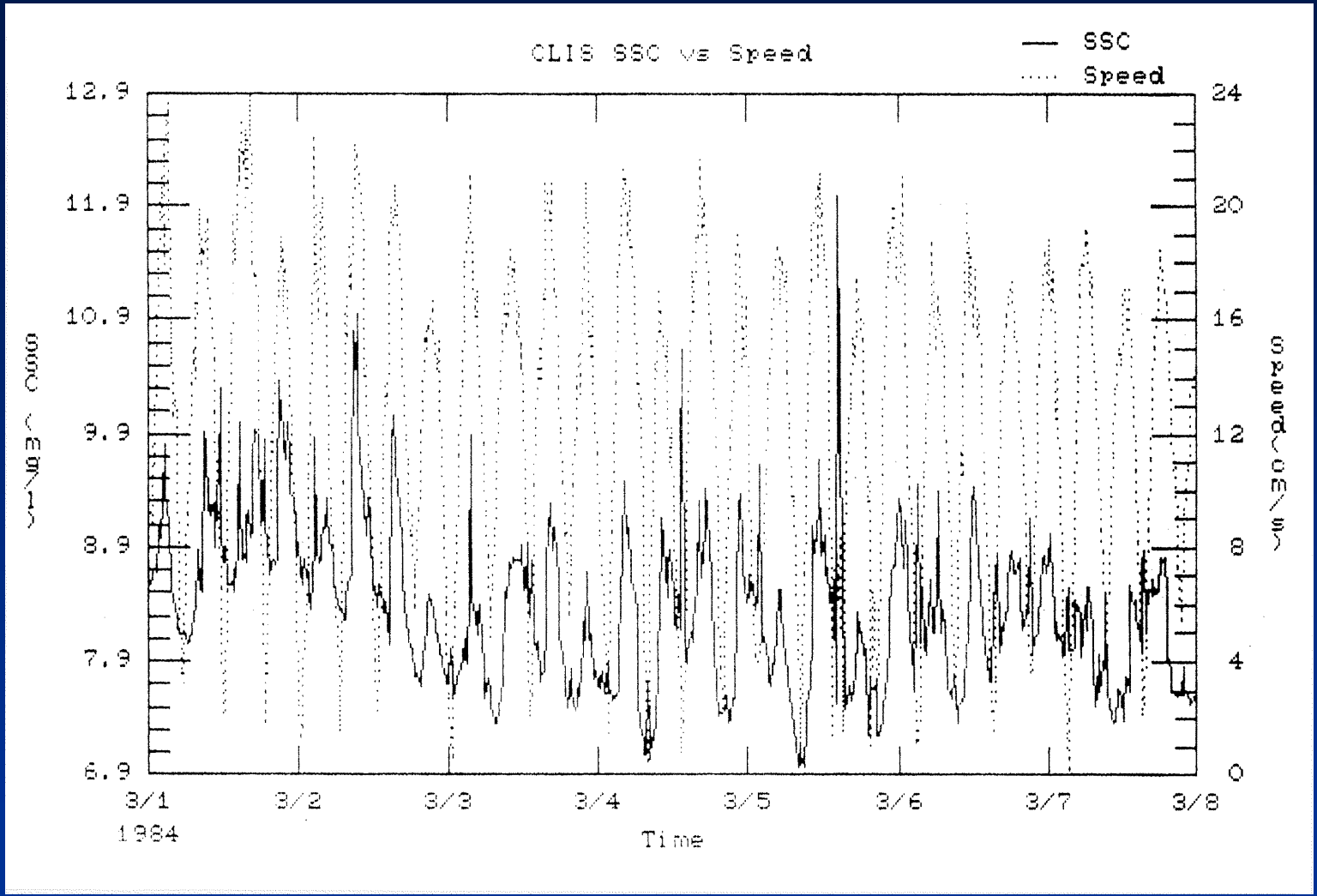


**Western**
**Long Island Sound**

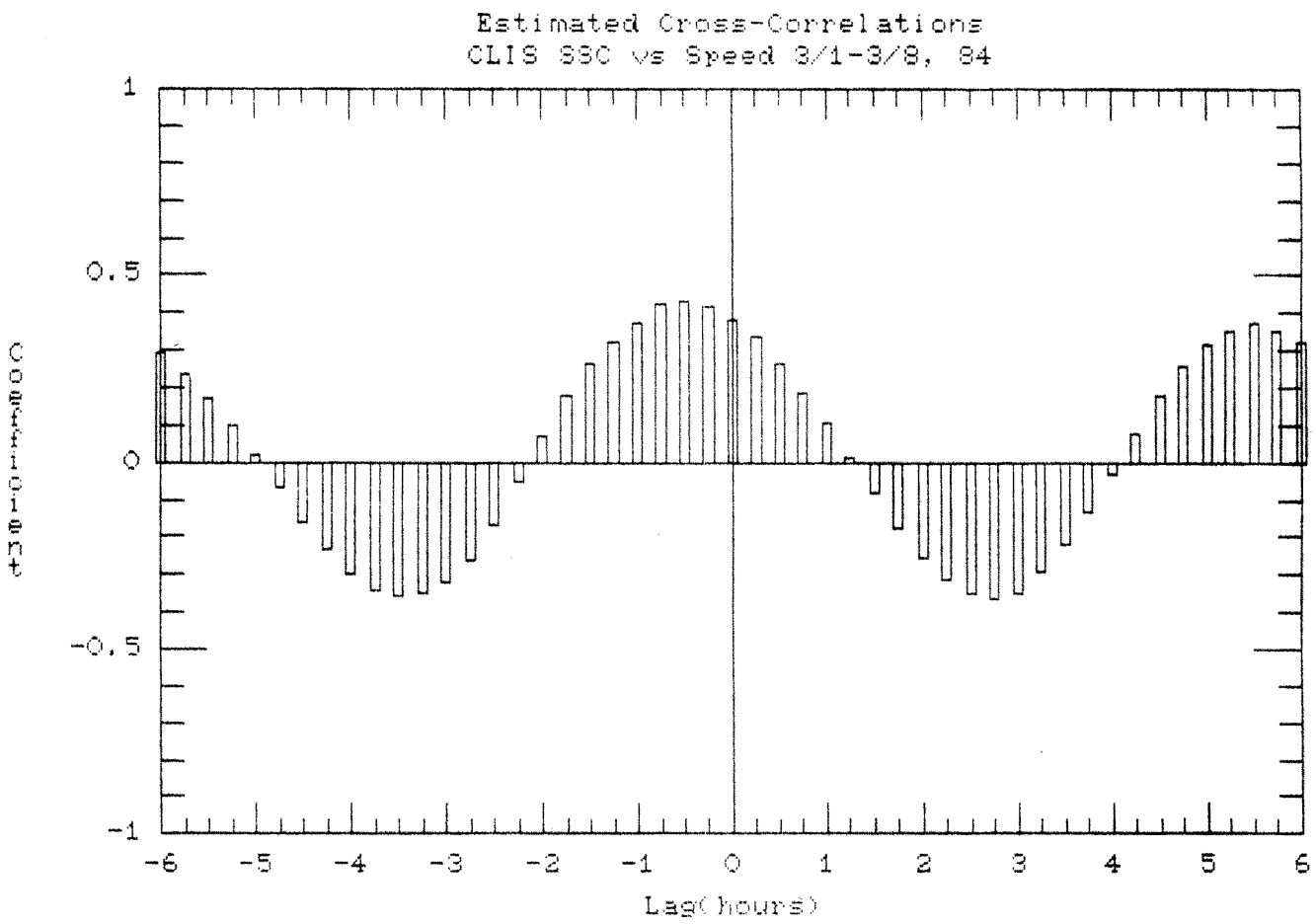
**March 13-20, 1987**



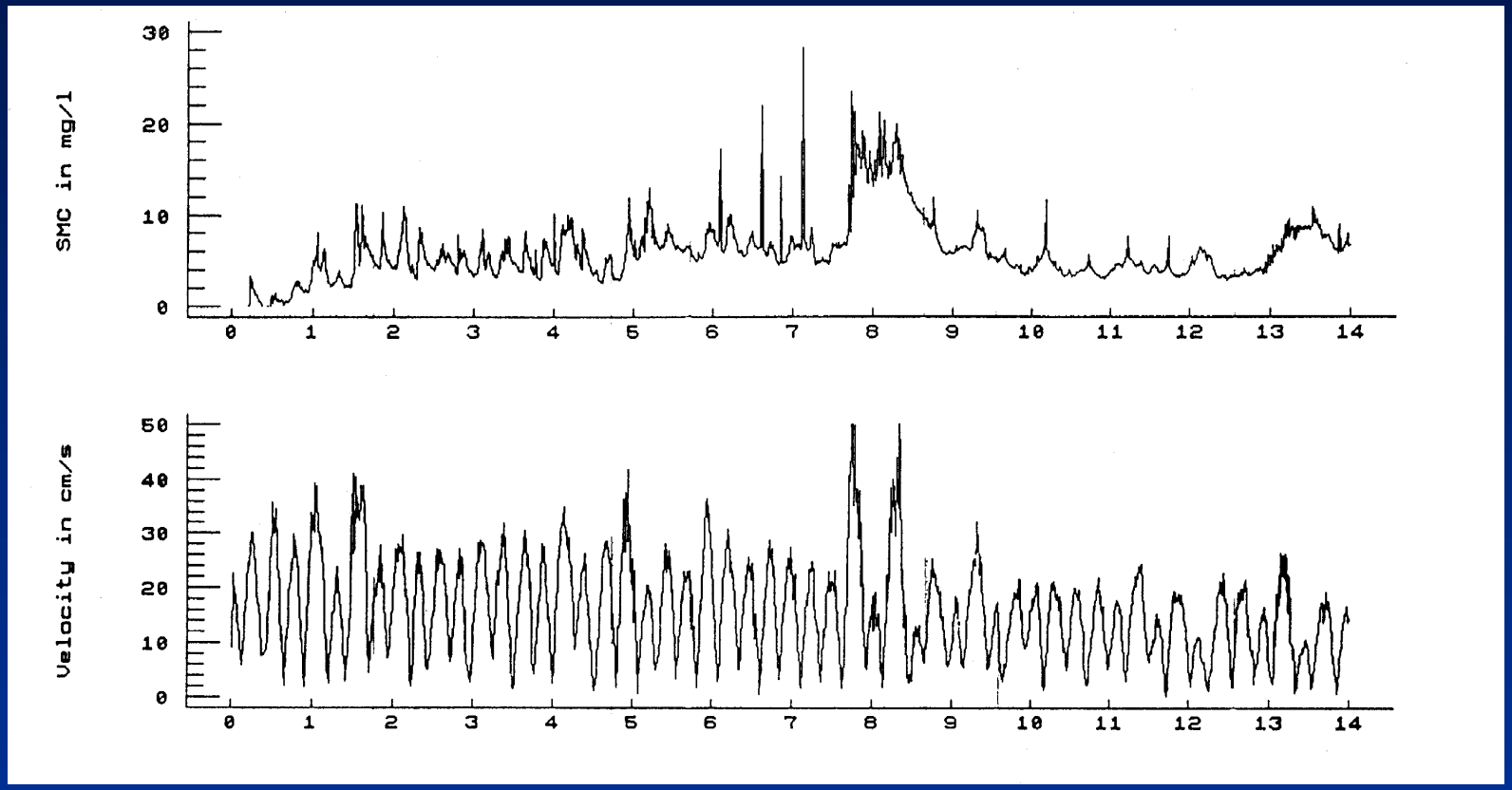
# Central Long Island Sound : March 1 - 8, 1984



# Central Long Island Sound : March 1 - 8, 1984

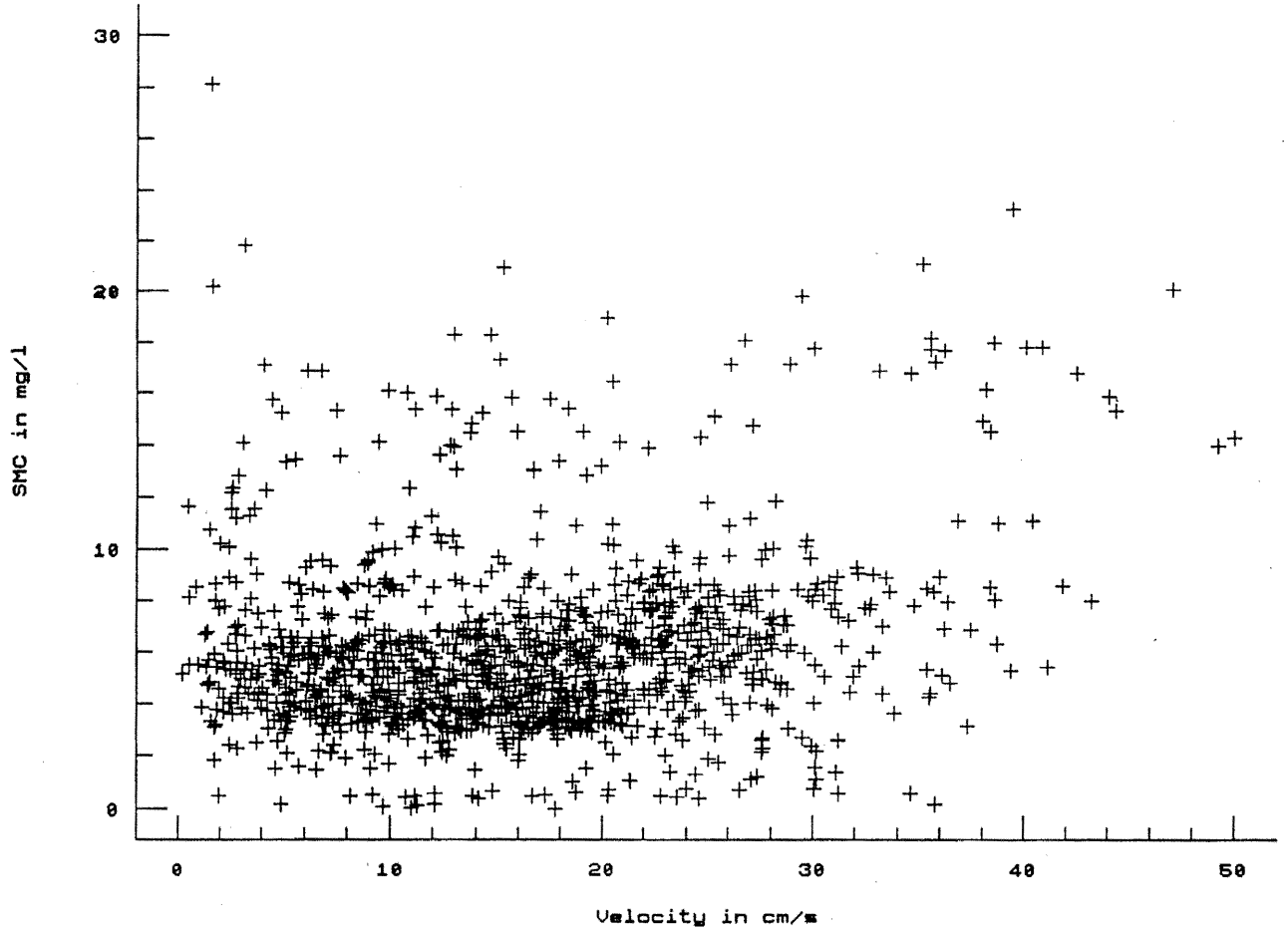


# NHD19: Nov 29 – Dec 12, 1983



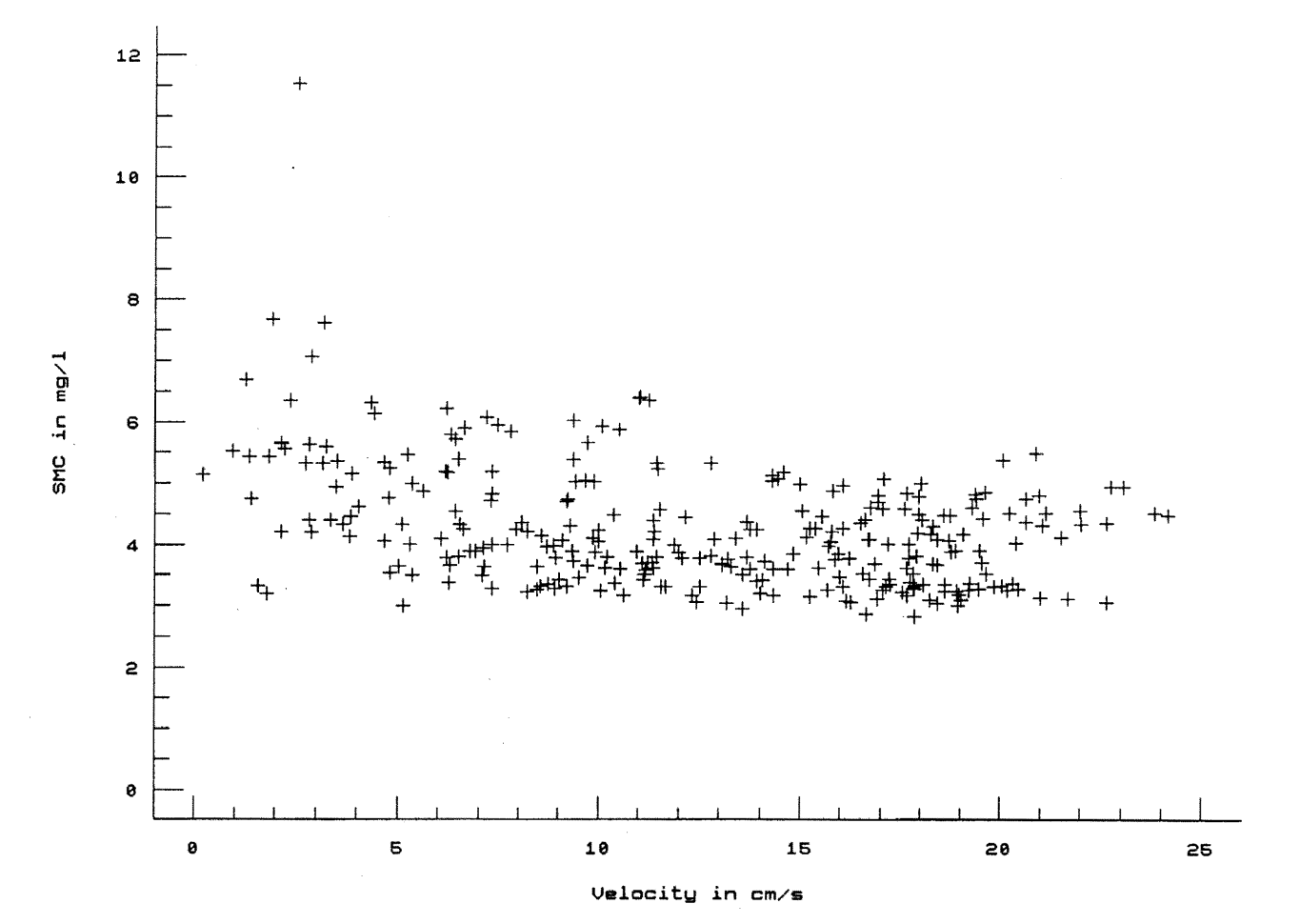
## NHD19: Nov 29 – Dec 12, 1983

all data



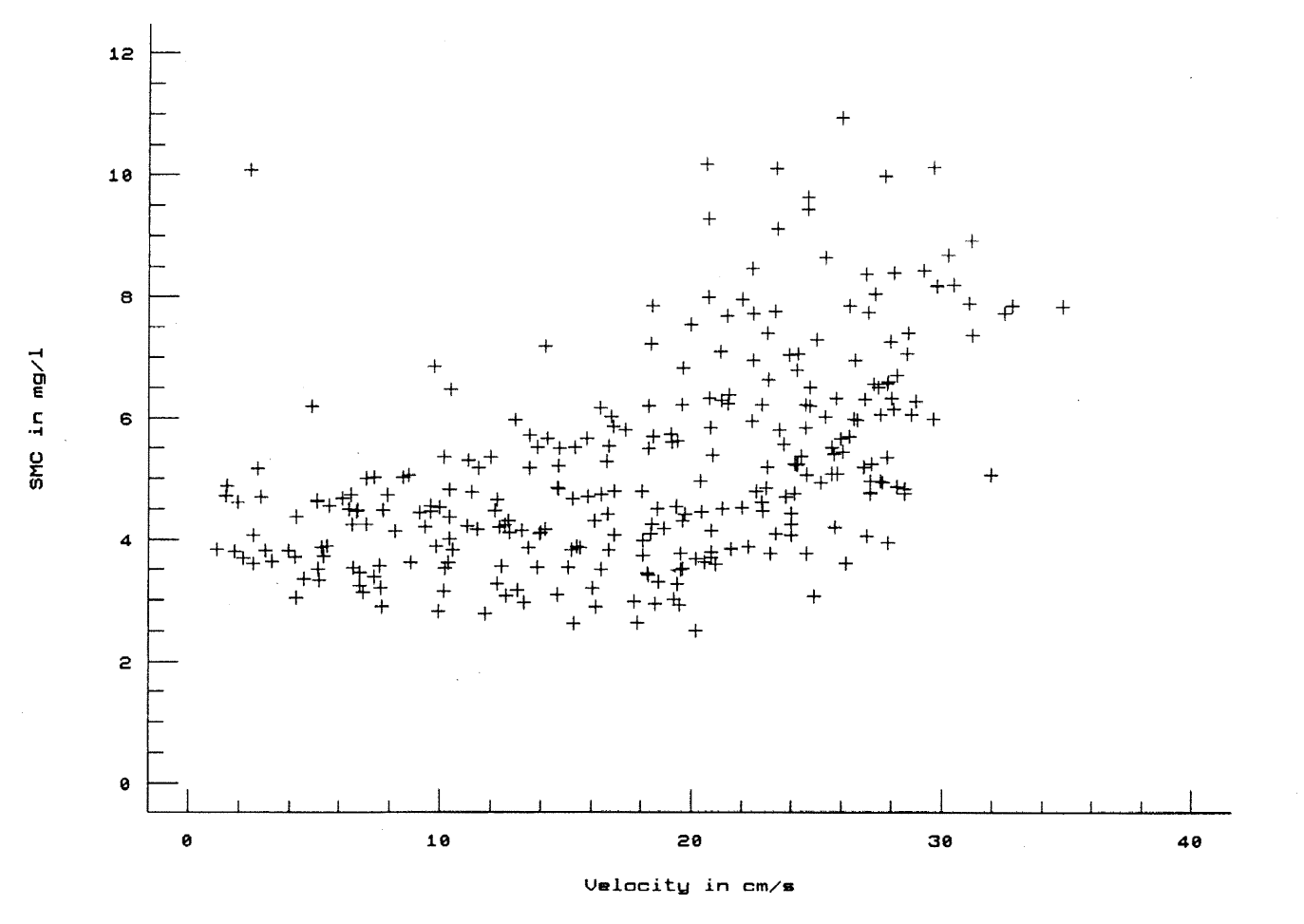
## NHD19: Nov 29 – Dec 12 , 1983

neap



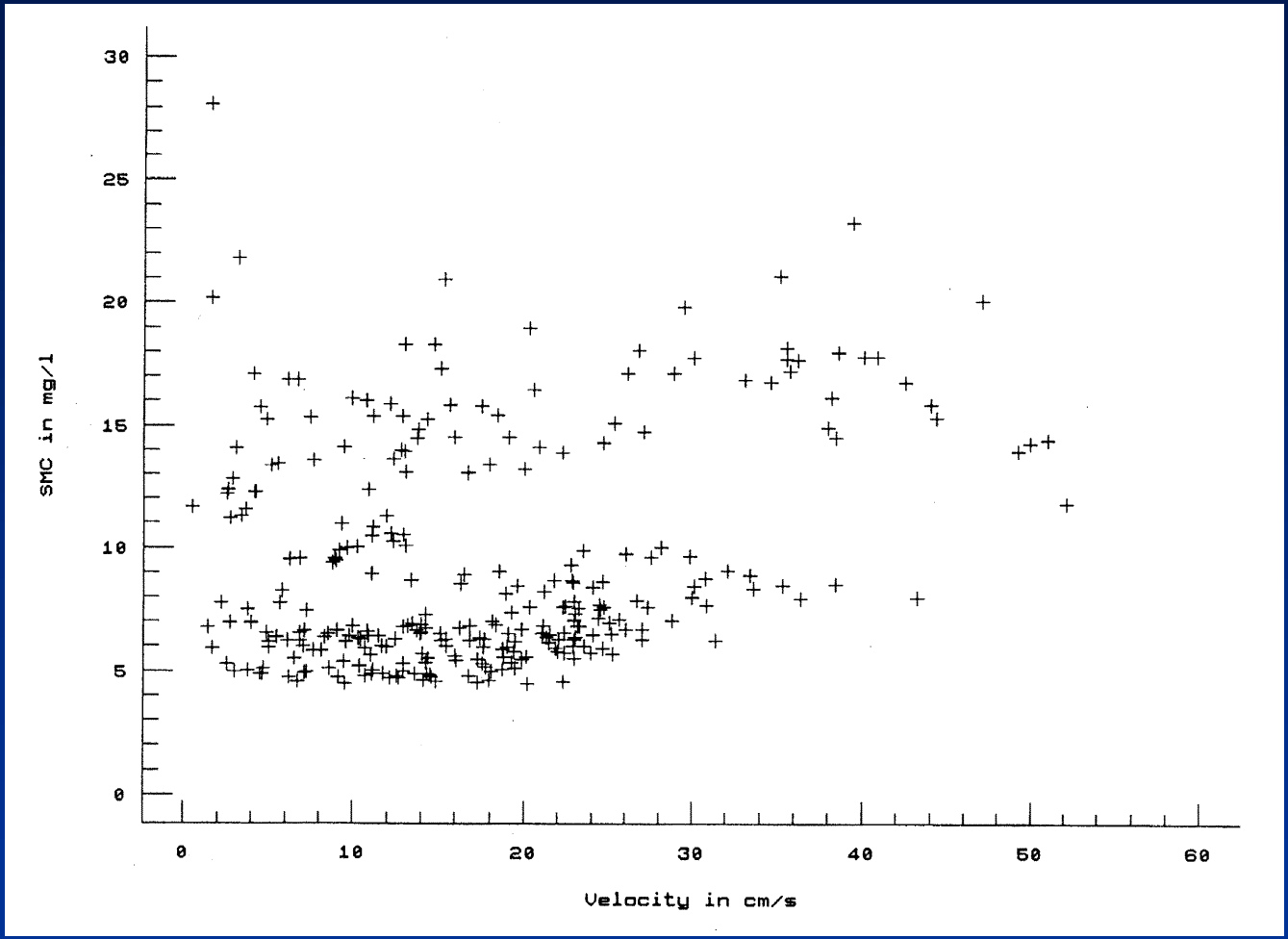
## NHD19: Nov 29 – Dec 12, 1983

spring



## NHD19: Nov 29 – Dec 12, 1983

storm



# Disturbance Depths

SMC = 50 mg/L

10 m water depth, 1 $m^2$

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| | |
|---|---|
| $\rho_b$ = 1.5 g/cc | $\rho_b$ = 1.027 g/cc |
| $\overline{Z}$ = 0.033 cm | $\overline{Z}$ = 0.049 cm |

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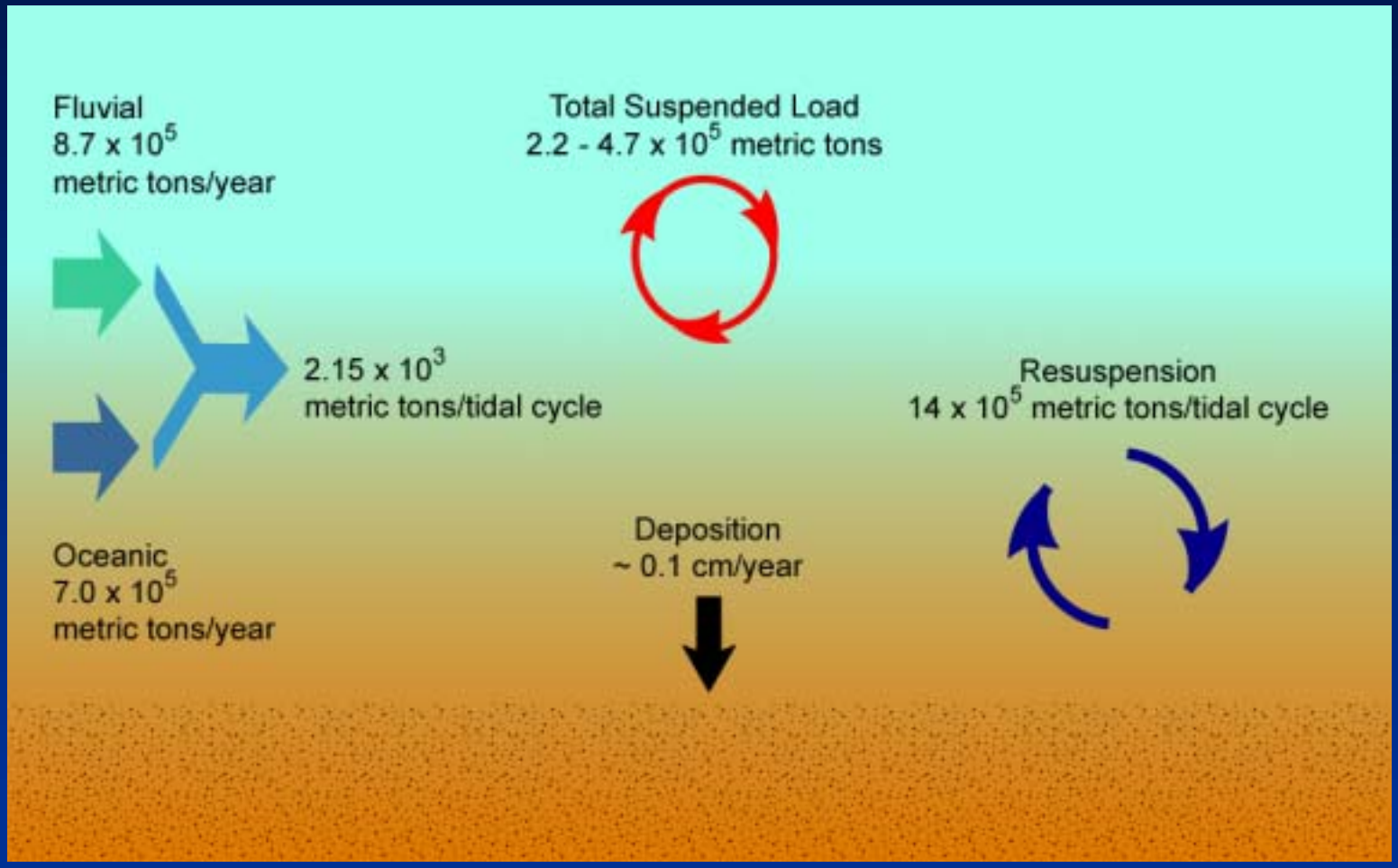
30 m ⟹ x 3

# Long Island Sound Sedimentary Regime




(Kim & Bokuniewicz, 1991)

# Conclusions

## Time Series Observations provide:

- A Unique (Essential) View of Sediment Transport Dynamics in Estuarine and Riverine Systems
- A Quantitative Means to Establish Exchange Processes Active Along and Across the Sediment-Water Interface
- A Direct Quantitative Measure of the Role of the Sediment Column as a Source/Sink for Contaminants