Marine

Observation of Strong Current Events in a Time Series of app. Eleven Years Conducted at the Baltic Coast off the Rerik Sea Resort, and their Impact on the Uncertainties of Surf and Coastal Current Forecasts

Military Goal

Relocatable Model Chain

Eleven Years Time Series (1997-2007) in EX - Area

Uncertainties due to Coastal Current Events

(Analysis right at the beginning, ongoing)

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Military Goal

Task

- NATIONAL REQ CINCGERFLEET
  AW, SpecOps, CrisisResponse,
  MCM Sediment Transport/Mine Burial
- NATO METOC LN Function
  RF Operation

SURF Modeling Capability Development

Capability to Forecast
Seestate/ Surf/ Coastal Currrent

Selection of Parameters:
max. and sig. Breakerheight;
Surf Zone Width; Breakertype;
Strength of Coastal Current; etc

Application:
Seestate/Surf/Coastal Current
for

EX Northern Coasts

- EX - Area: Baltic Sea
  Mecklenburg – W. Pomeranian Bight,
  Peninsula Wustrow/ Sea Resort Rerik

- Scenario: From a Submarine near the Coast
  unsersea diver will approach the Coast,
  from 10m depthline ca. 1km distance.
  (combat terrorism)

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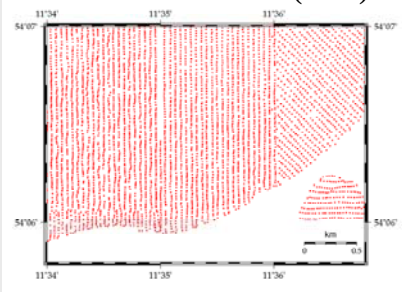
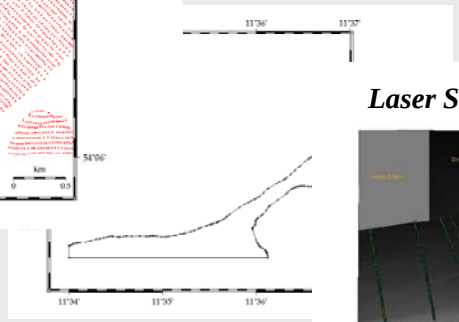
Relocatable Model Chain

Data: Bathymetrie/Coastline/Topographie

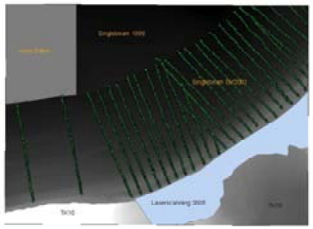
Echo Sounder Data (BSH)



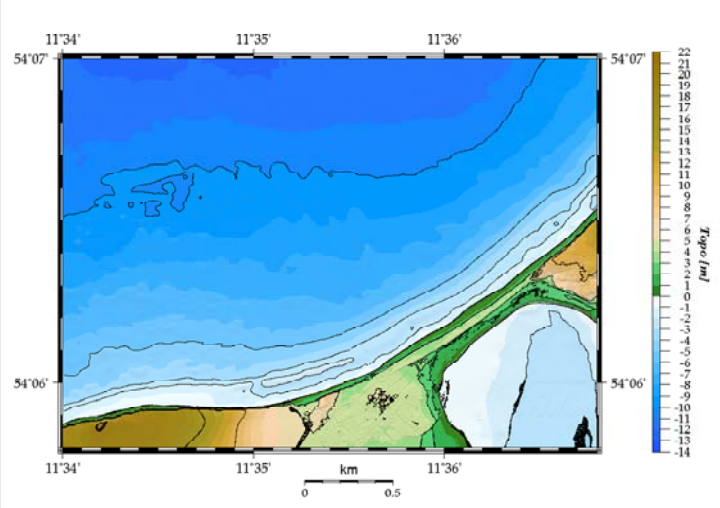
Coastline from ENC



Laser Scanning (StAUN)



Modelgrid: 1,5m Resolution



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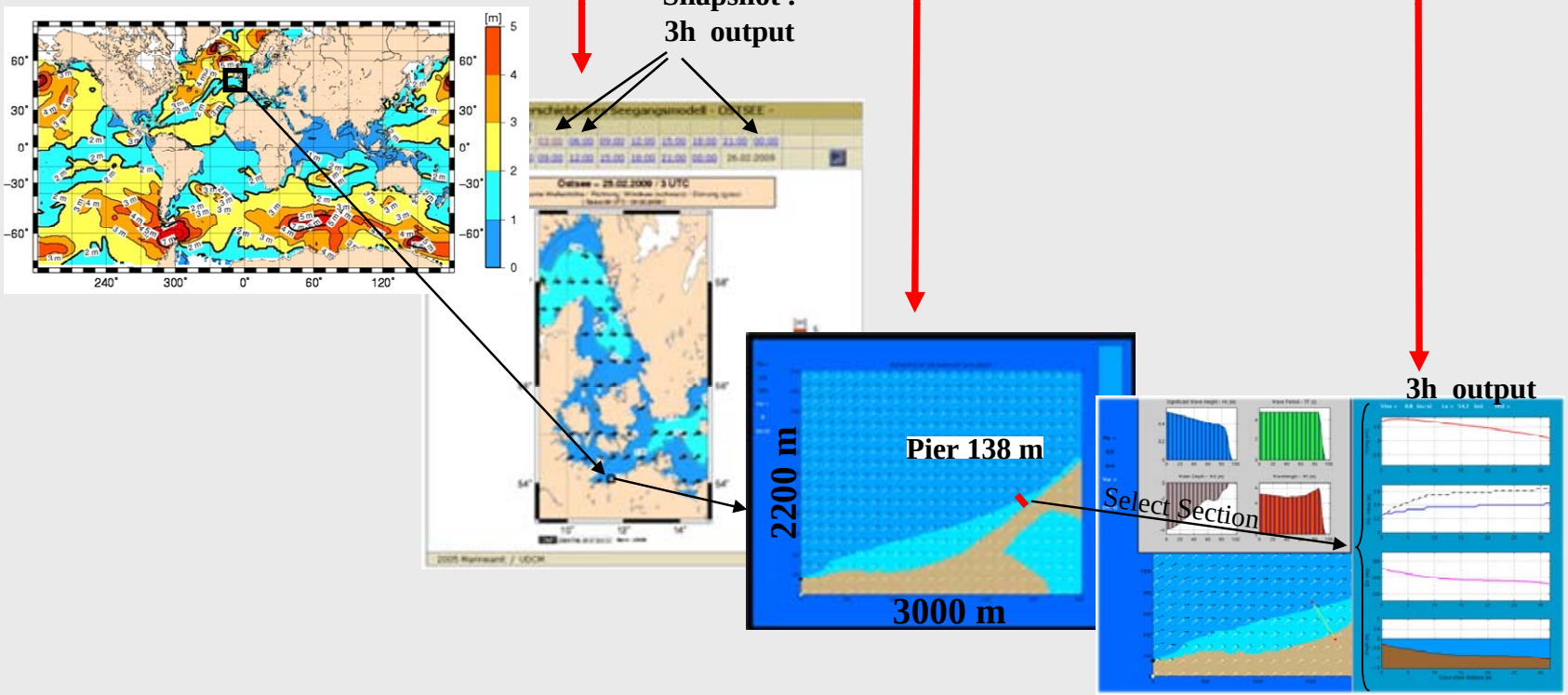
Relocatable Model Chain

Model Chain

GSM (40km) ➔ RSM (6km) ➔ SWAN (1-25m) ➔ SURF/NearCoM (1m)



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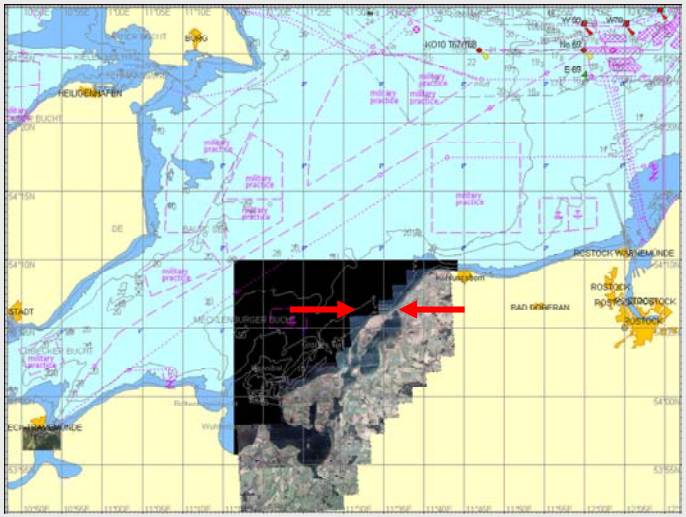
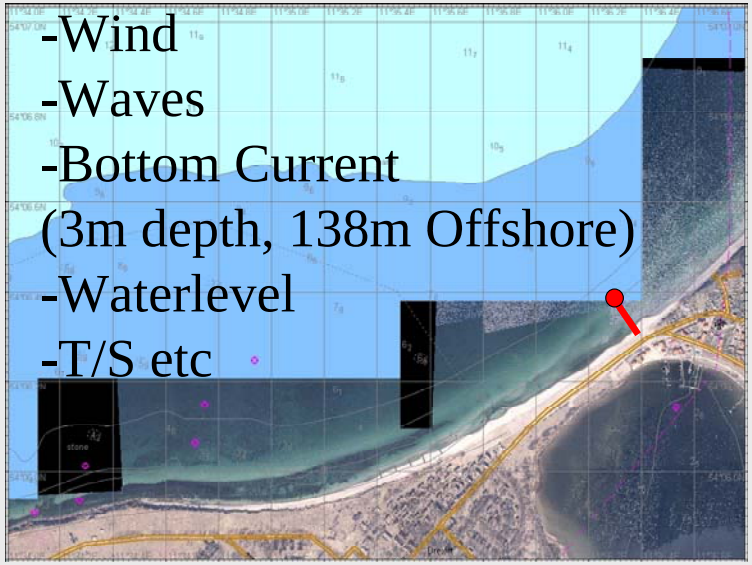
Eleven Years Time Series (1997-2007) in EX - Area

Location



Zoom In: The Pier, Multisensorplatform



-Wind
-Waves
-Bottom Current
(3m depth, 138m Offshore)
-Waterlevel
-T/S etc

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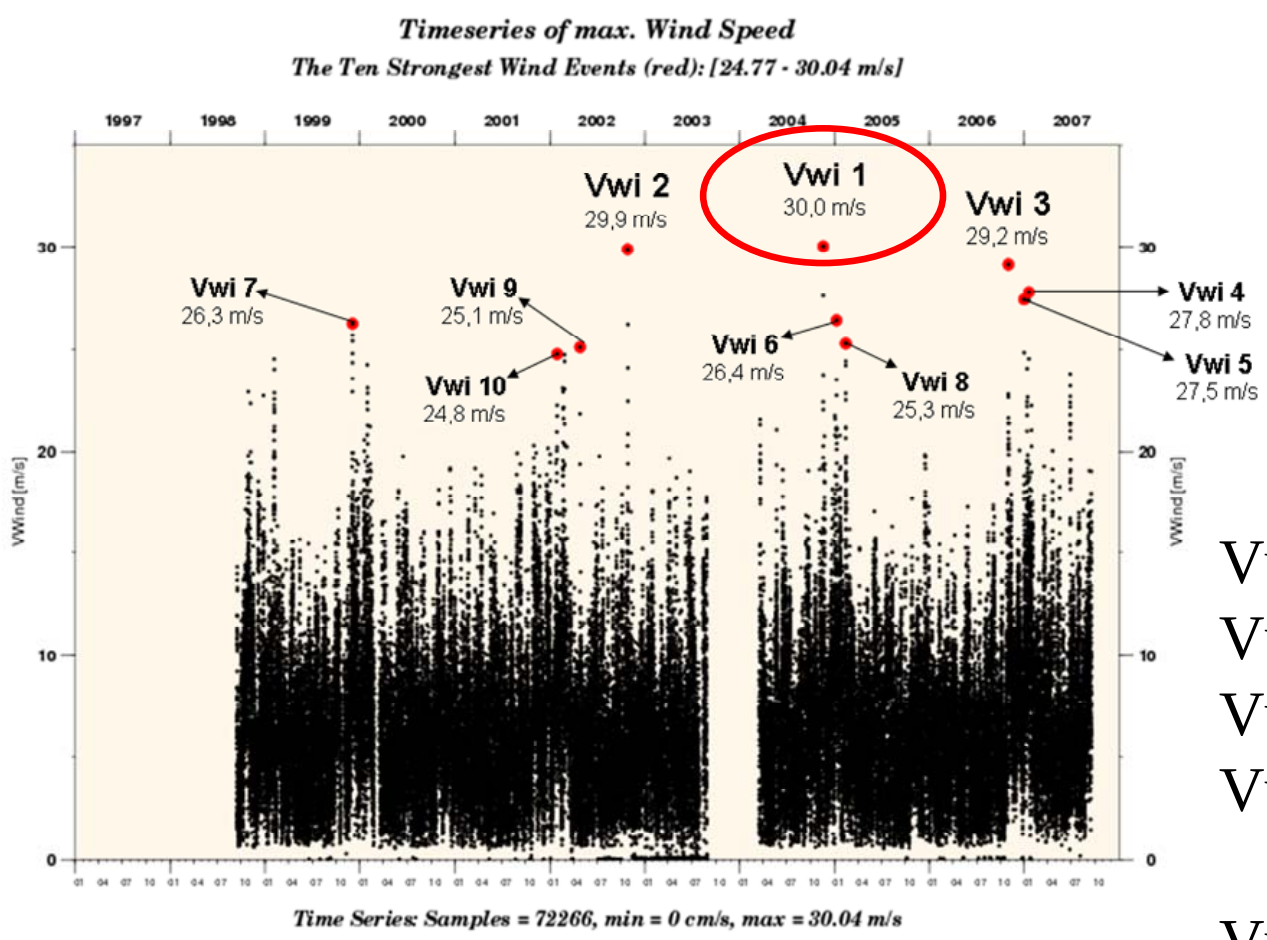
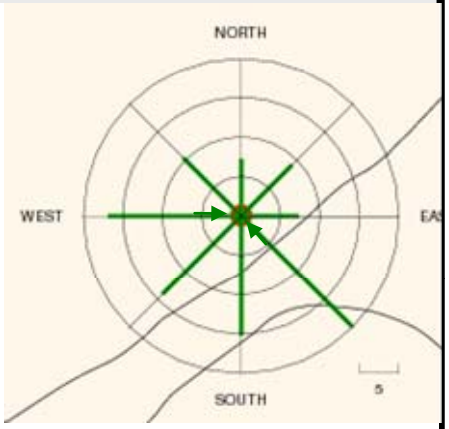
Wind





Bft 4

Vwi mean = 6.5 m/s

Vwi sigma = 3.5 m/s

Bft 11

Vwi max = 30.0 m/s

Vwi min = 0

Vwimax = 1.4 Vwi

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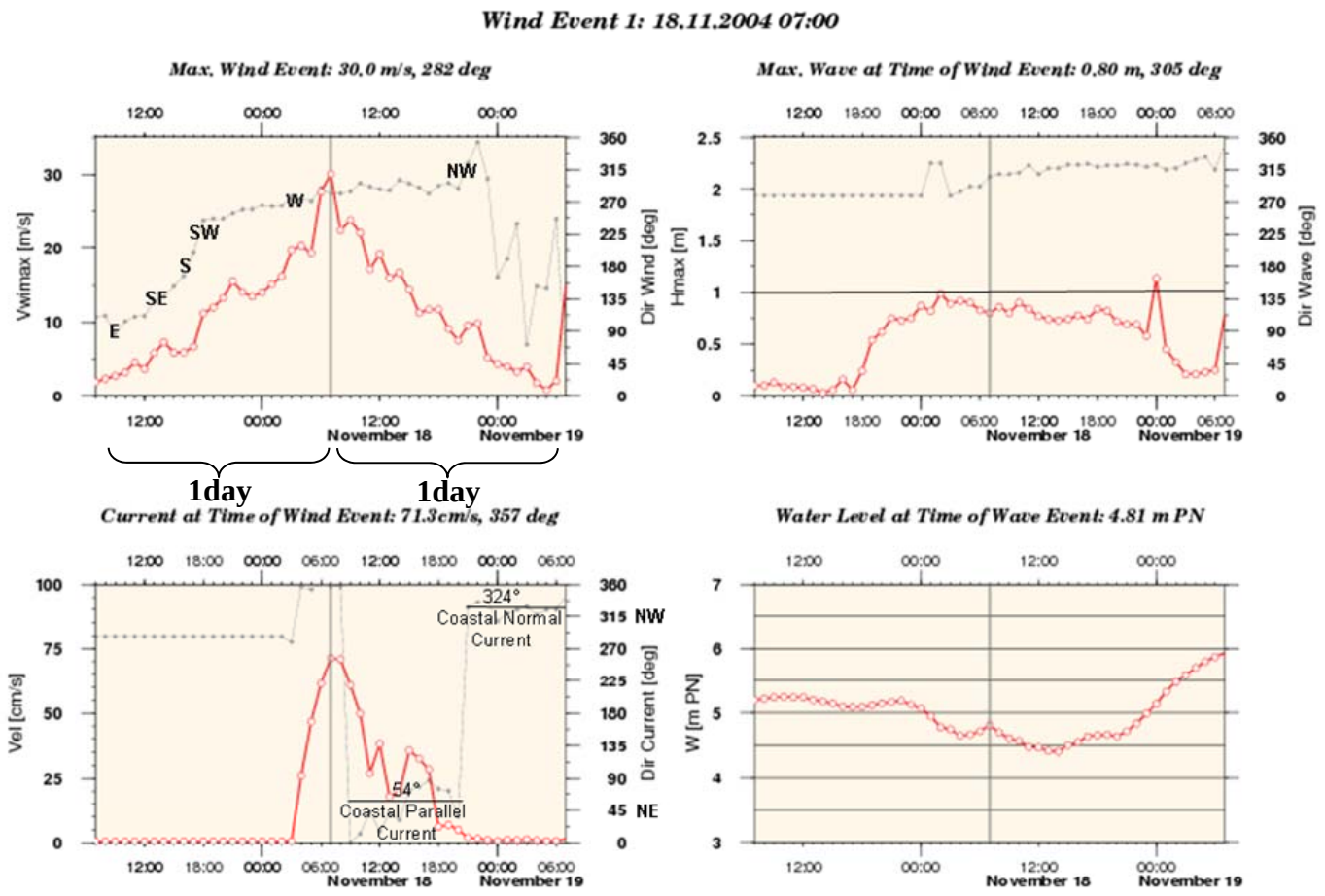
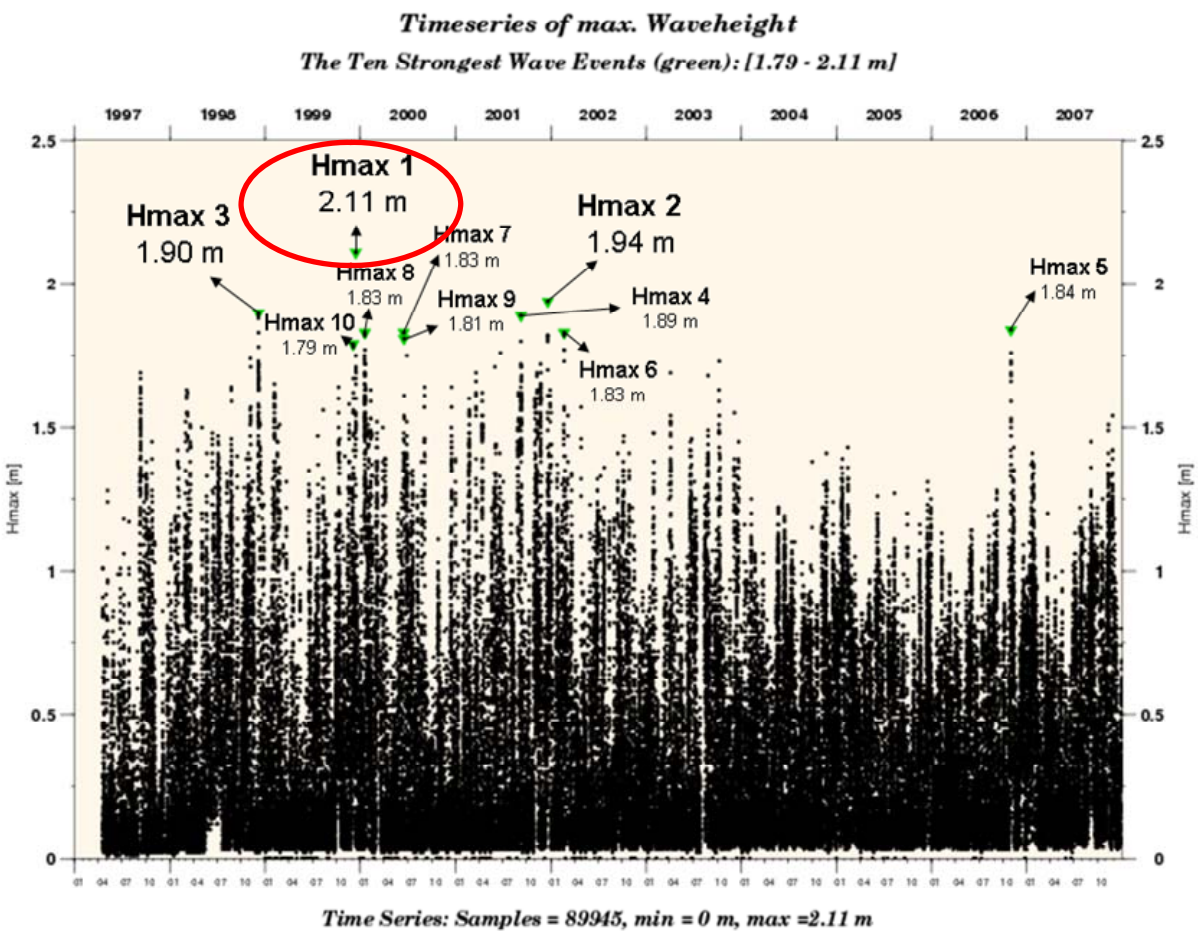
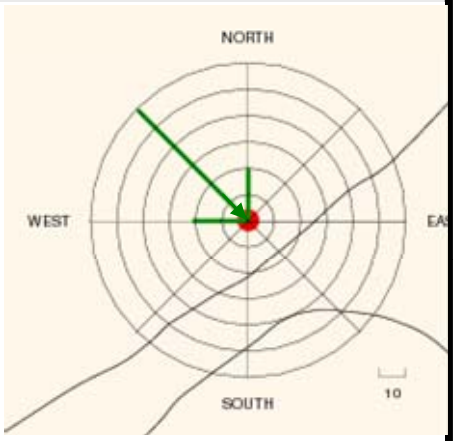
Strongest Wind Event (Vwi 1)



Waves





Hmax mean = 0.349m
Hmax sigma = 0.319m
Hmax max = 2.11m
Hmax min = 0

Hmax = 1.6 Hs

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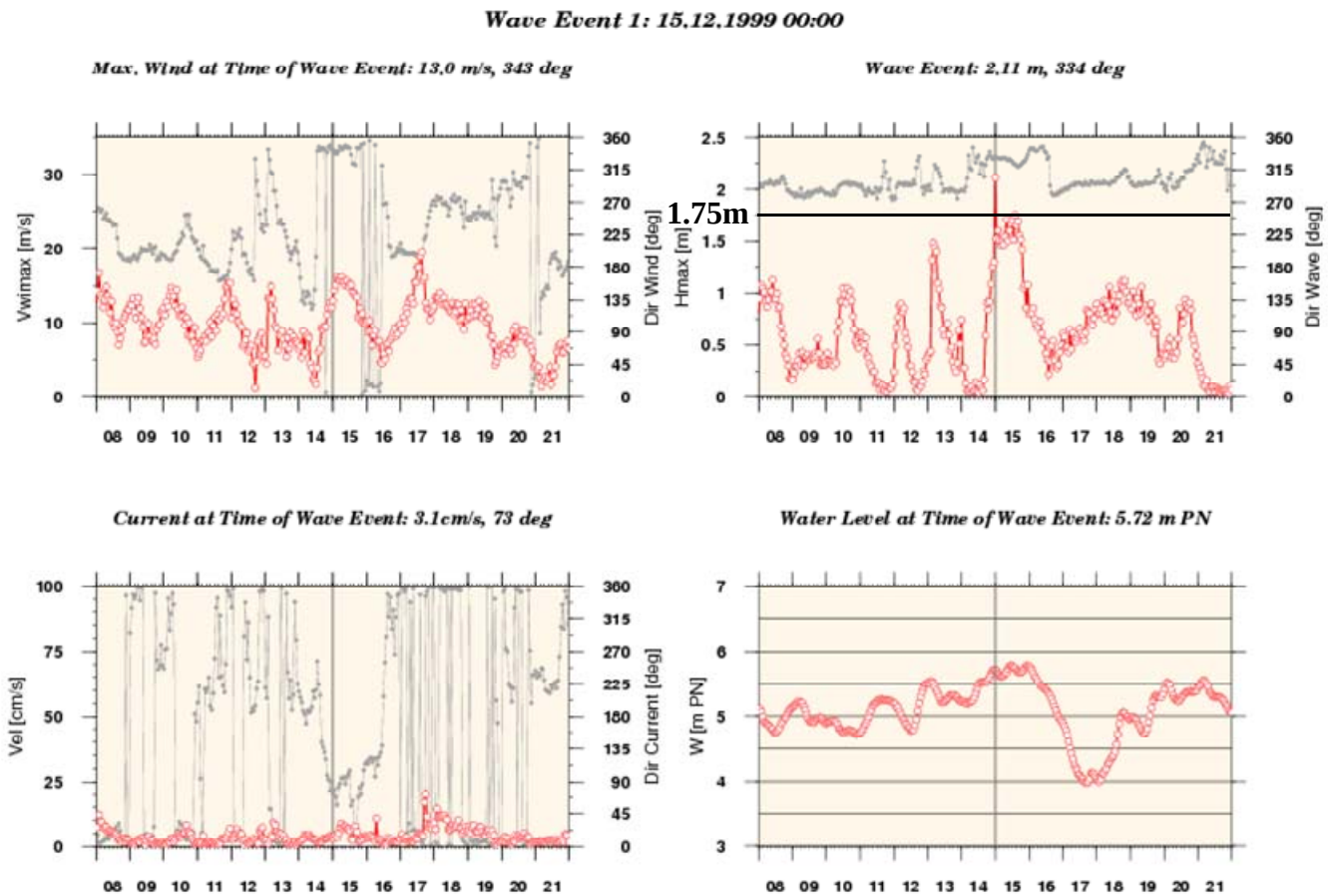
Strongest Wave Event (Hmax 1)



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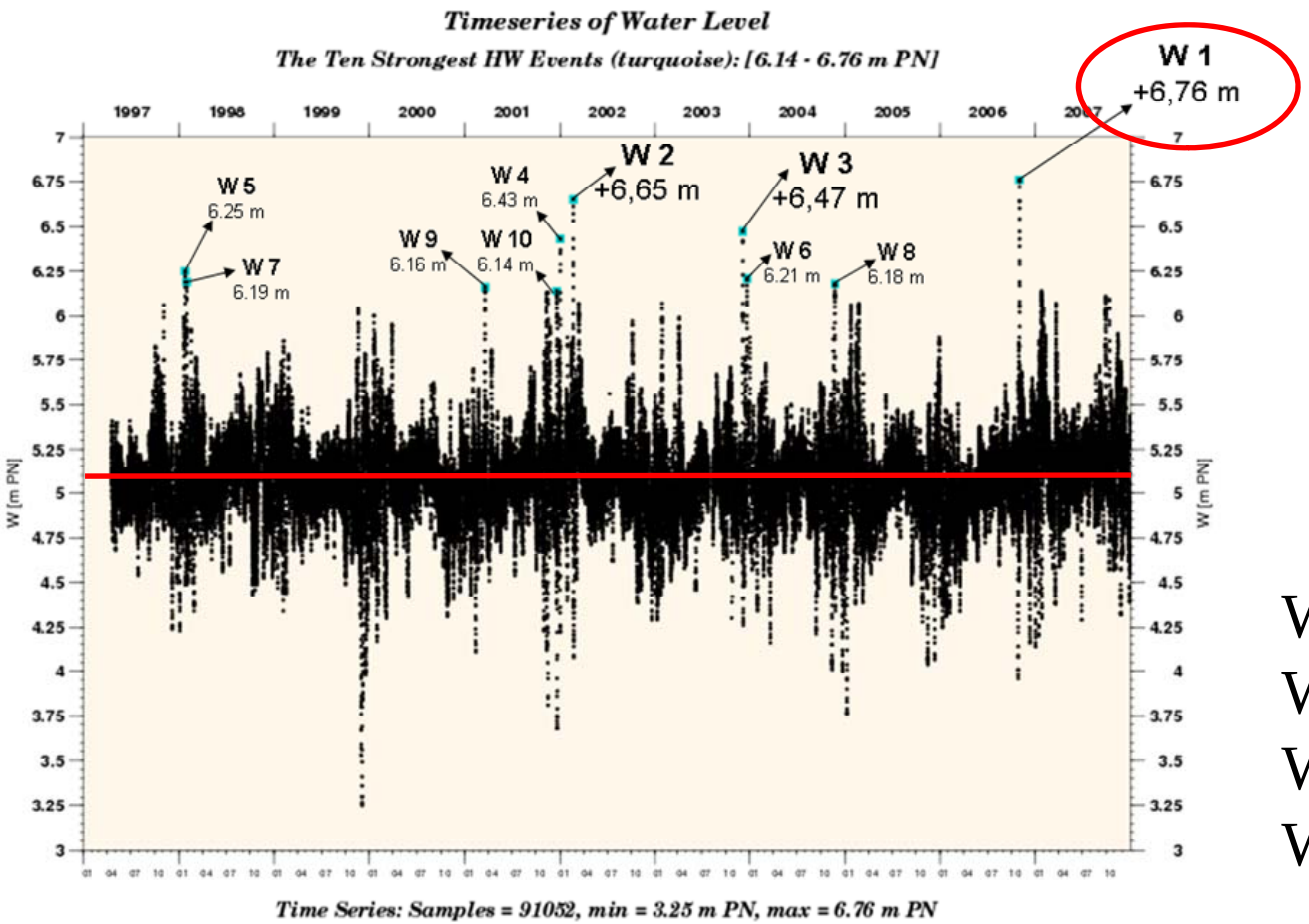
Water Level



W mean = 5.1 m
W sigma = 0.2 m
W max = 6.8 m
W min = 3.3 m

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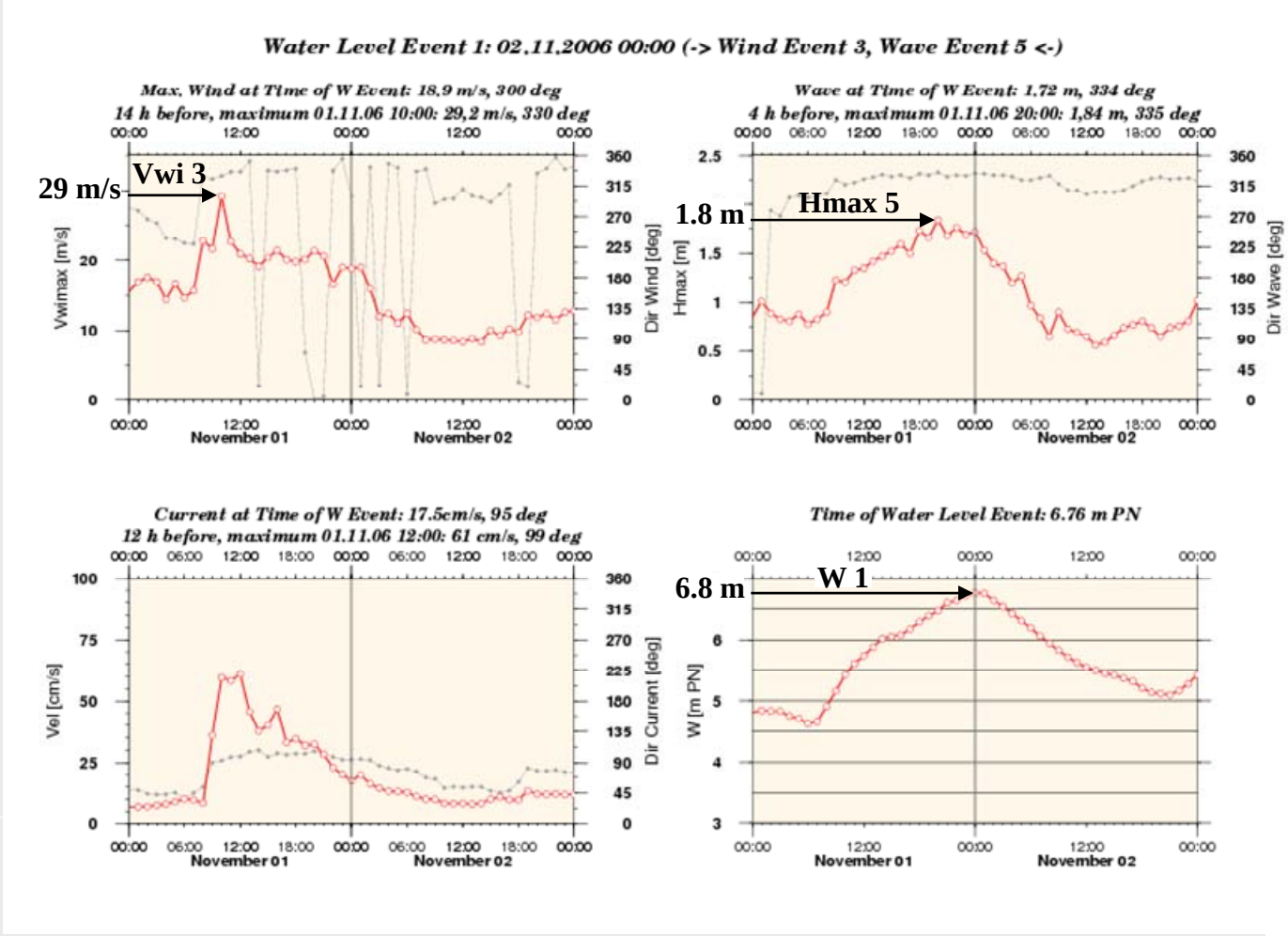
Strongest Water Level Event (W 1)



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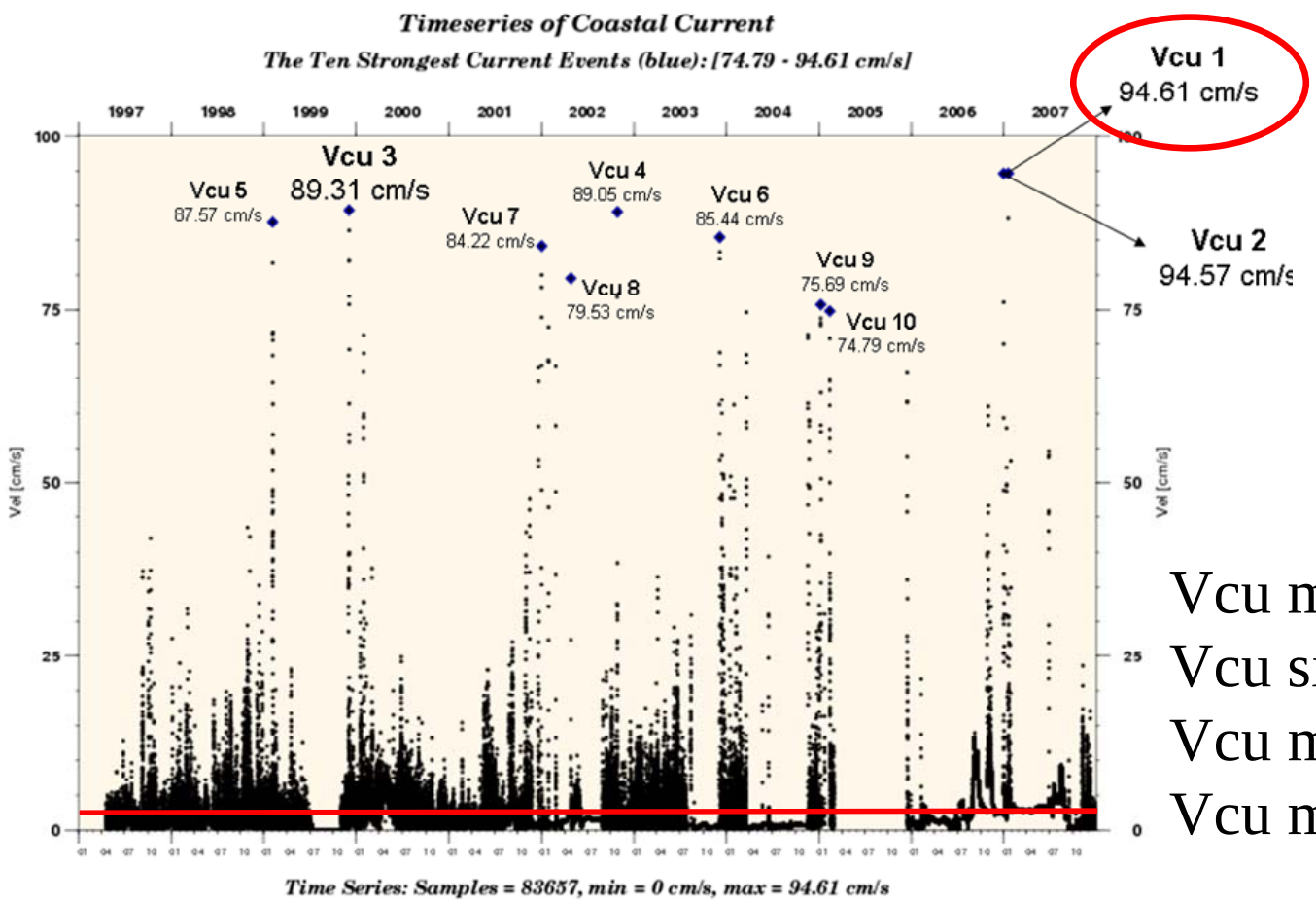
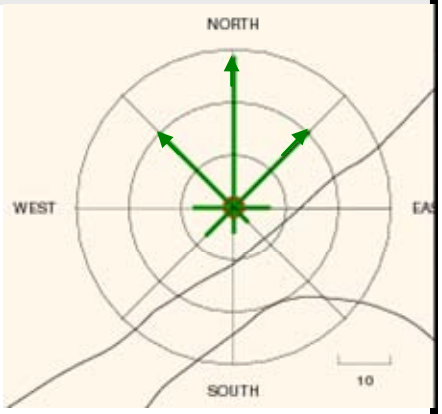
Bottom Current





Vcu mean = **2.7** cm/s
Vcu sigma = 4.3 cm/s
Vcu max = **96.6** cm/s
Vcu min = 0

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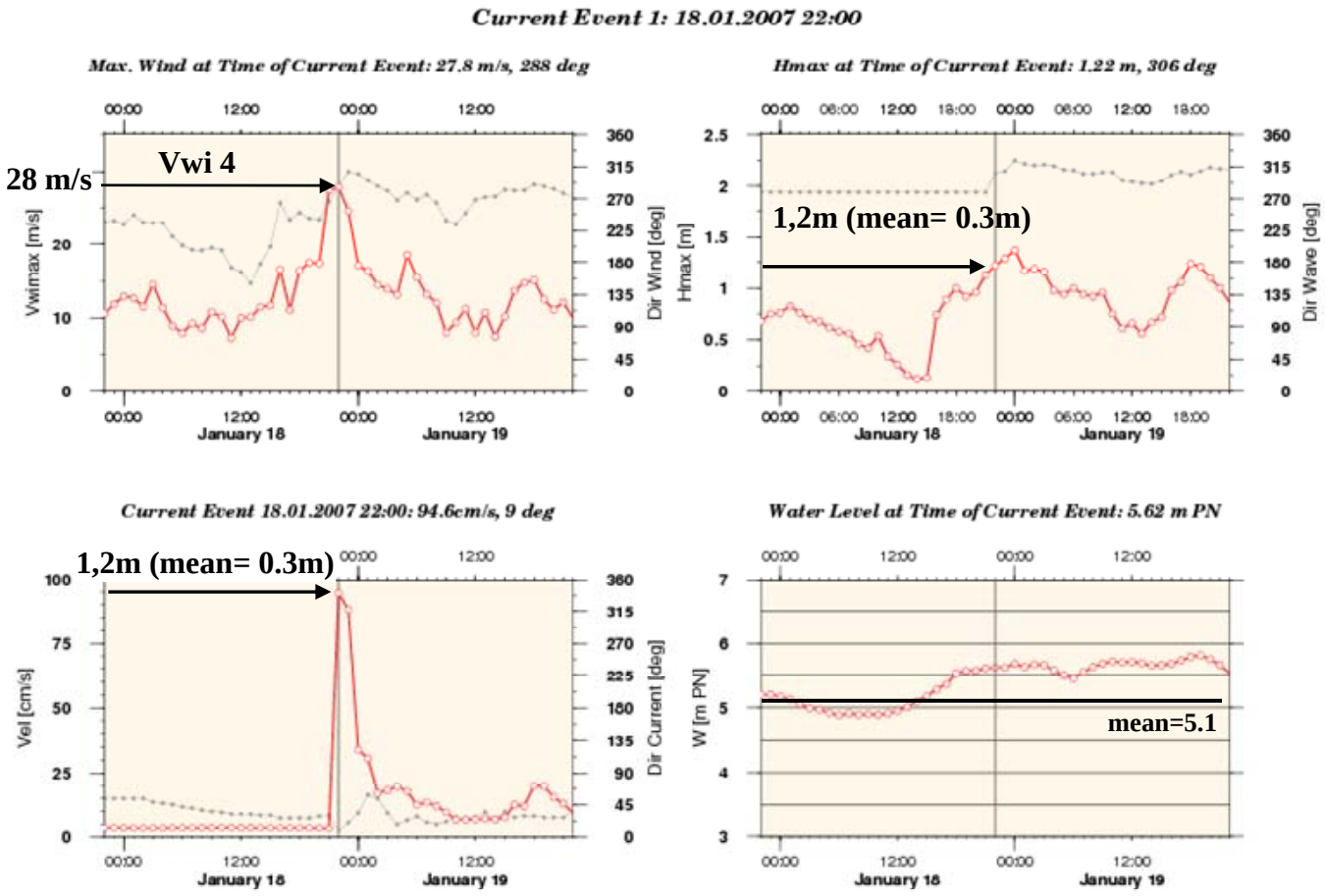
Strongest Current Event (Vcu 1)



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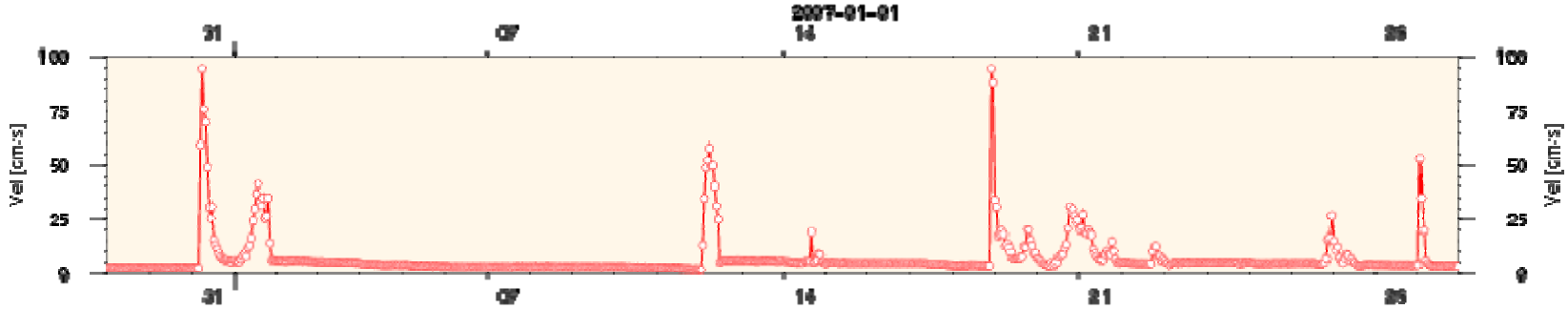
Uncertainties due to Coastal Current Events



Even if perfectly modelled:

3h Model-Output: Snapshot/History File
⇒Unlikely to capture this events

1d Model-Output: Average File
=> Smooth out the events

Conclusion/suggestion:

additional output (to 3h): in case of event
“process-controlled output”/event driven