

相模湾海洋短波レーダーの更新と データ検証について

Renewal of HF ocean radar in Sagami Bay
and validation of the data

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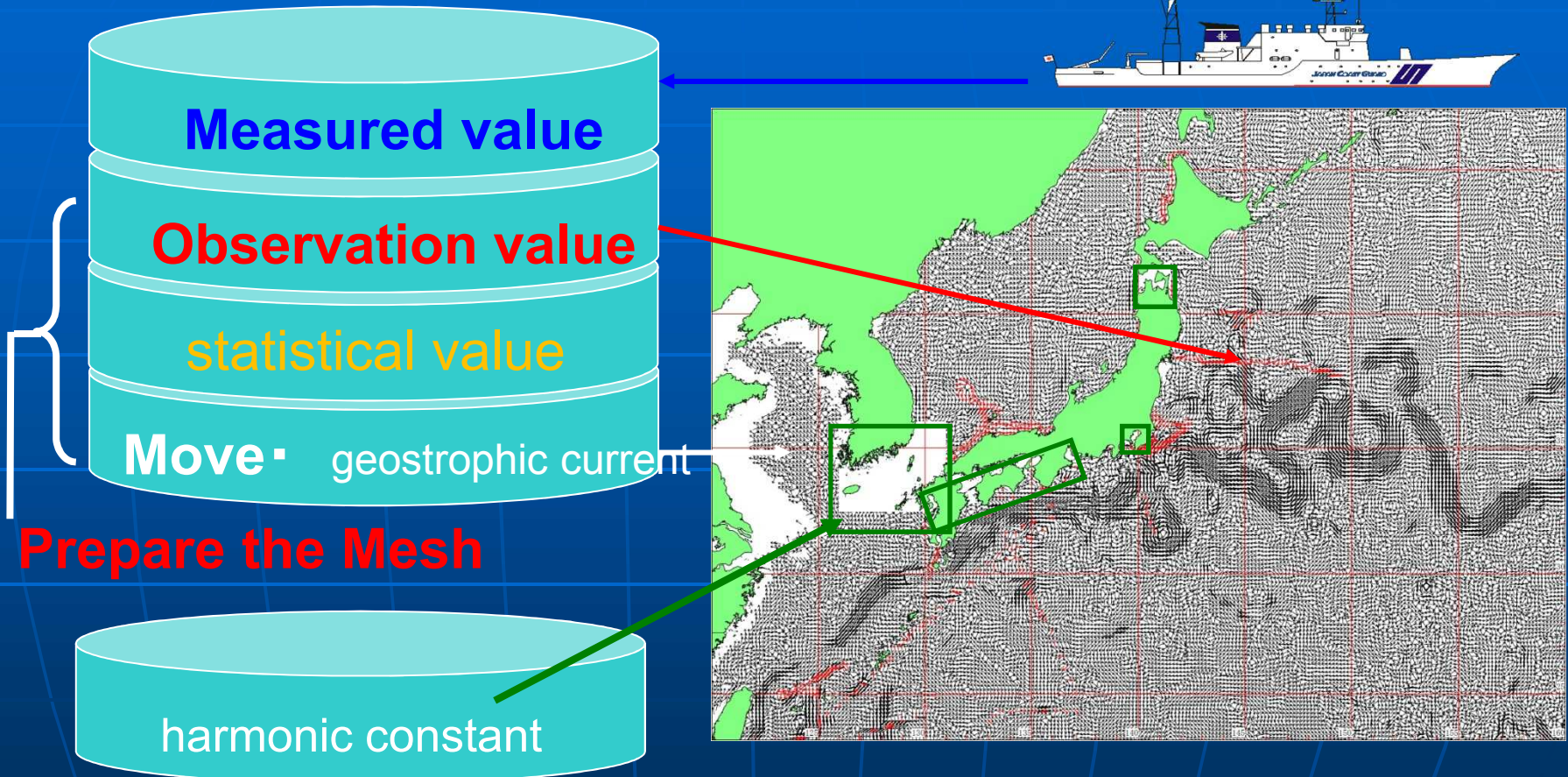
I.Nishimura・H.Morioka・K.Oikawa・H.Yoritaka
(Japan Coast Guard)

Outline

- Background of renewal HFR in Sagami bay
- Short summary of the HFR
- Observation for validation of the data
- future

Drifting prediction system PG

current

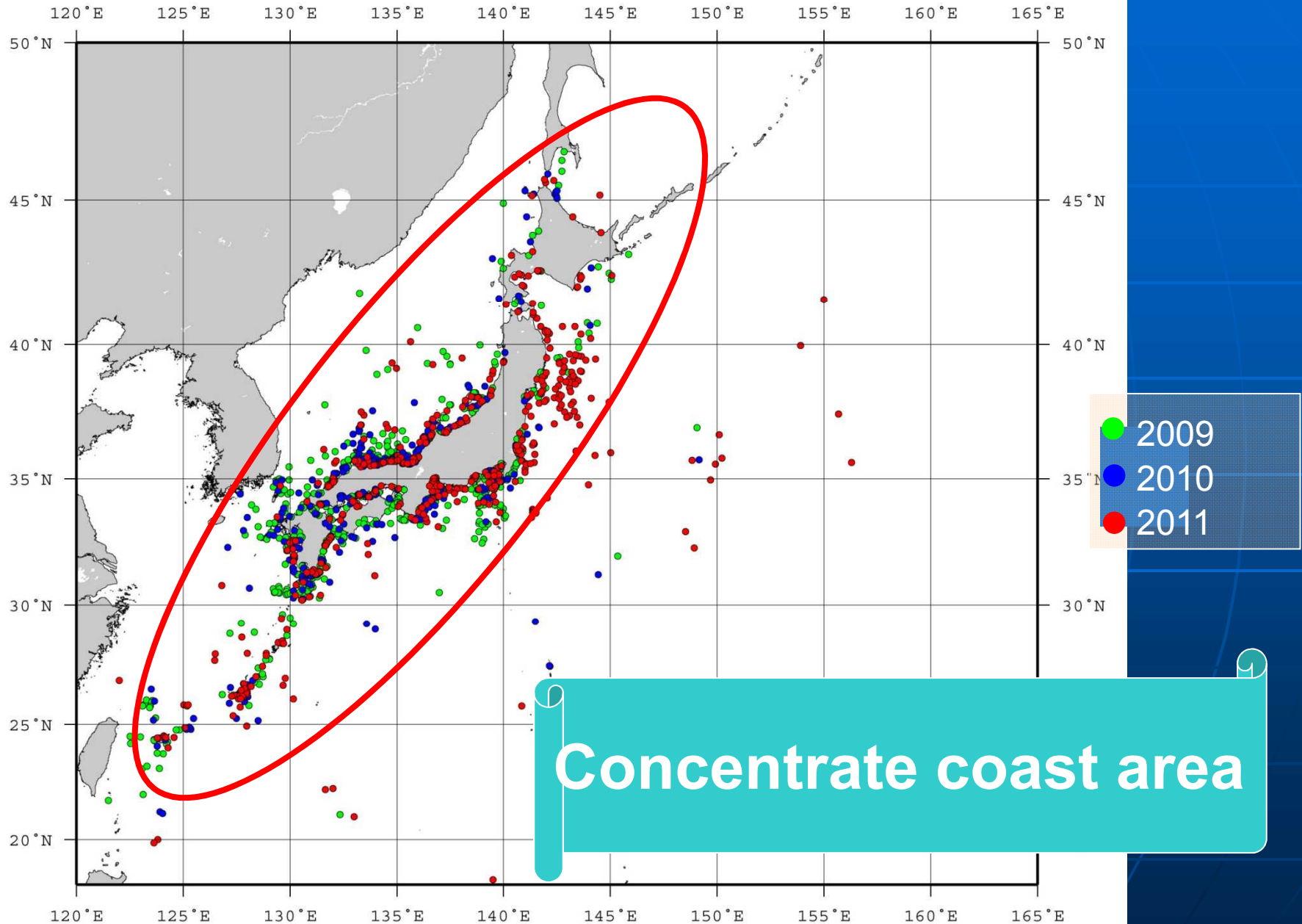


※潮流が支配的である海域は、潮流データを用いて漂流予測を行う

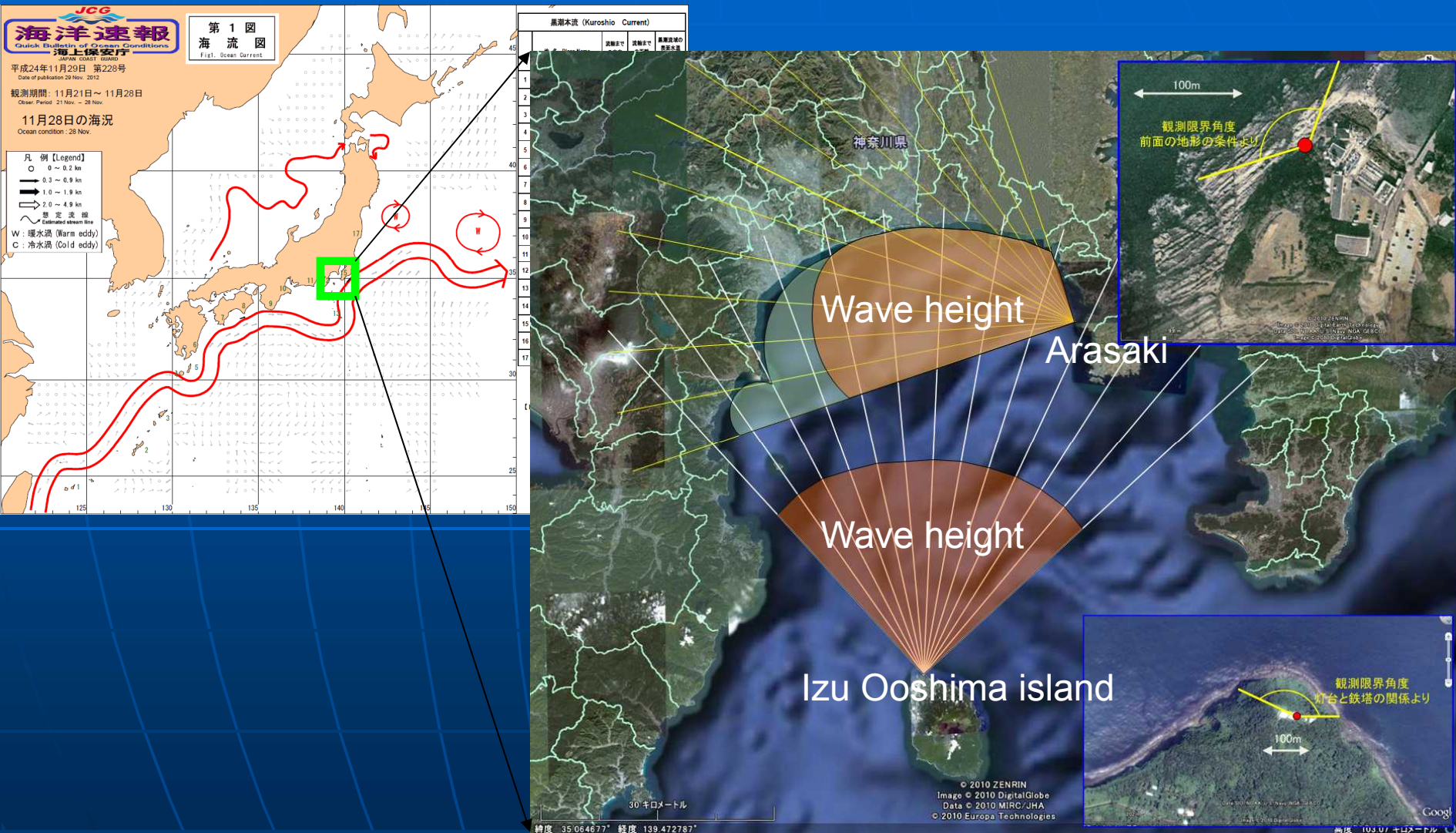
MOVE/MRI.COM-WNP: 北西太平洋海洋データ同化システム

⇒「データ同化」と「海洋数値モデル(予測を含む)」の統合システム

Recently drifting prediction point



HF ocean radar system in Sagami Bay



Radar station in Arasaki

Transmission antenna



Receiving antenna



Radar station in Ooshima island

Transmitted antenna



Receiving antenna
And
the Lighthouse



Basic specification

Observation area	Kuroshio	Sagami bay	Sagami bay
location	Nojimazaki Hachijo island	Arasaki Izu Ooshima	Arasaki Izu Ooshima
Type	Long Range	Mid Band	Mid Band
frequency Sweep span	5.1MHz (15KHz)	24.5MHz (100KHz)	24.5MHz (100KHz)
range	6~200km	1.5~60km	1.5~60km
resolution capability	10km(距離方向) 5° (方位)	1.5km(距離方向) 5° (方位)	1.5km(距離方向) 7.5° (方位)
Time	常時送信	45分~15分(大島) 15分~45分(荒崎)	0分~10分
Renewal time	3hours	1hour	1hour
Start	Aug.2001	Aug.2002	Apr.2012
maker	CODAR	三菱電機(株)	NJRC

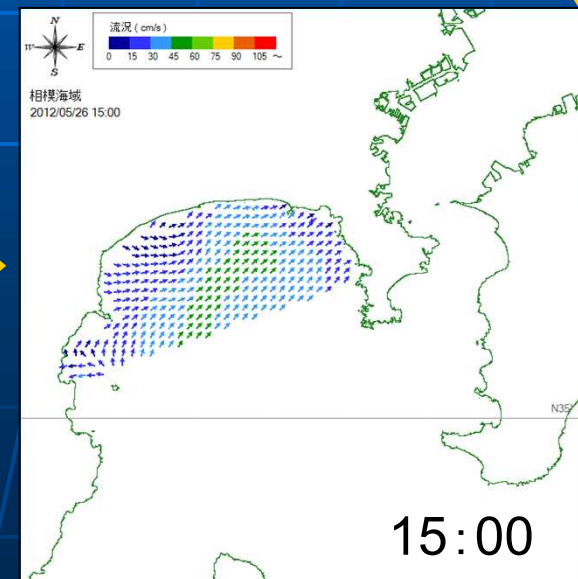
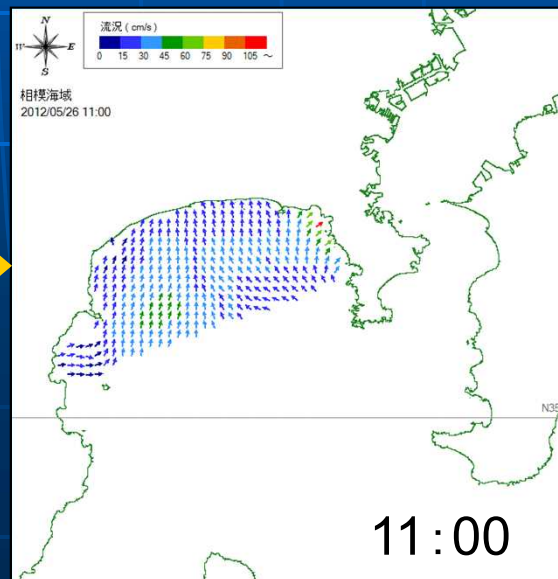
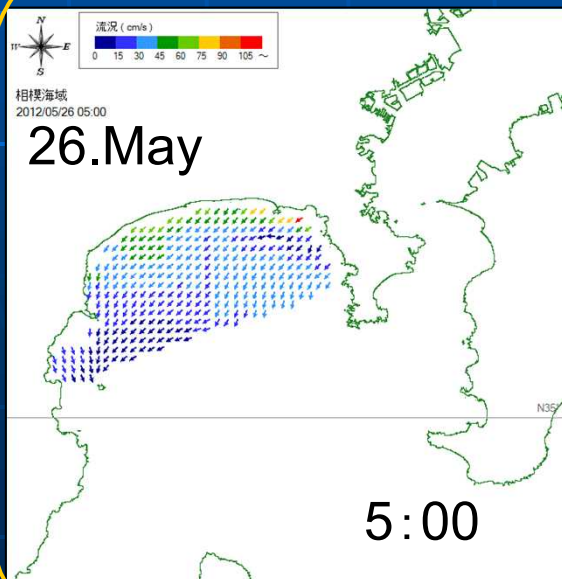
What's new?

- Starting provide information of Wave height
- Renewal of HP
 - 野島崎-八丈島局と合せて1つのHPに
 - 時系列データの表示
 - データや画像等のDLが可能に

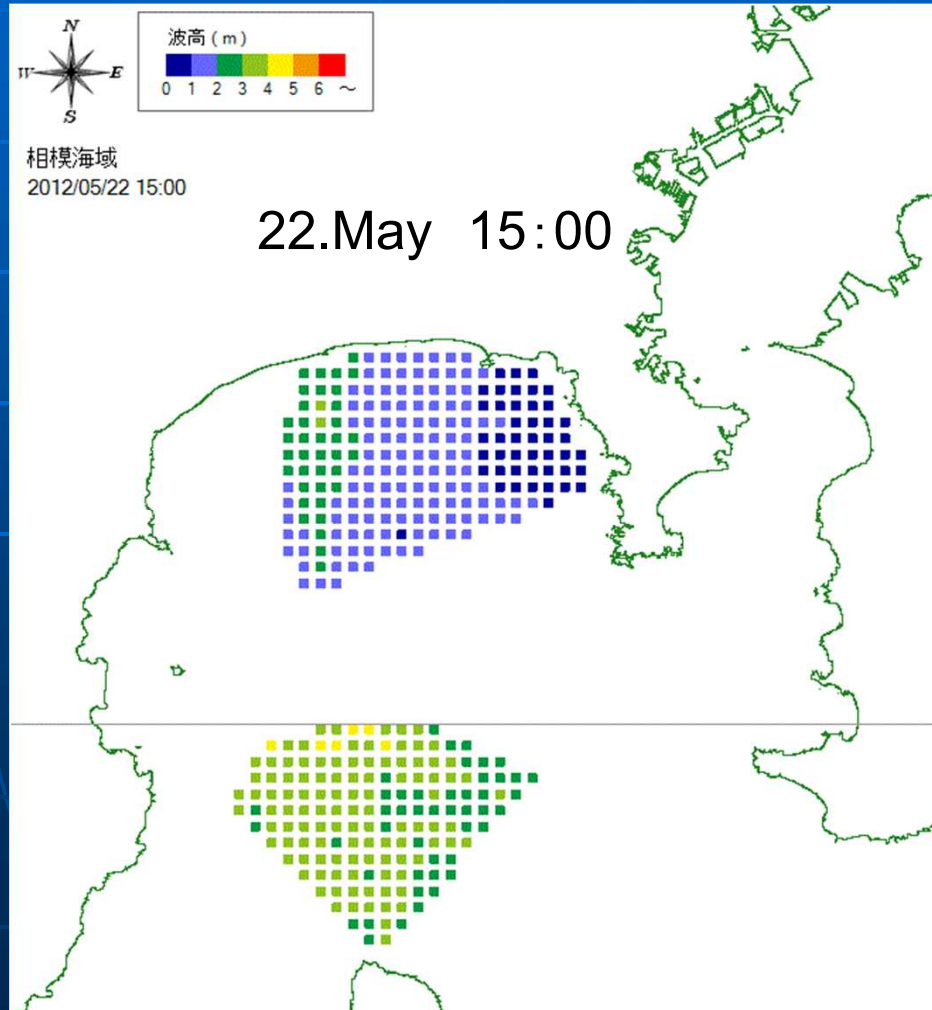
<http://www1.kaiho.mlit.go.jp/KANKYO/KAIYO/oceanradar/>
- 受信アンテナを標準より2本少ない6本で運用
 - 設置スペースの省力化

Example of current observation

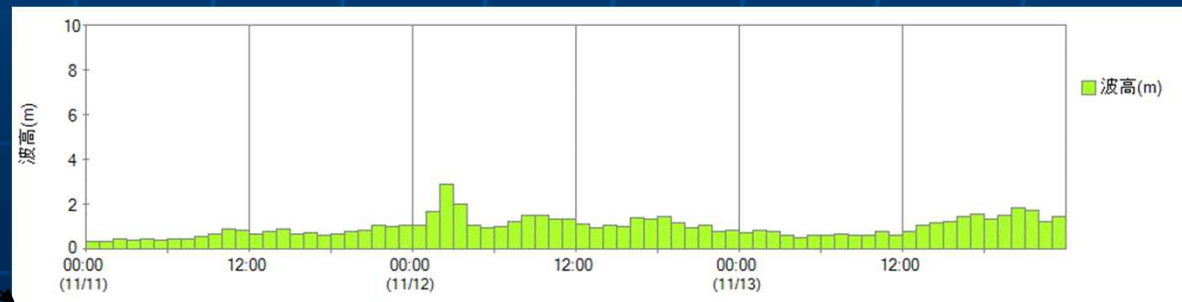
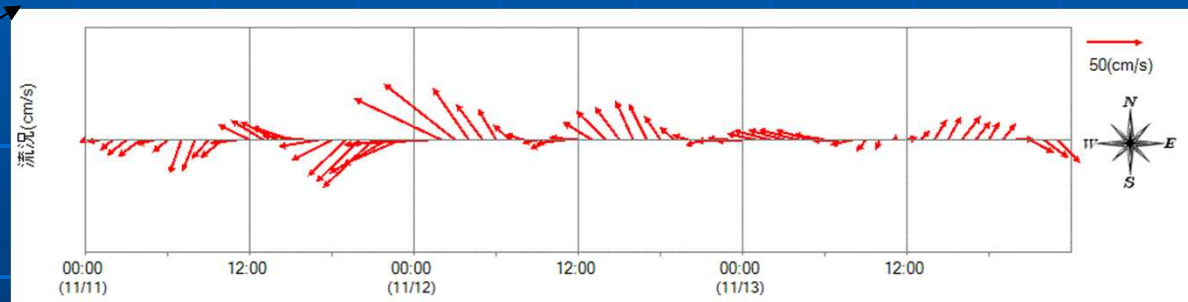
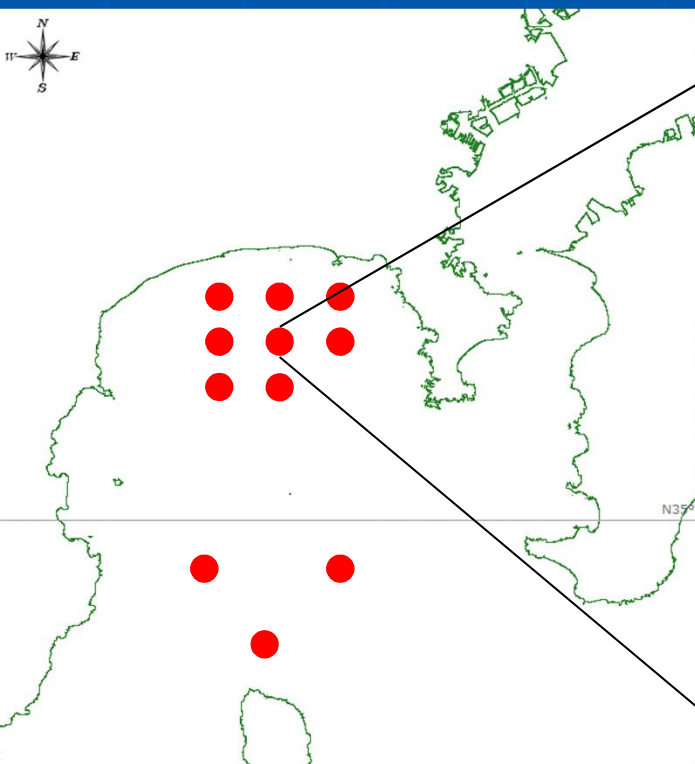
- 日変化レベルの流れの変化を捉える
- 時計回りの流れの存在



Example of wave height observation



Time series



Material and Methods

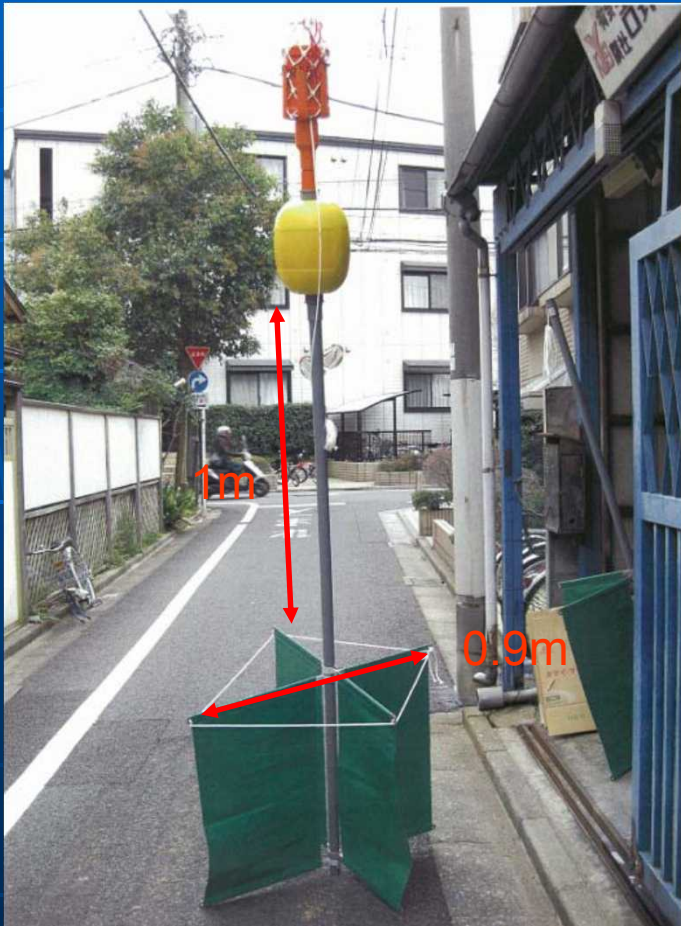
- Drifting buoy
drogue(3基),
parachute(Surface type3基、under water type3基)
ダミー人形付(doll)(1基)
- 船舶搭載ADCP
Survey ship KAIYO (JCG)
- 平塚沖総合実験tower data
Wave height

Drifting buoy with GPS



- Dimensions:
 - 10 cm in diameter
 - 25 cm in height
 - 1.0 kg in weight
 - ブイ筐体の浮上位置が可変
- Positioning:
 - GPS system
- Data transfer:
 - mobile reception
 - Min:5 minutes apart

Buoy with drogue and doll



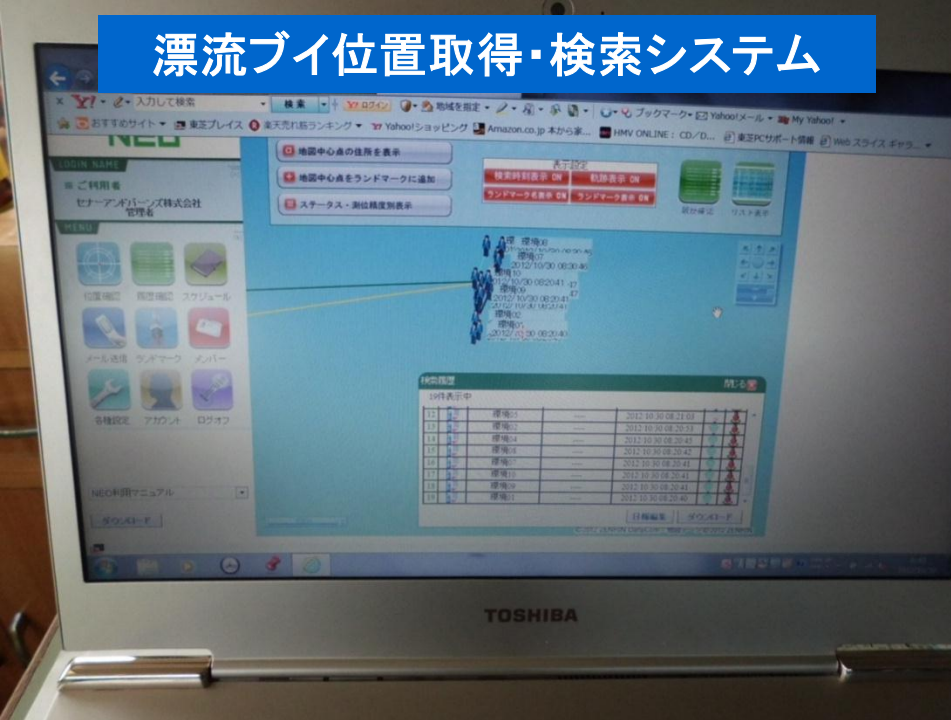
3種類の漂流ブイ及びダミー人形



投入直後の漂流ブイ及びダミー人形



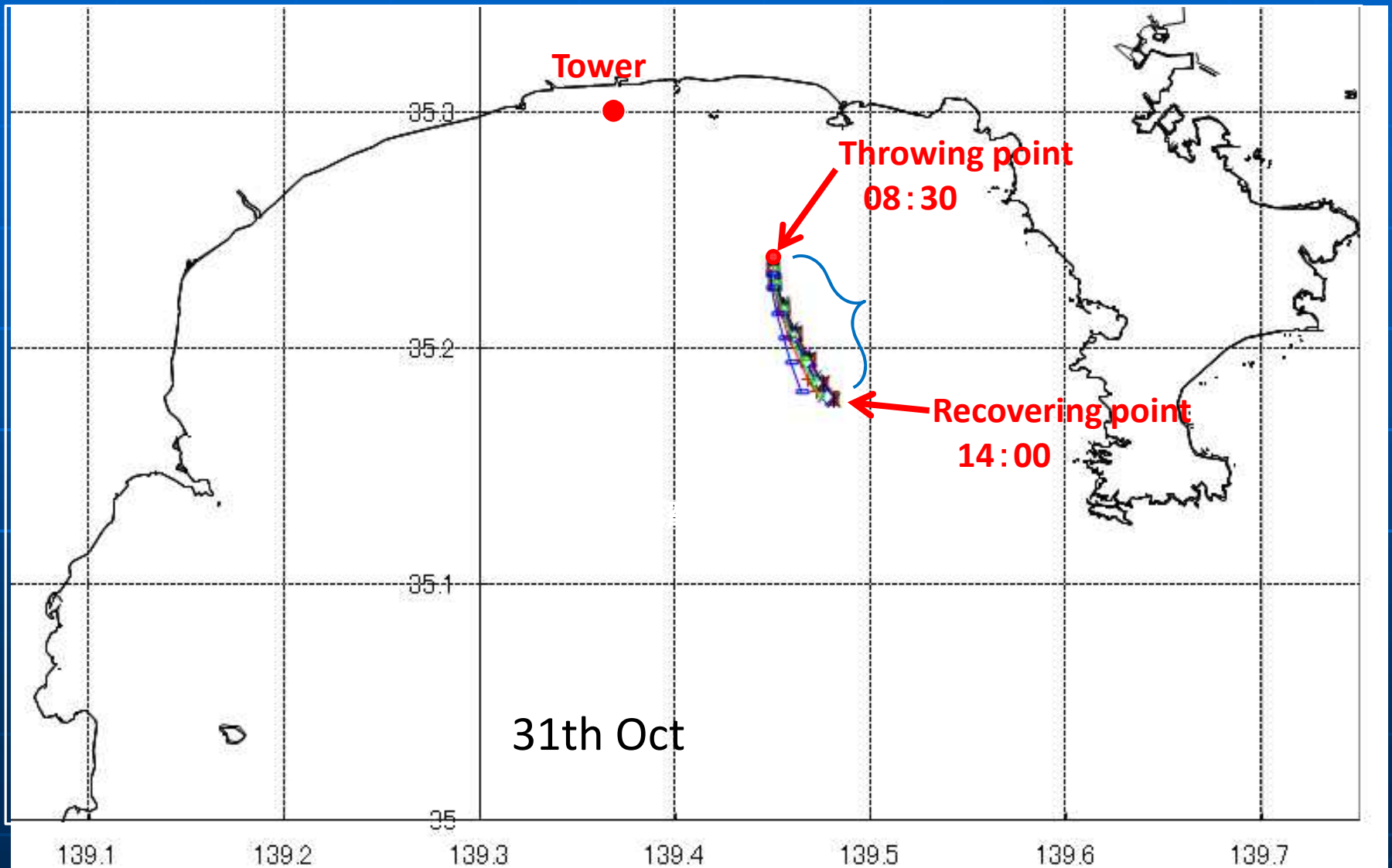
漂流ブイ位置取得・検索システム



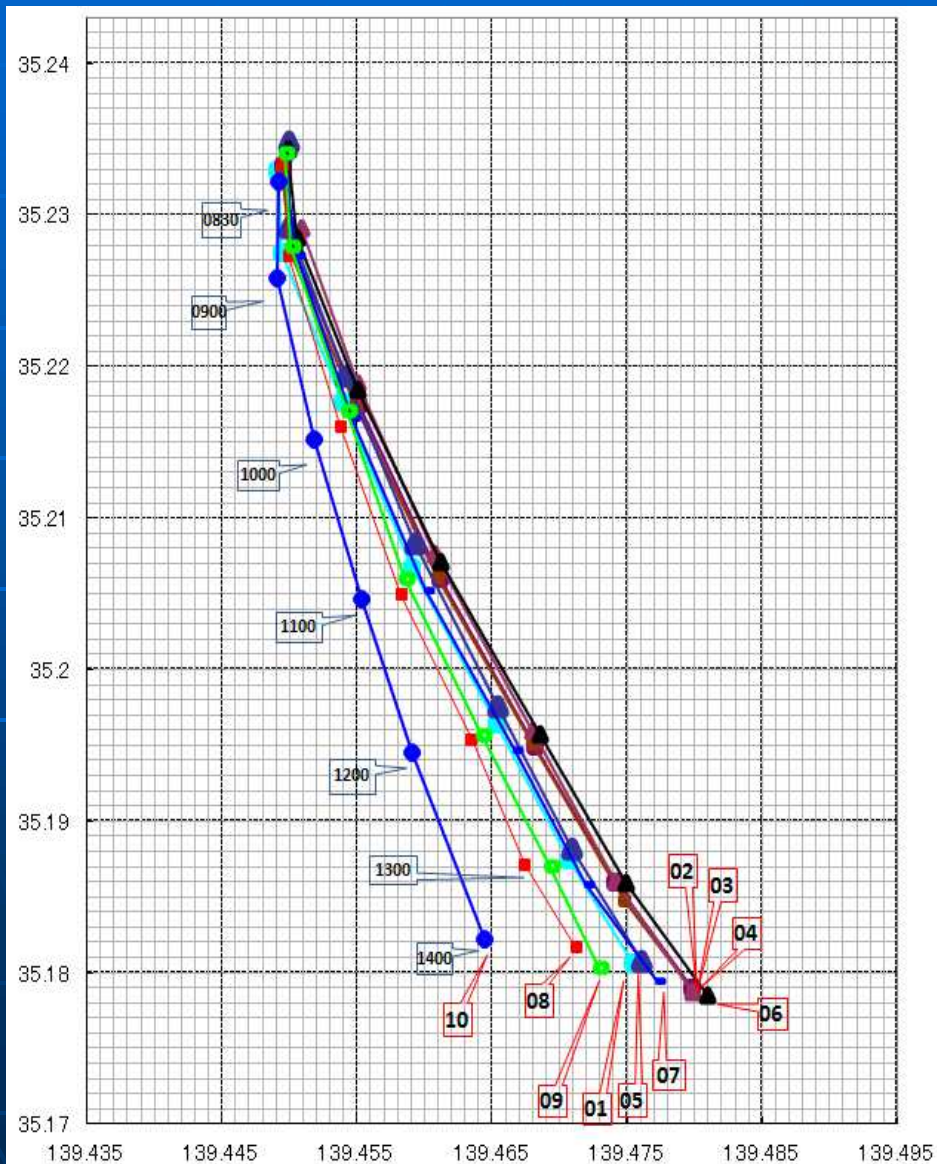
漂流ブイの揚収



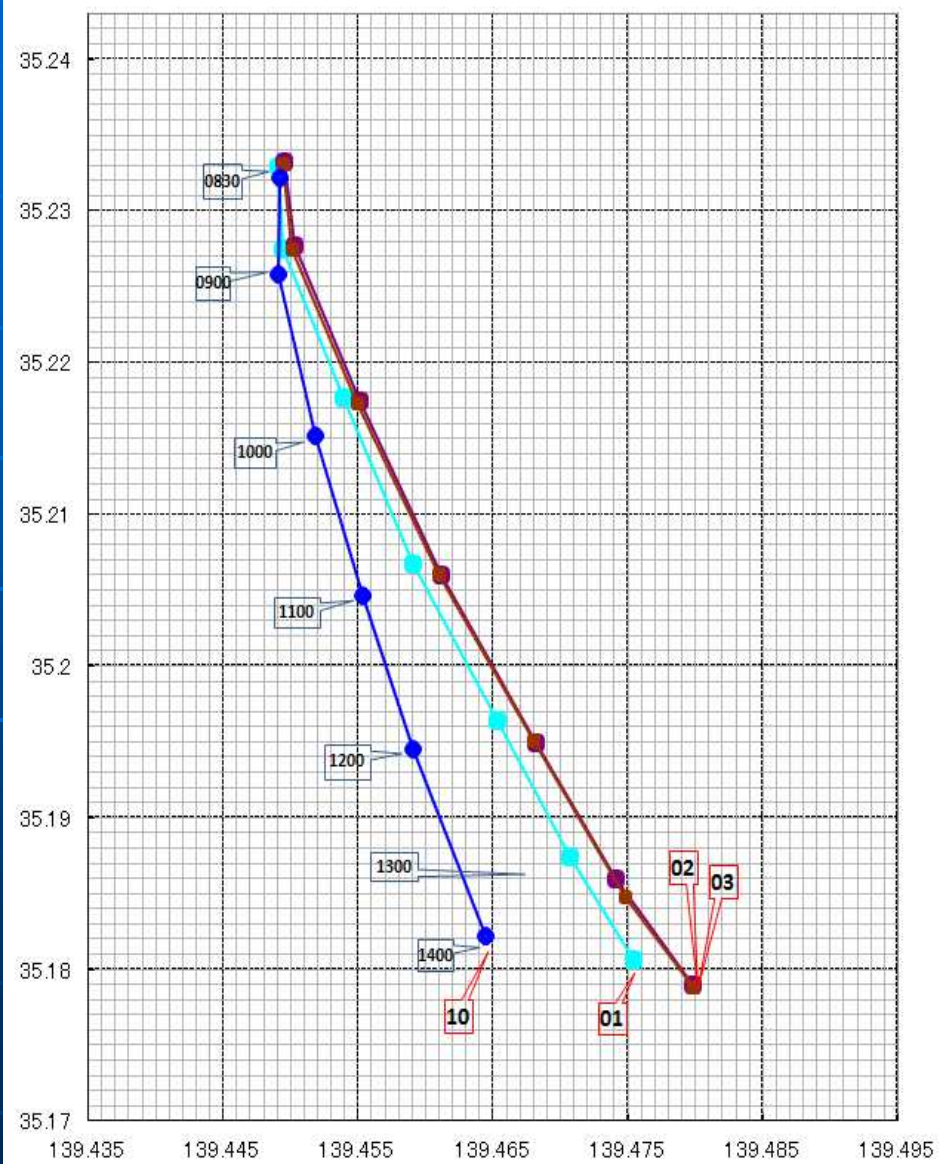
Buoy Trajectory



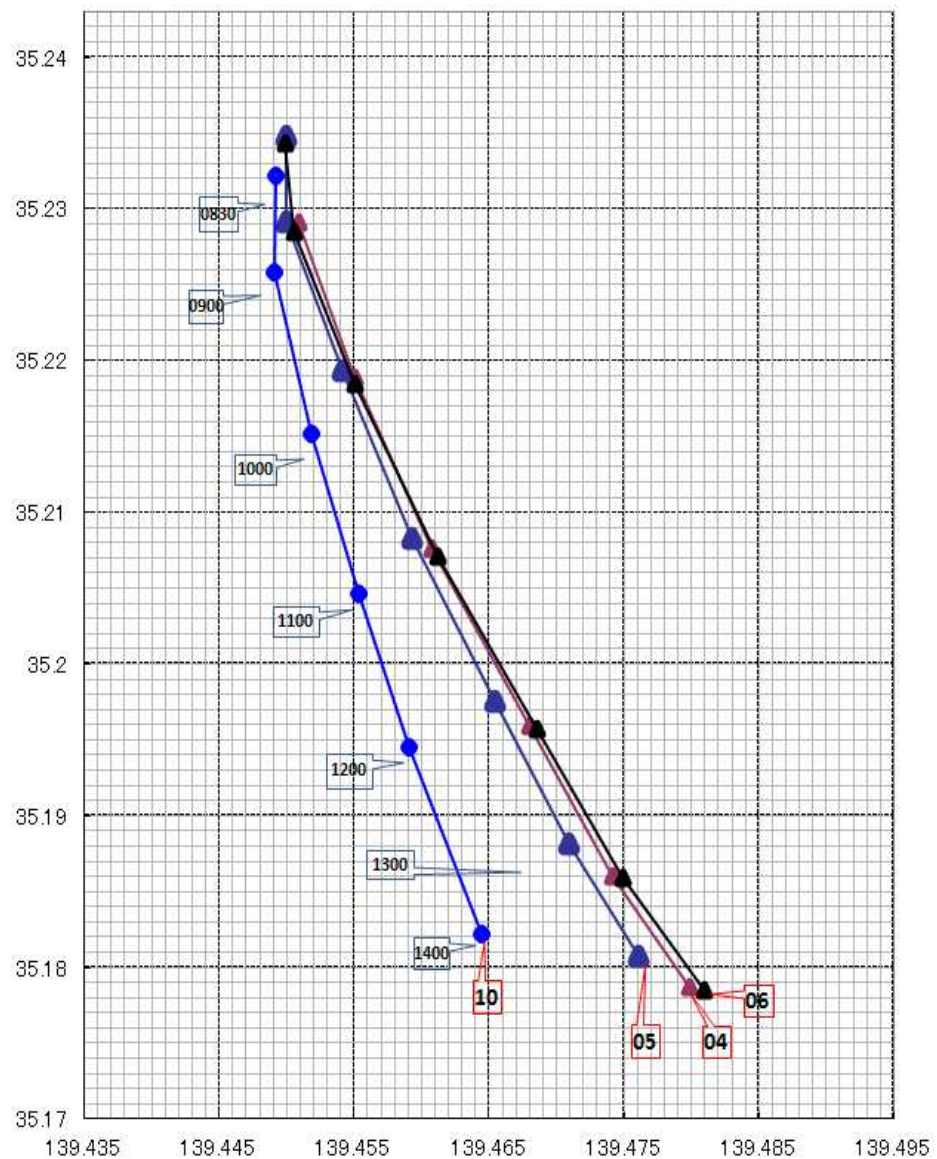
All trajectory



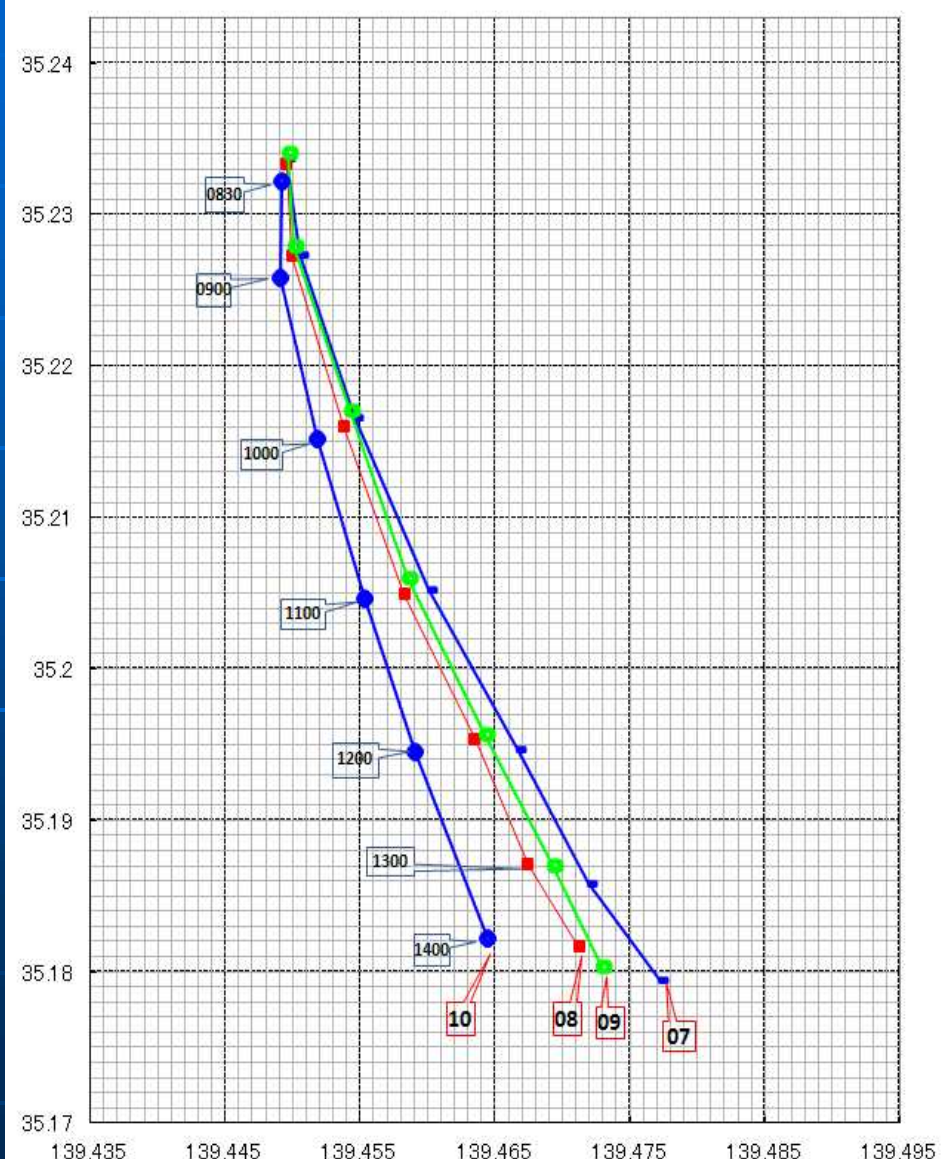
Doll and buoy with drogue trajectory



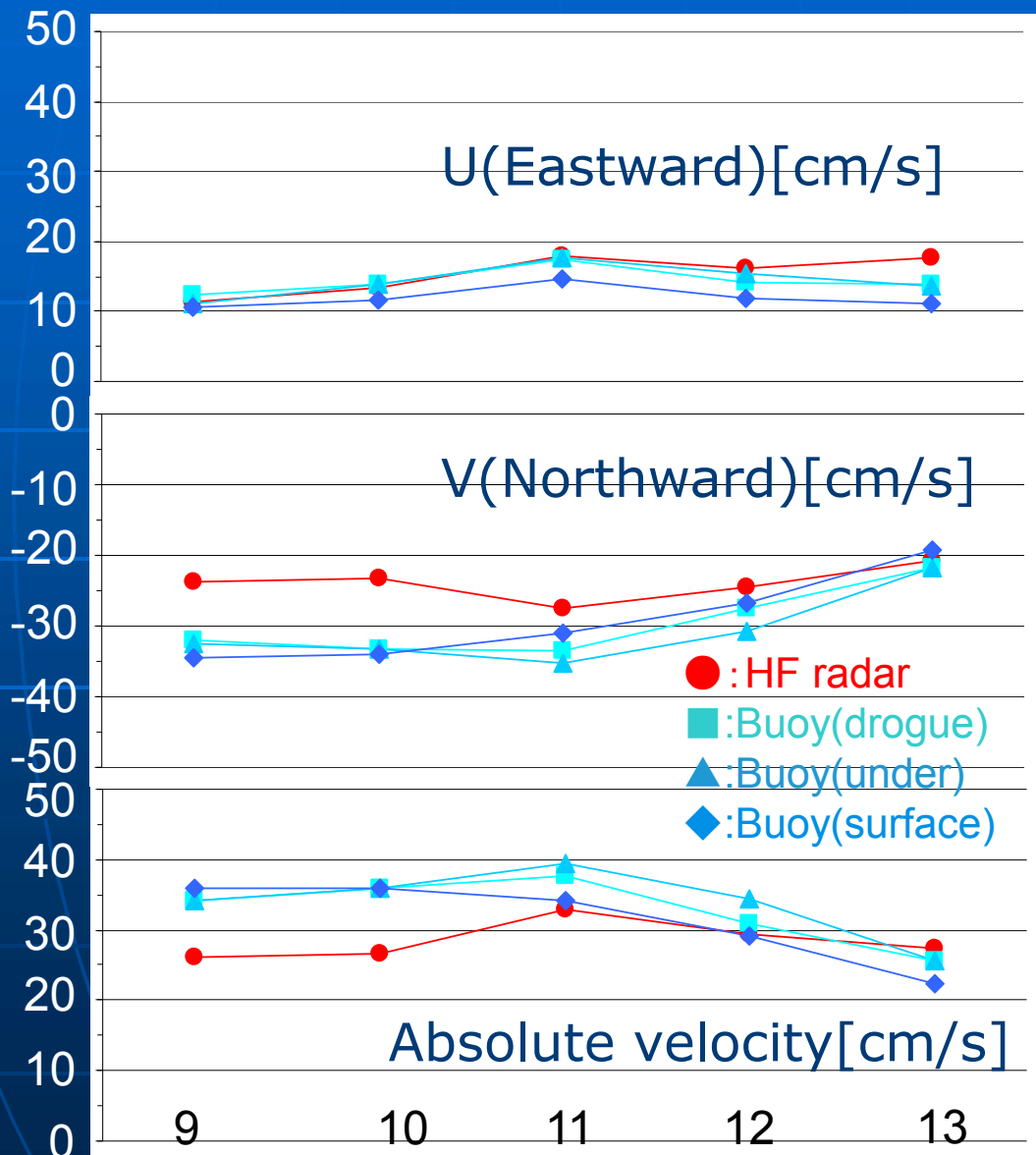
Doll and buoy with buoy underwater trajectory



Doll and buoy with drogue surface trajectory



Observation data of HF radar and buoy



Wind	
degree	m/s
034	3.65
055	1.99
119	1.24
172	1.88
179	3.19
188	4.05

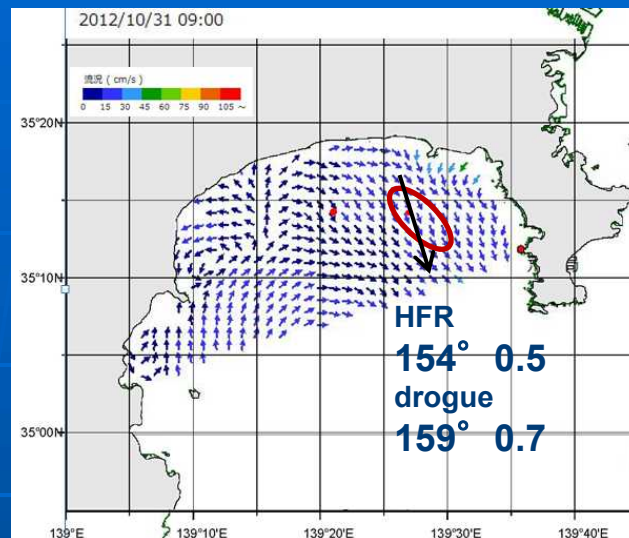
RMS

		RMS
drogue	Eastward	3.42
	Northward	6.74
	Absolute	7.69
Under water	Eastward	2.91
	Northward	6.31
	Absolute	7.19
Surface	Eastward	3.78
	Northward	8.66
	Absolute	9.75

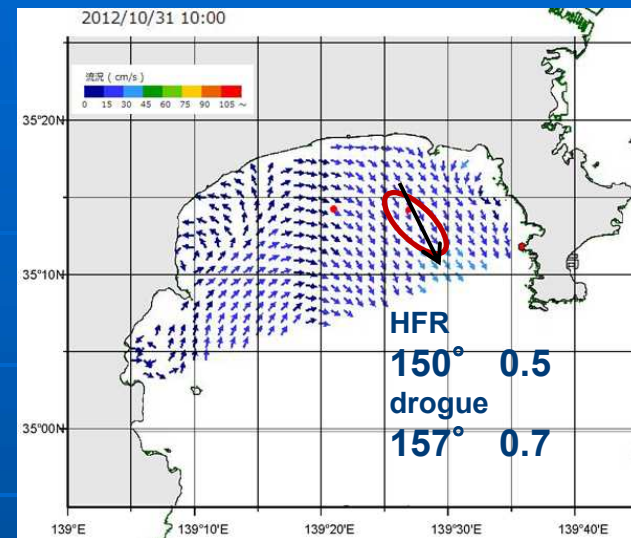
HE radar and buoy with drogue value

2012. 10. 31

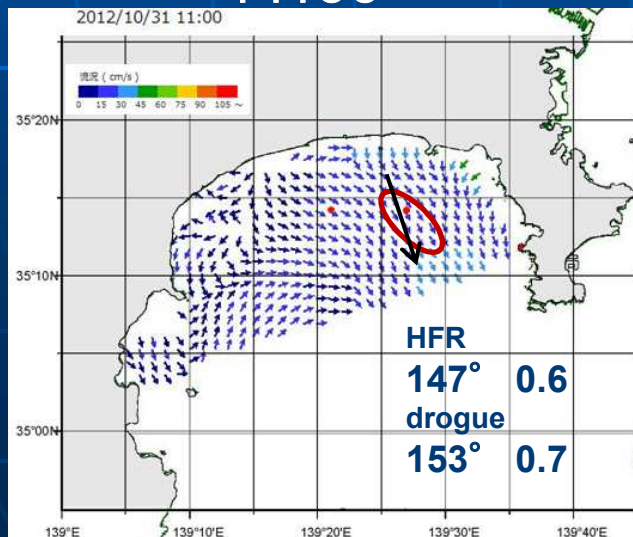
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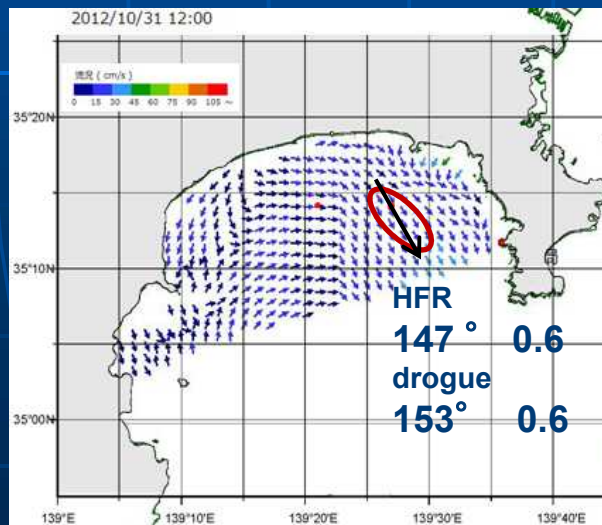
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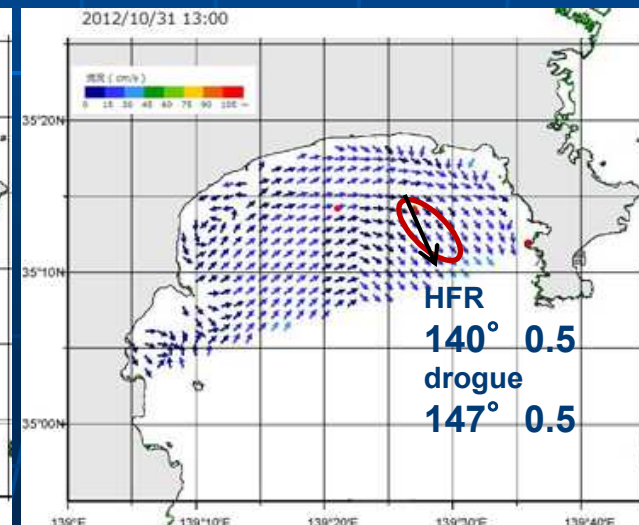
11:00



12:00



13:00

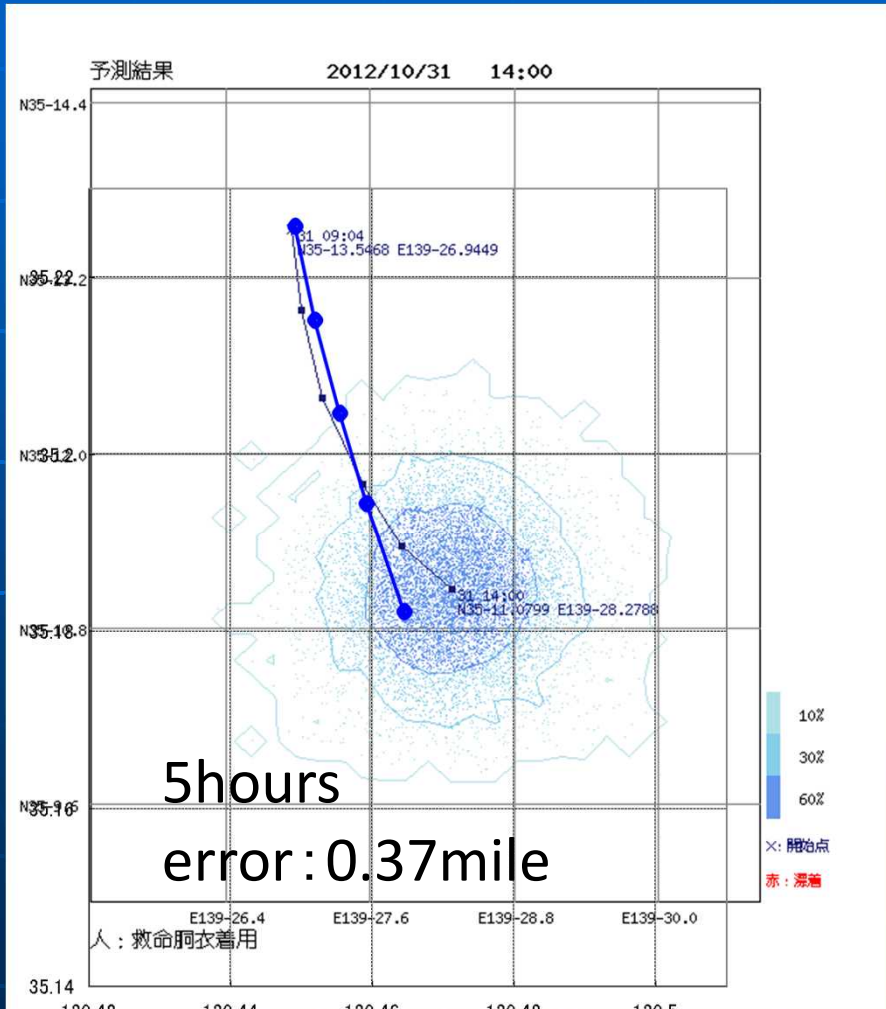


drogue

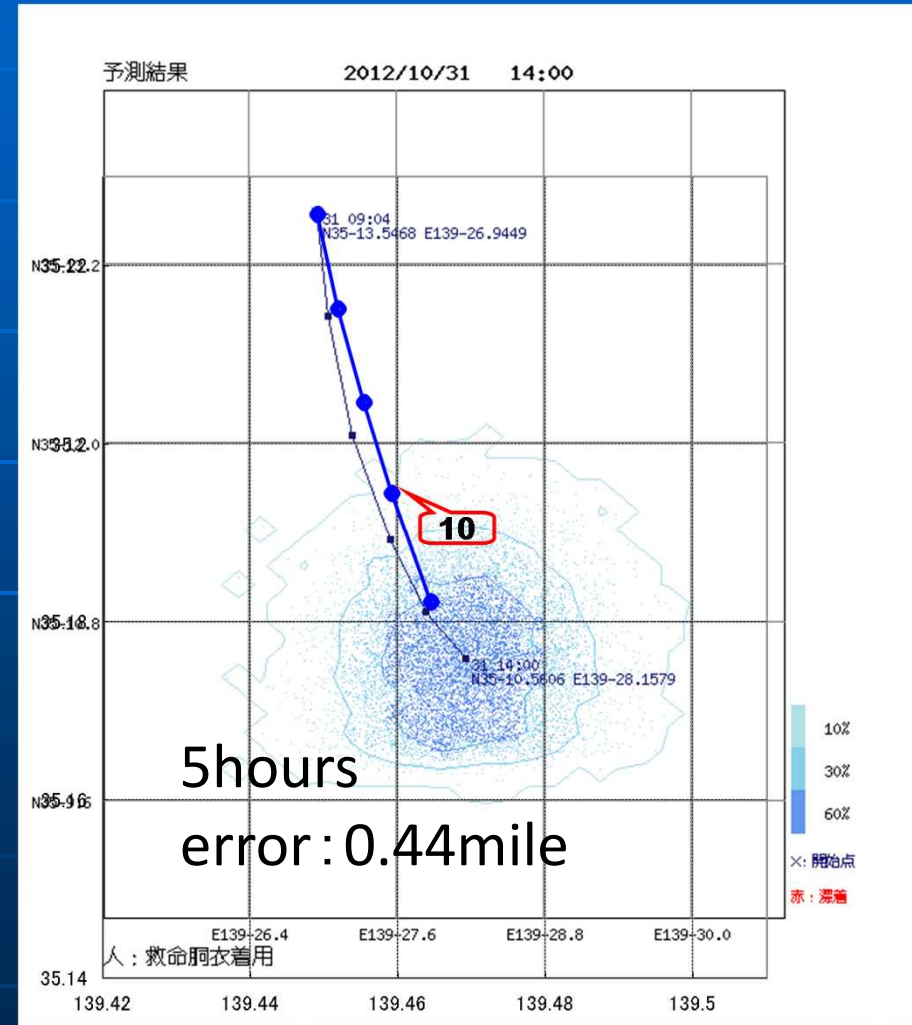
Observation area

Drifting route of the doll and result

HFR

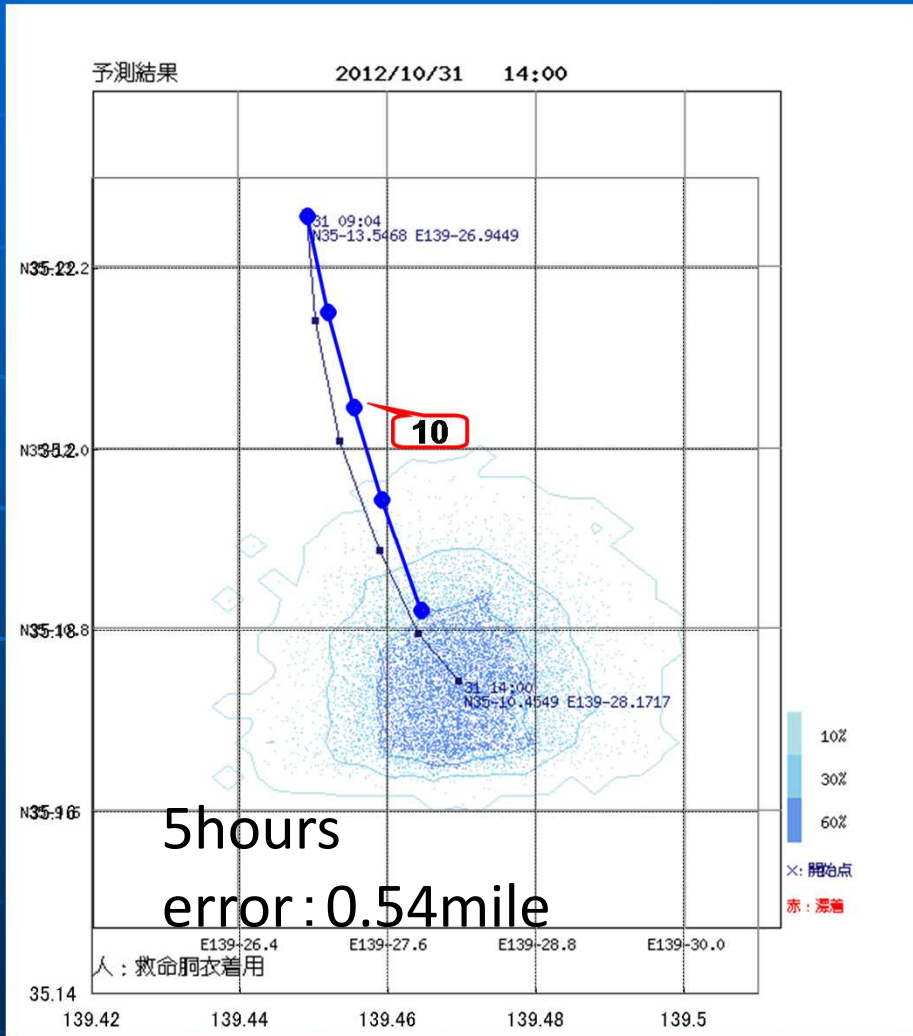


Buoy with drogue

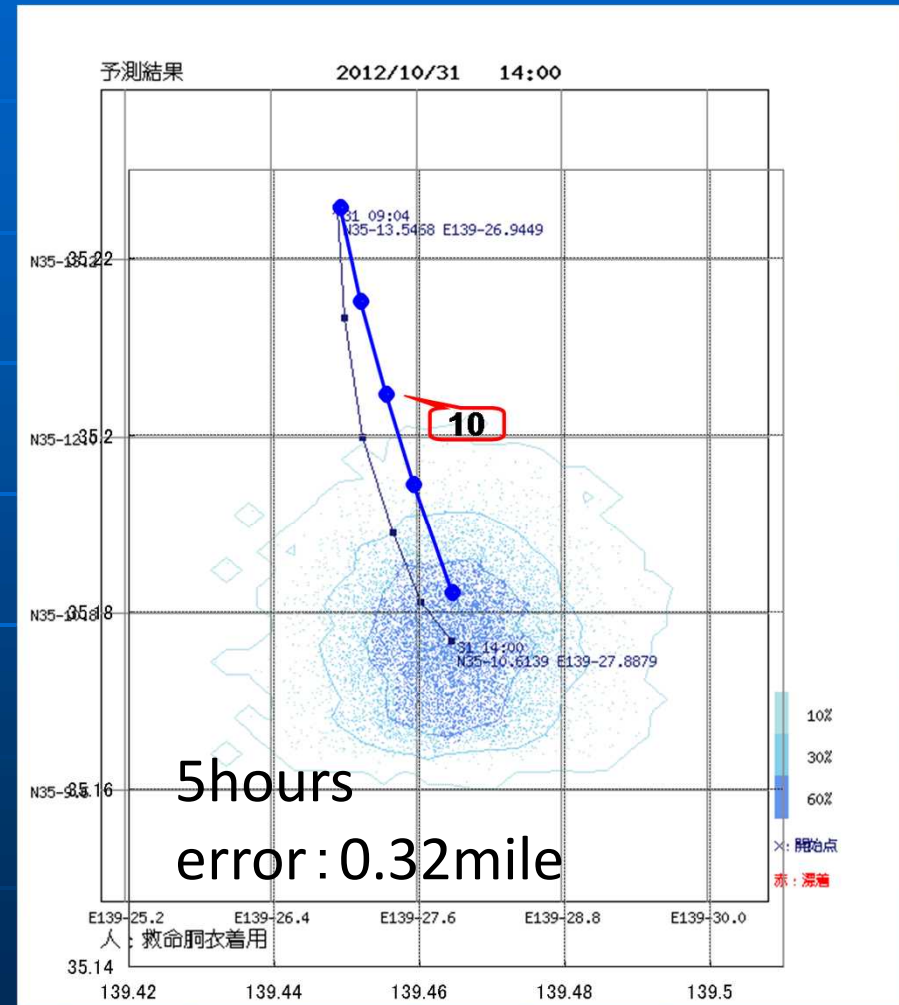


Drifting route of the doll and result

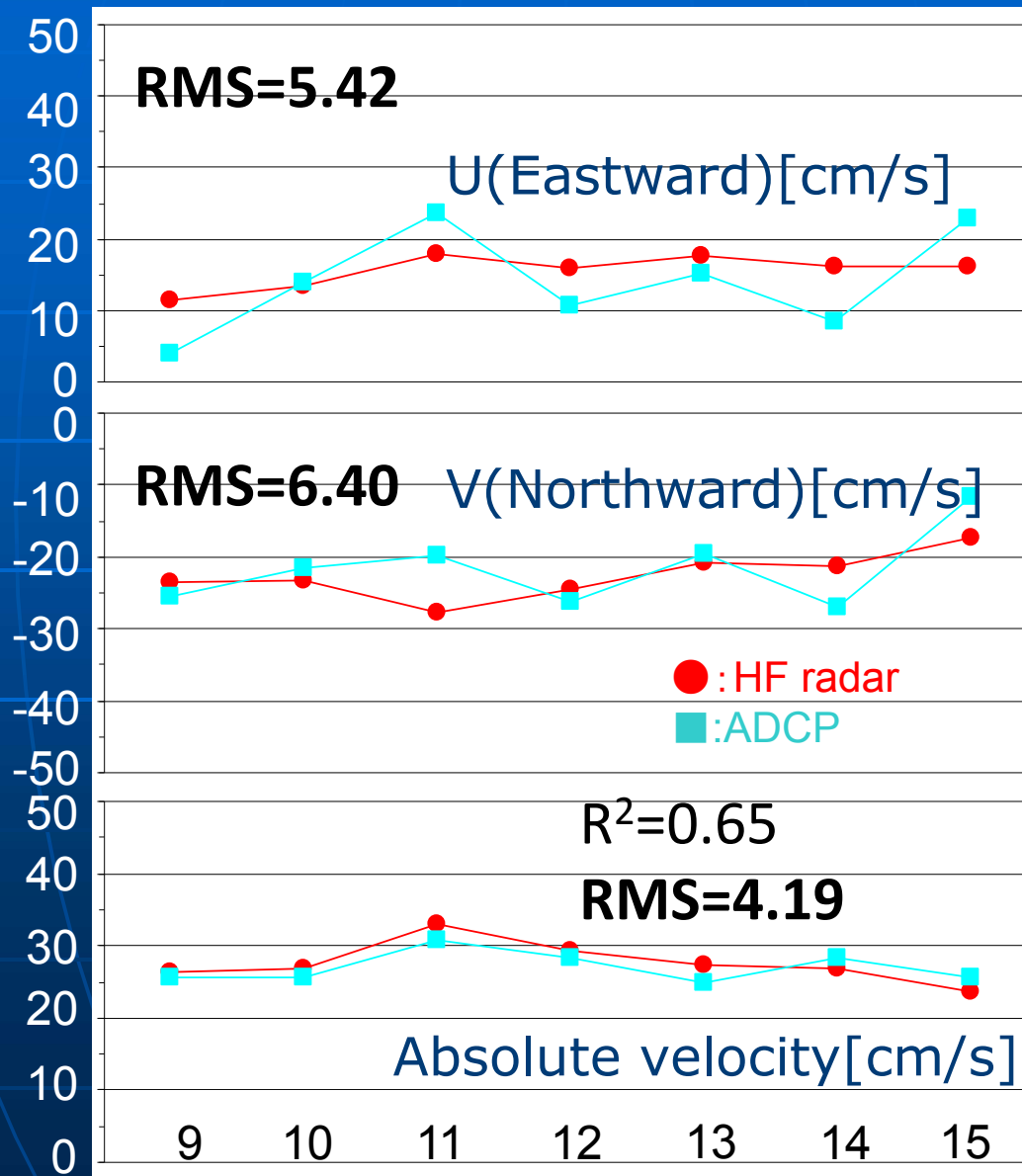
Buoy with parachute(surface)



Buoy with parachute(under)



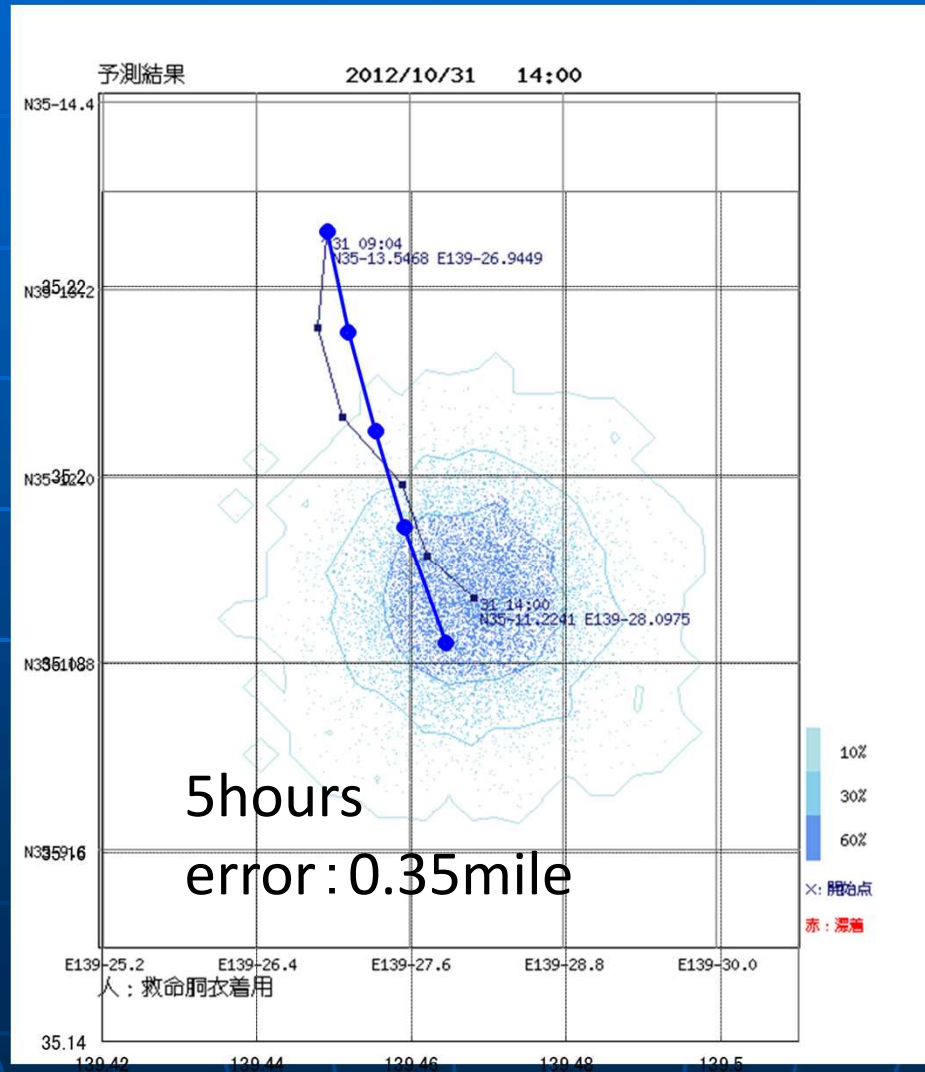
Observation data of HF radar and ADCP



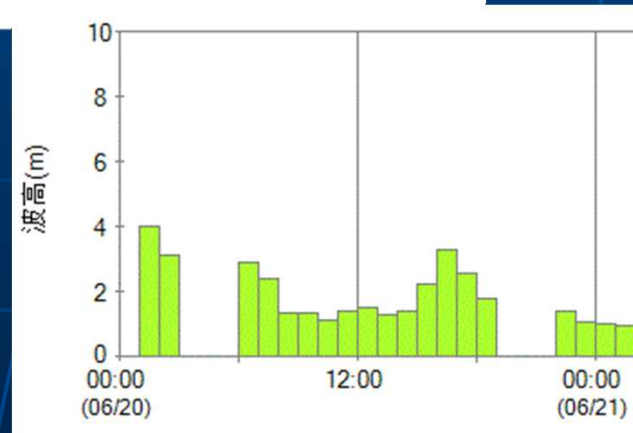
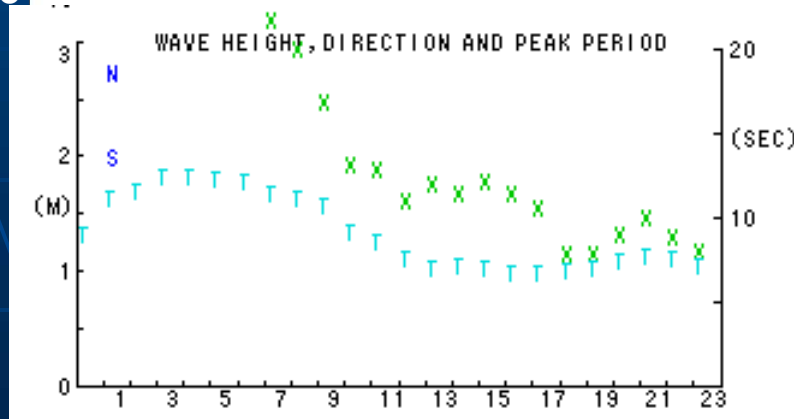
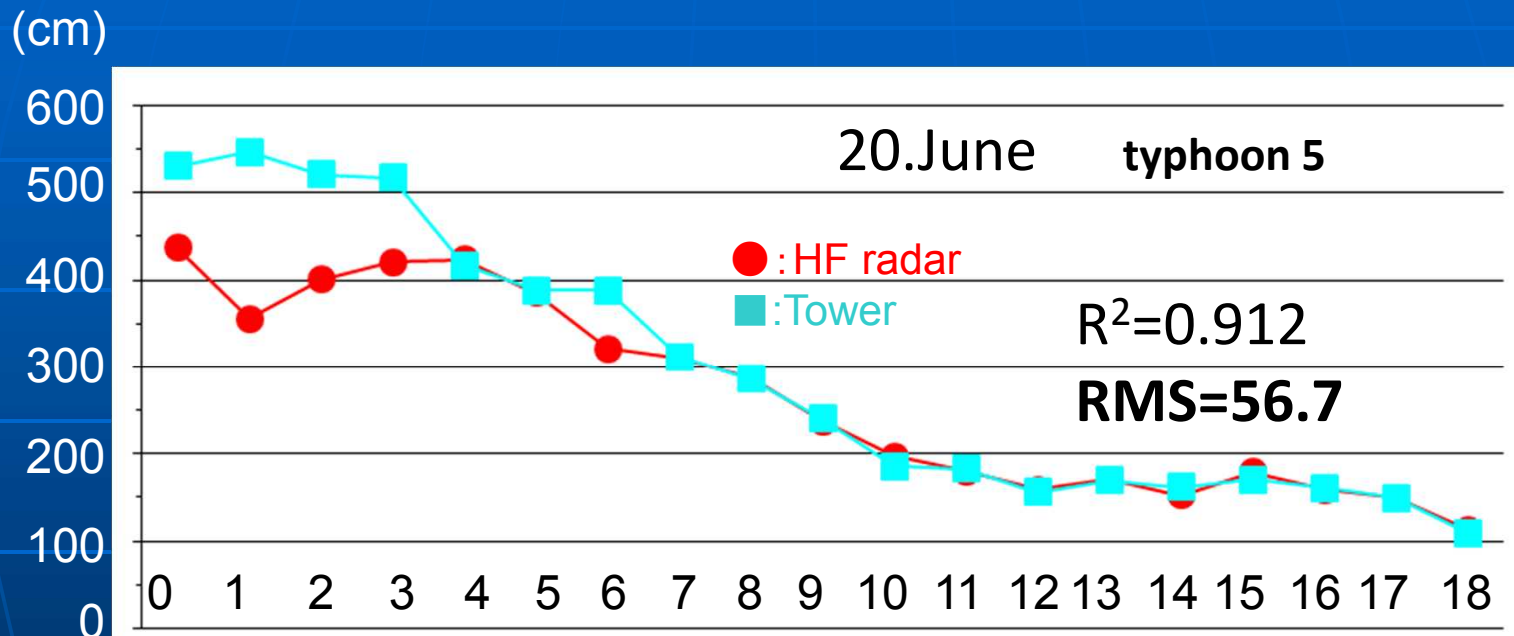
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Drifting route of the doll and result

ADCP



Wave height data of HF radar and Tower



Observation Conclusion

- 漂流ブイでは、水中型の値に近い
- 絶対値が全体的に低めにでている
- ADCPの流れともおおむねあっている
- 波高のデータも高波の値に差があるものの
おおむね合致している
- データを使用した漂流予測が的中

Challenges for the future

- 漂流予測に使用するに当たり、漂流予測プログラムへどのように導入していくか？
- メッシュサイズの問題
- リアルタイムに導入する方法
- 短波レーダーのデータを使用する範囲
- 風や吹送流に関してどのように考えていくか？