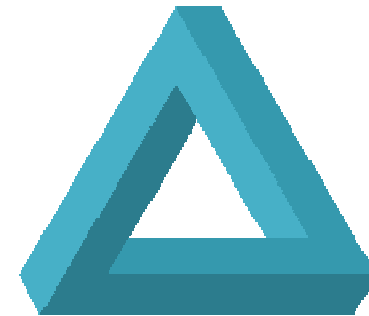




ACCURACY AWARENESS

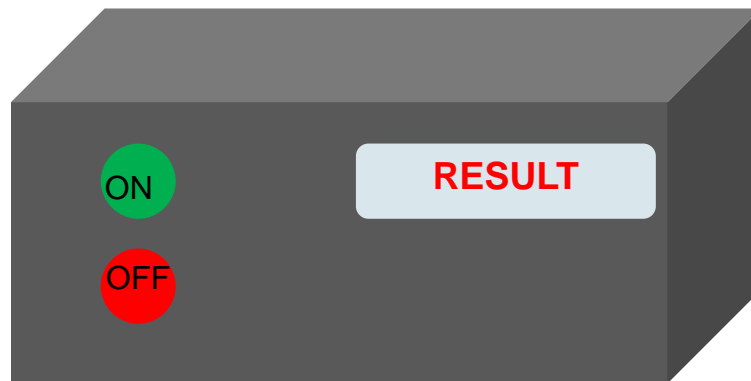
October 28, 2009

Jon Falkenberg
Petroleum Geo-Services



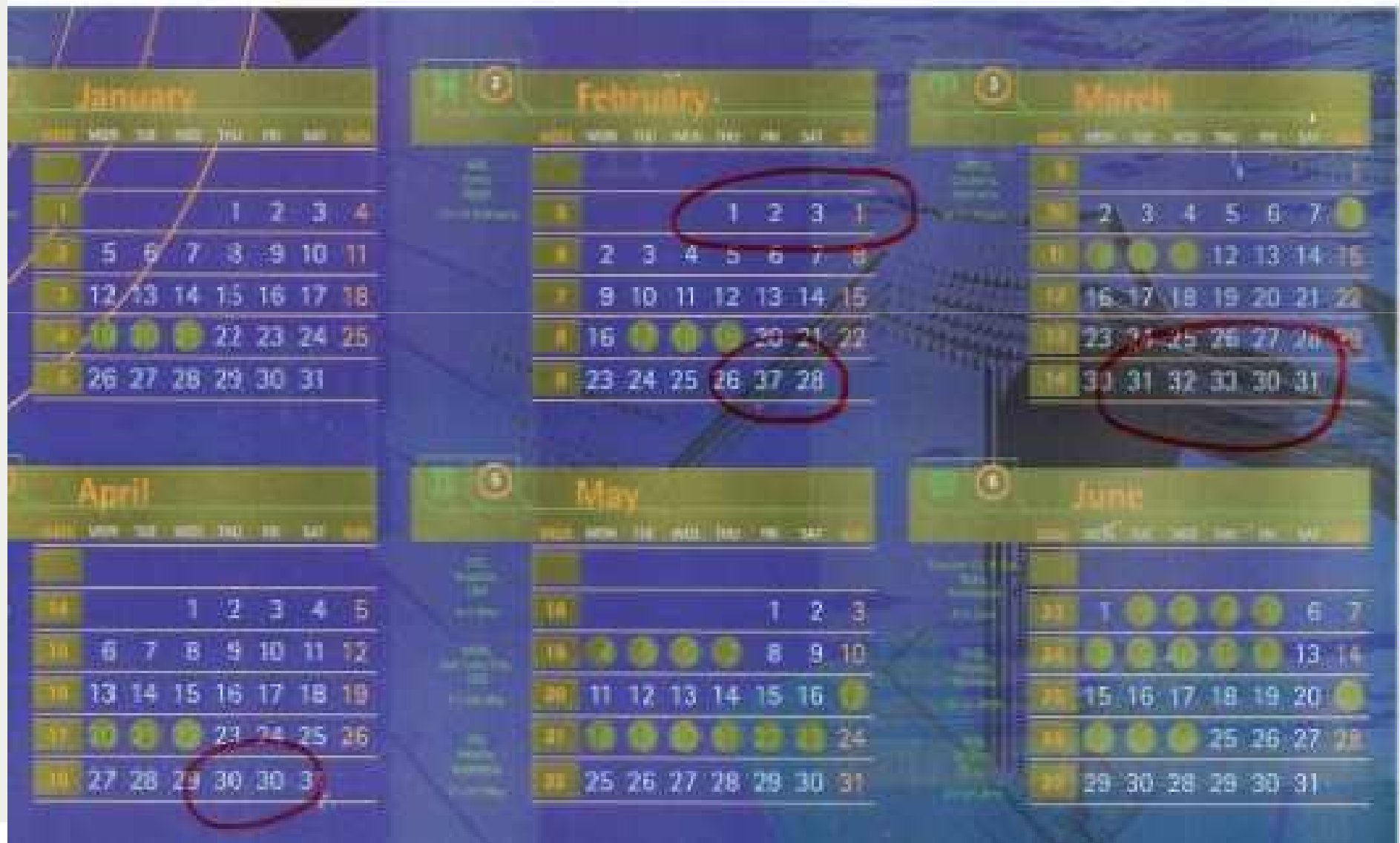
MODERN EQUIPMENT IS SIMPLE TO USE -

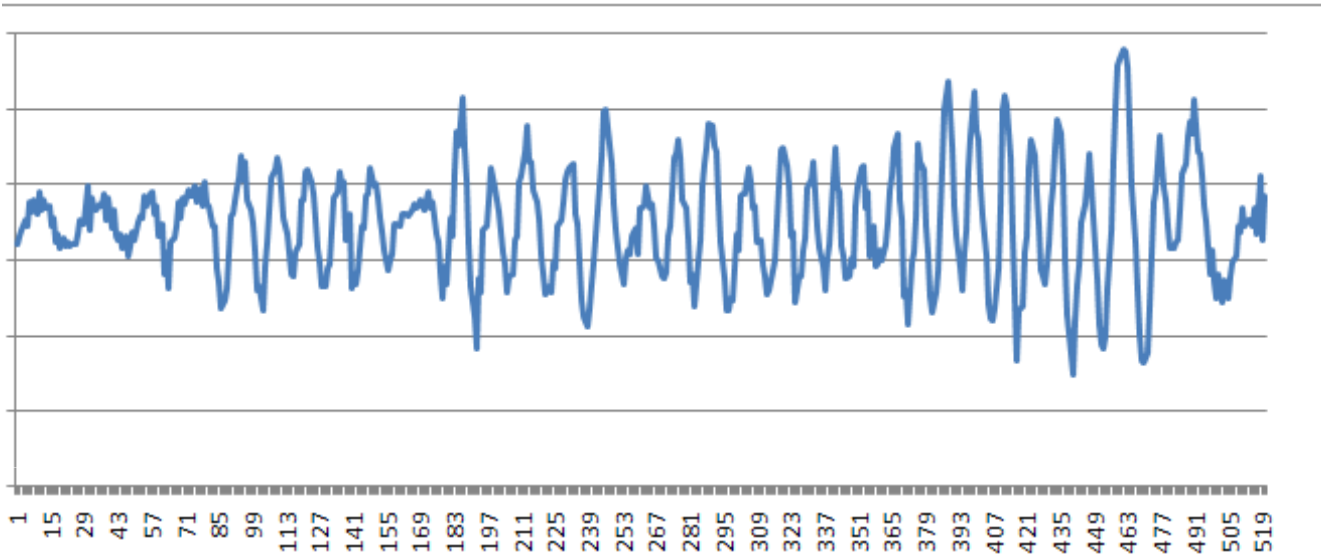
THAT IS WHY IT IS SO DIFFICULT TO GET
GOOD RESULTS



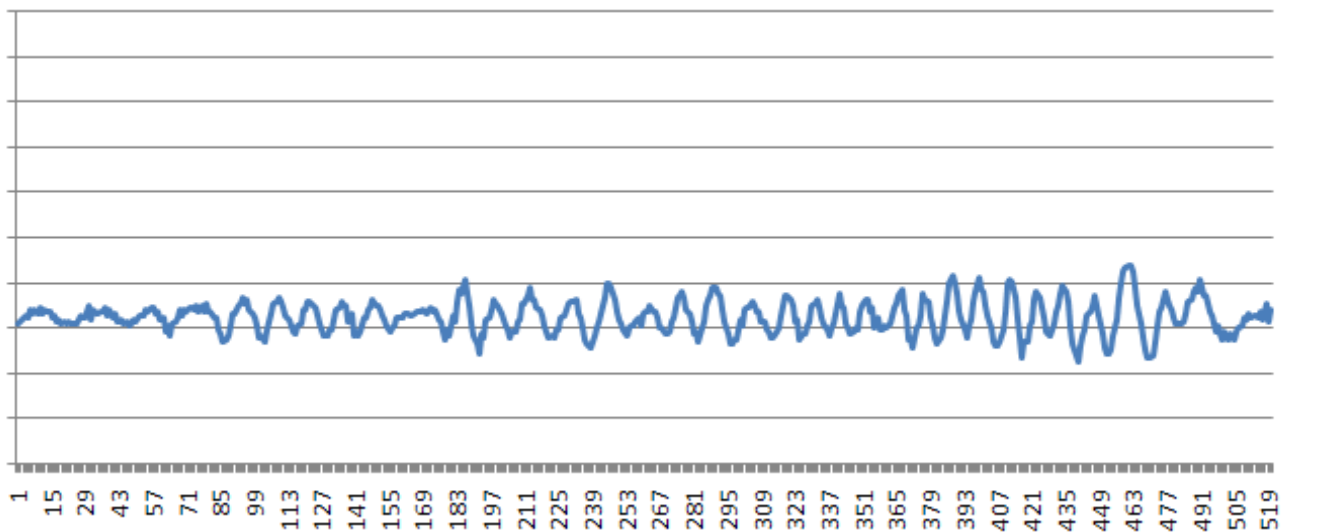


*GPS gave this
course*

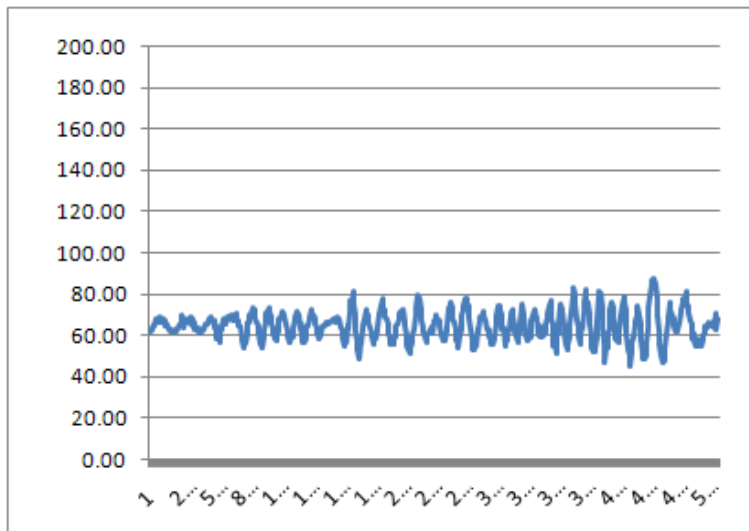
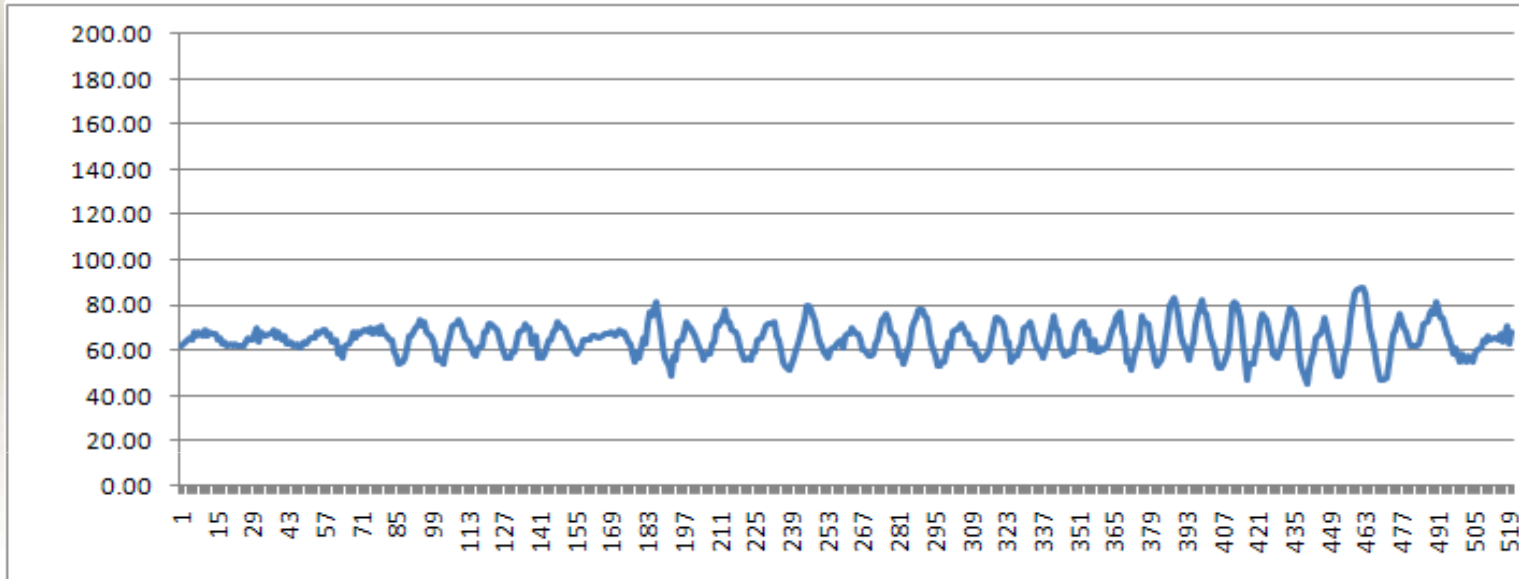




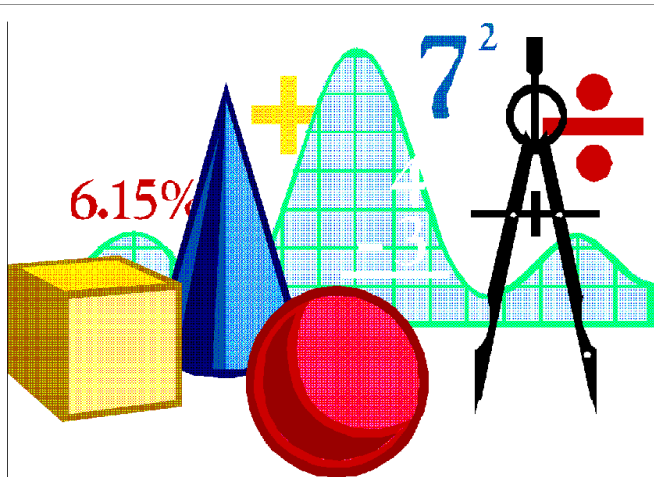
System A



System B



Darell Huff
HOW TO LIE WITH STATISTICS
New York 1954
ISBN 0393310728

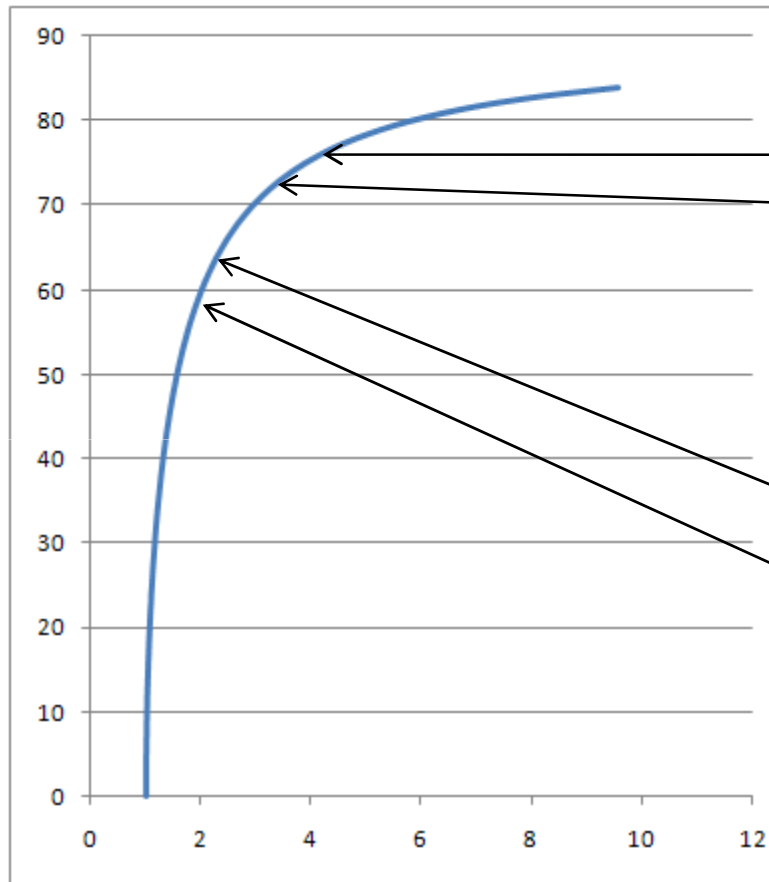




Nominal pipe length 15.3m
One mile 1609.344m

105.6 pipes pr mile

Revised pipe length: 15.3 +/- 0.5m

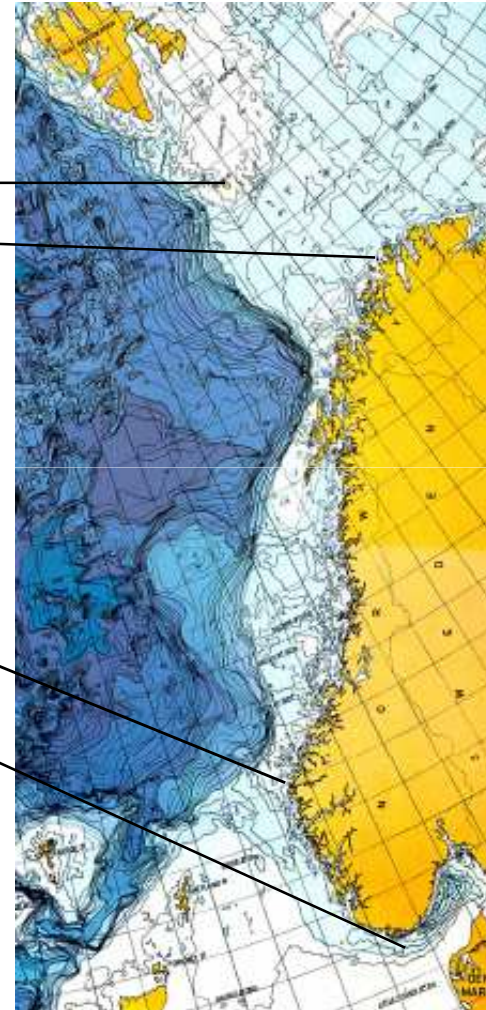


Bear Island

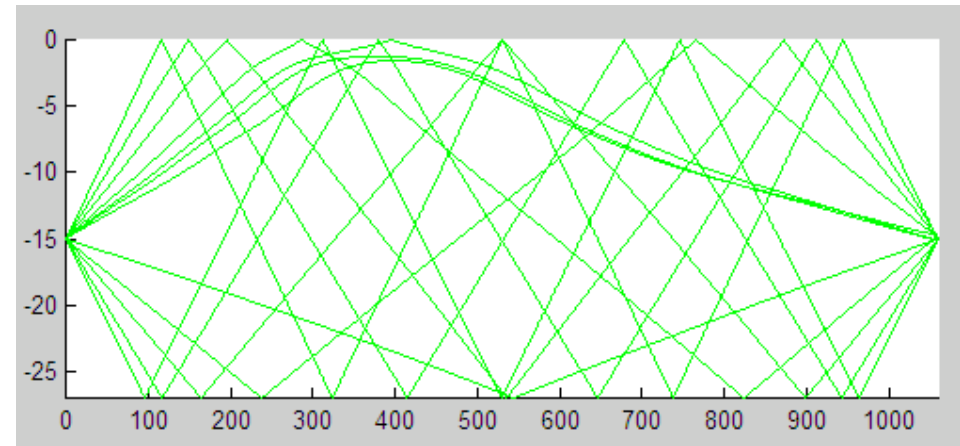
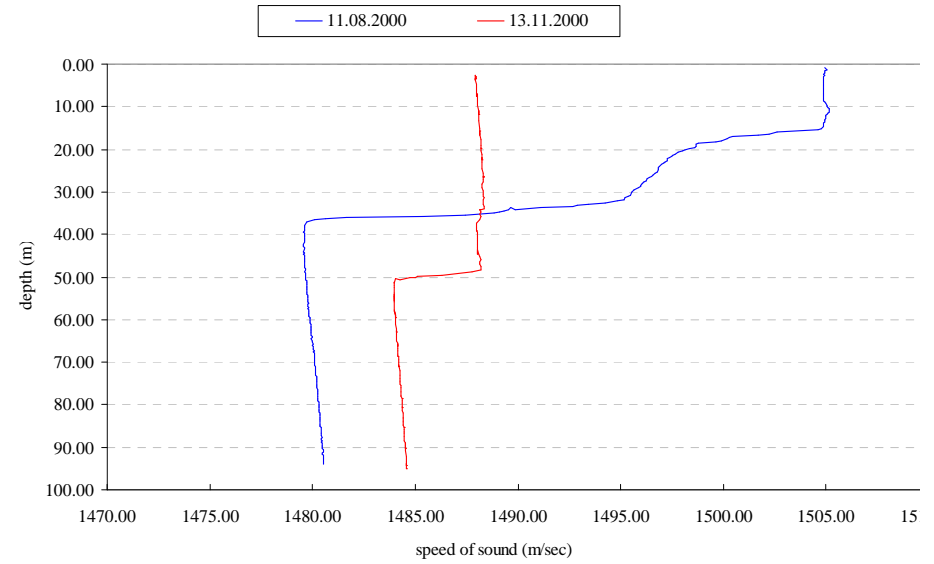
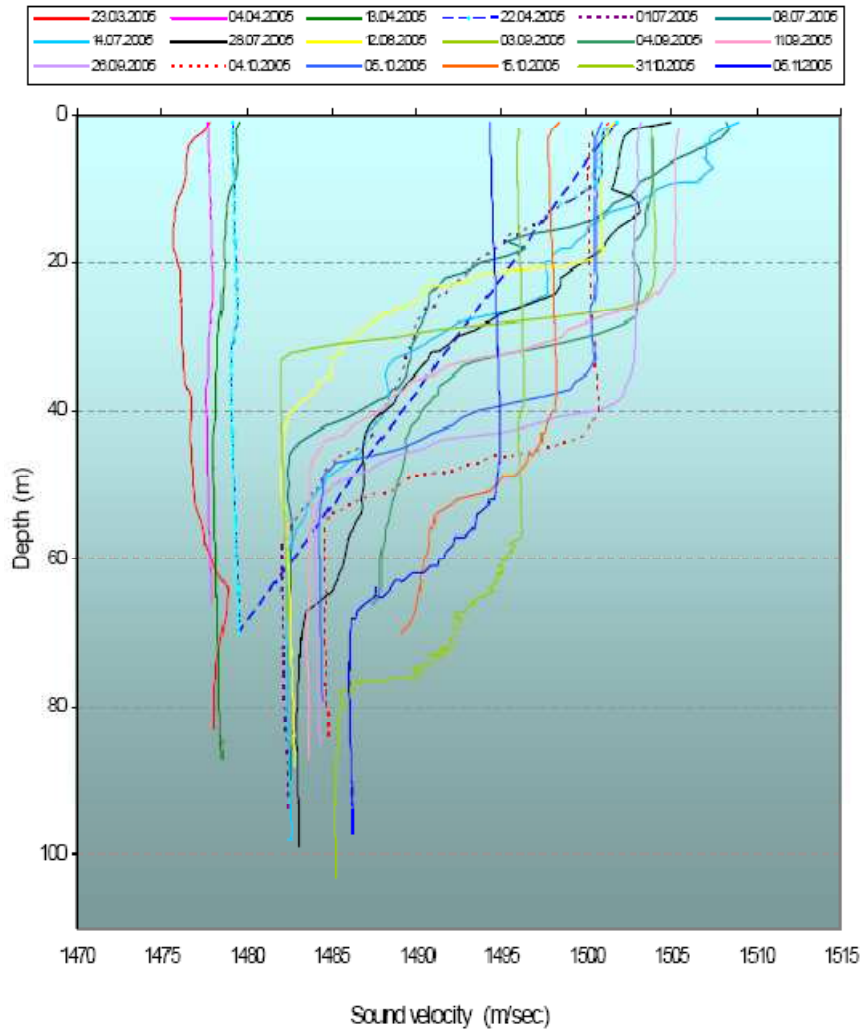
North Cape

Stadt

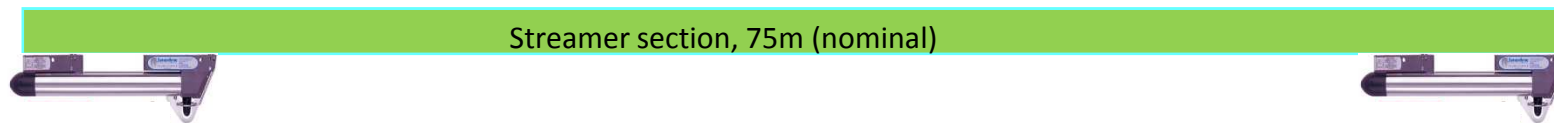
Lindenes



Sound Velocity Profiles



Sound propagation precision 1.0 m/s require an observation accuracy of 5 cm (over 75 m)



Length of “relaxed” section, 74.536m +/- 0.03m

Precision of each transponder mounting - +/- 0.02m

Towed at 4 knots (10kN) - 0.18m longer

Towed at 5 knots (15kN) - 0.28m longer

Accuracy of Acoustic ranging +/- 0.15 m

Computers do what you tell them to do
- not what you want them to do.

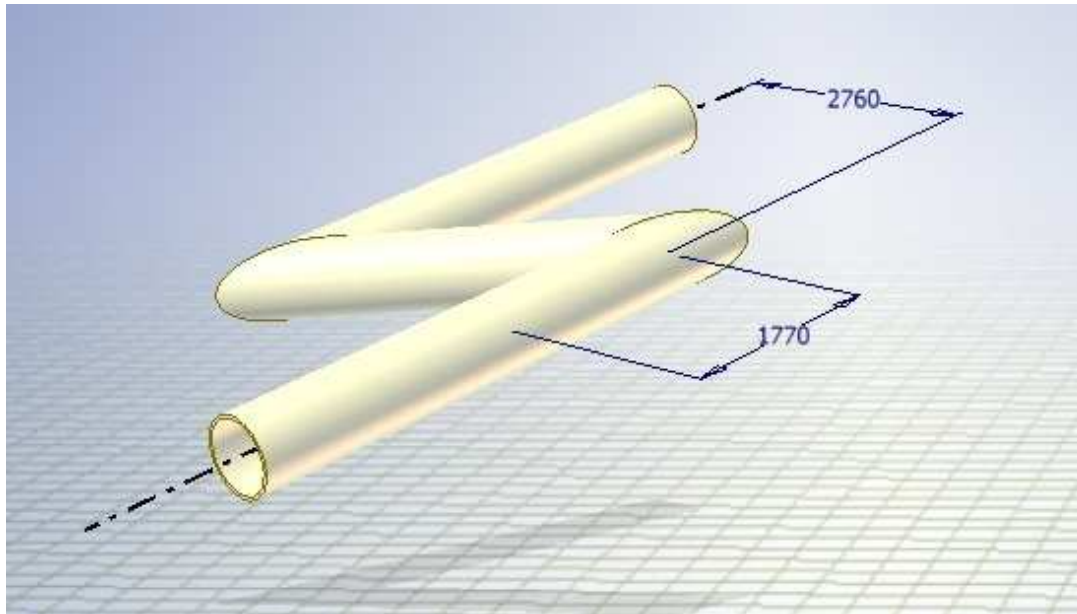
Modern
computers have
enabled
production of
erroneous
results at a so
far
unprecedented
speed

To err is human - to
really screw up you
need a computer



$$\begin{bmatrix} X \\ Y \\ Z \end{bmatrix} = \begin{bmatrix} X_0 \\ Y_0 \\ Z_0 \end{bmatrix} + (I + SF) \cdot \begin{bmatrix} 1 & RZ & -RY \\ -RZ & 1 & RX \\ RY & -RX & 1 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix},$$

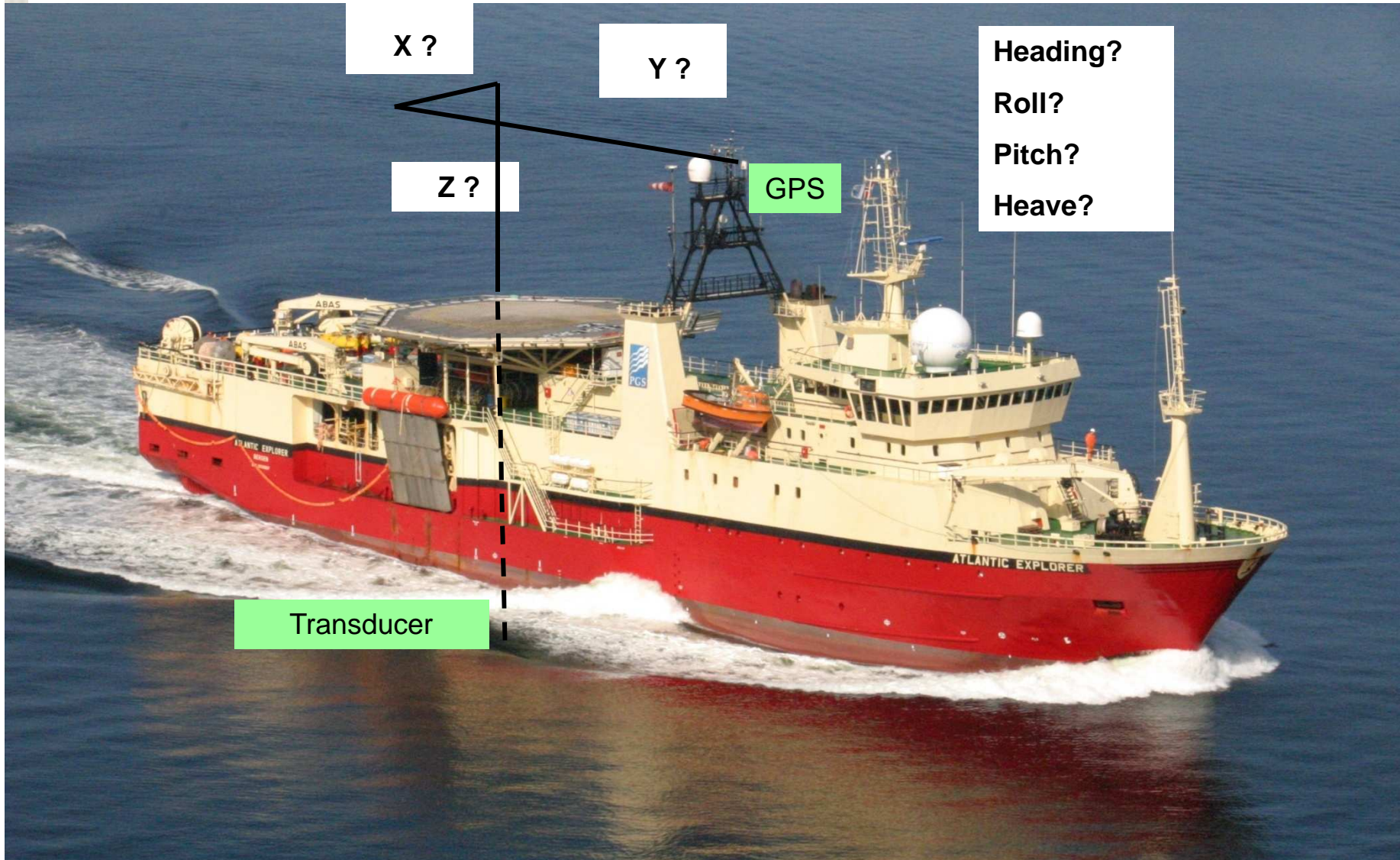
Helmerts tower
Potsdam
Fundamental point for
European Datum 1950

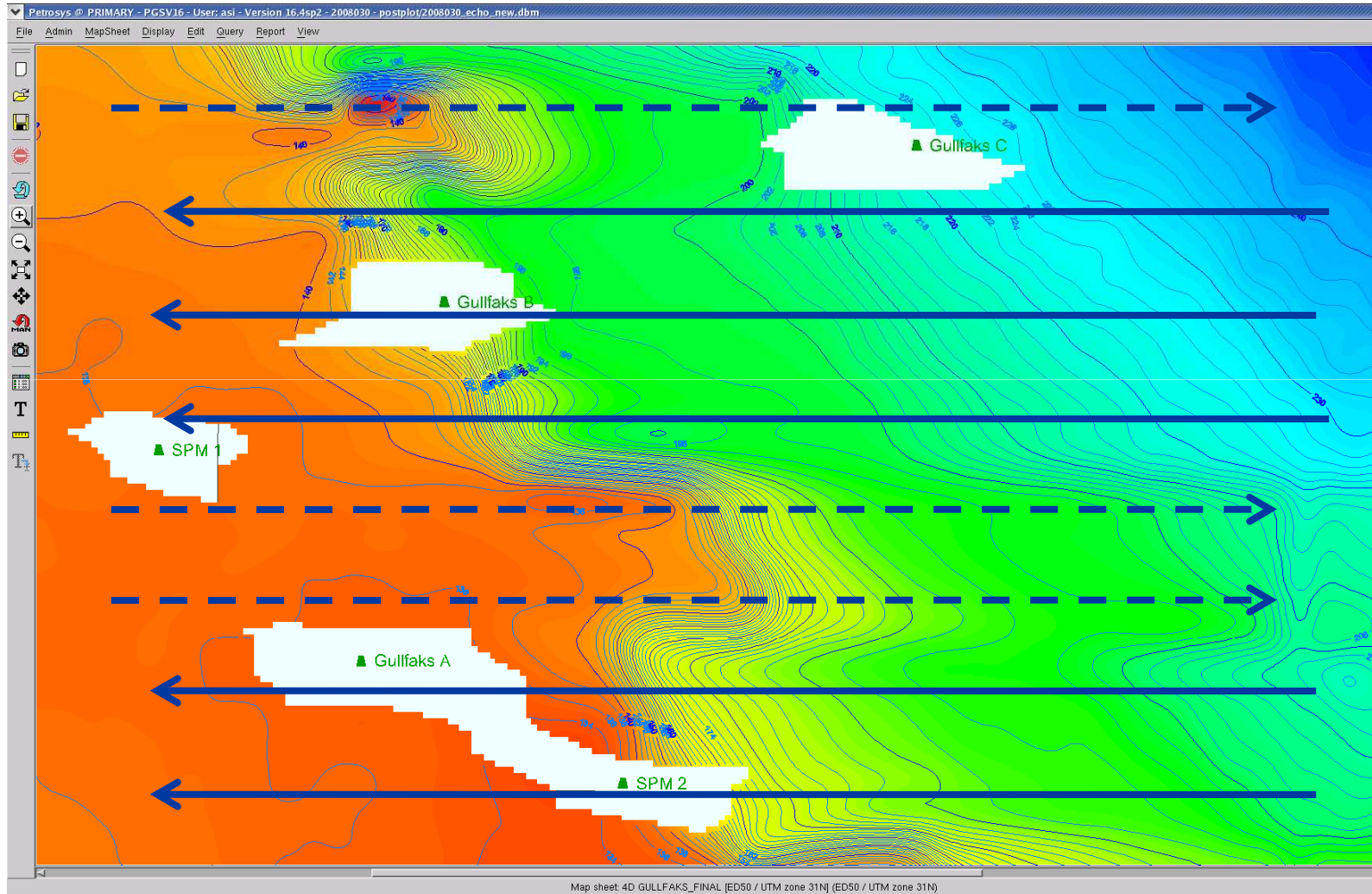


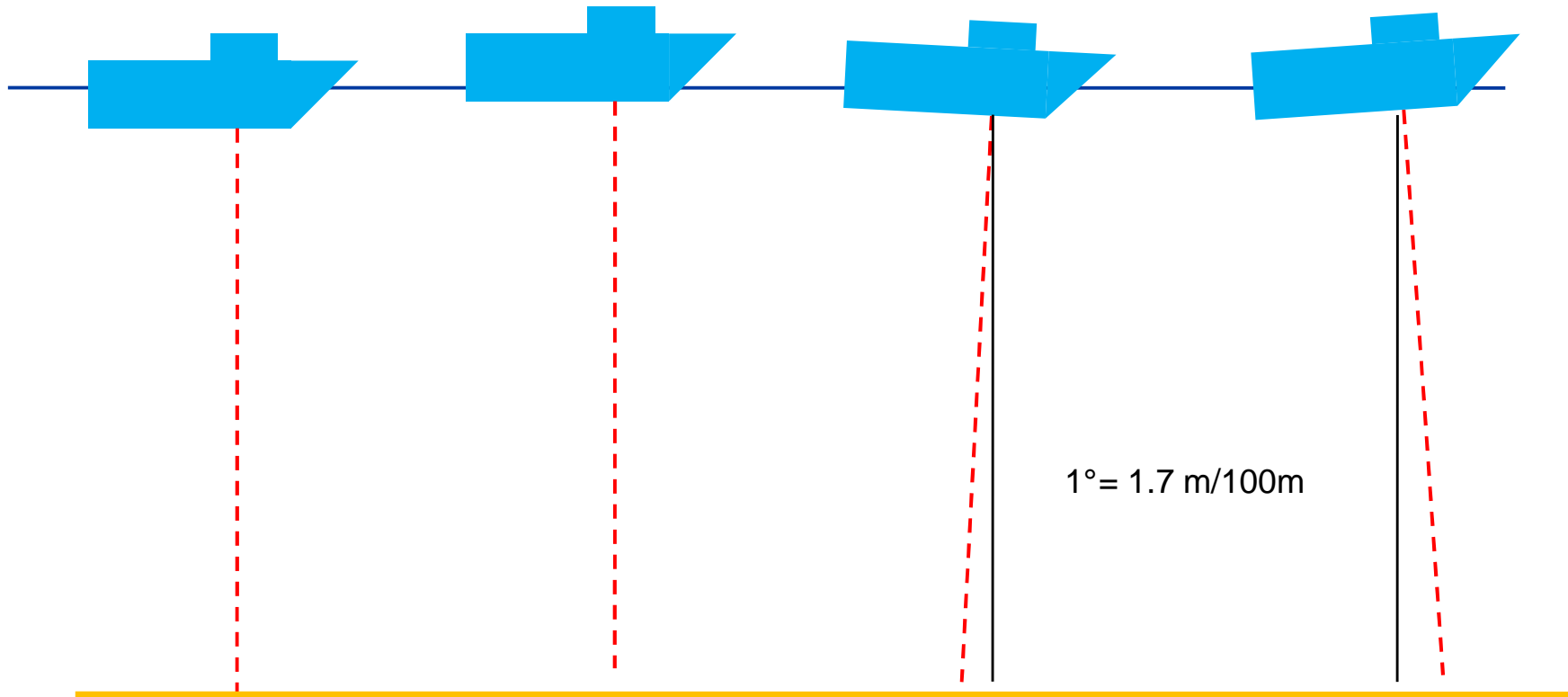
Construction drawing of
"Langeled" - crossing of 62nd
parallel.
Datum: ED-50

Result of un-calibrated MRU











Thank you for your attention