SAR-DRIFT

IROISE SEA TRIALS

Christophe Maisondieu
IFREMER Hydrodynamics and Metocean

Marc Pavec
Actimar
SAR-Drift

Norwegian Meteorological Institute  met.no
Christian Michelsen Research

Supported by:

French-Norwegian Foundation
Norwegian Research Council (NRC)
Agence Nationale pour la Recherche (ANR)
Oseo/Anvar
Iroise Sea Trials

Together with European Interreg project LOSTCONT
- Action de l'Etat en Mer (AEM) (France)
- CEDRE (France)
- SASEMAR (Spain)
- IPTM (Portugal)

« How to deal with containers once reported lost at sea »
Iroise Sea Trials

Site: Iroise Sea (48°15’ N, 5°10’W)
Duration: 2 days (22-23 September 2008)

HF Radars
Wave Buoy « Les Pierres Noires »
(Directionnémal Spectra)

Close to Base
Support vessel: « ALCYON »

Owner: Surf
Chartered by French government
Built: 1982

Length overall: 53 m
Beam: 13 m
Draught: 4.5 m
Bollard pull: 64 t
Towing line: 800 m
Gross tonnage: 1 500 t
Power: 5 280 hp (3 886 kW)
Speed: 14.5 kts
2 propellers
1 bow thruster (370 kW)

Crew: 7

Towing:
1 winch 85 t (brake 150 t)
1 crane (20 t)

current generators 2 x 500 kW
Diesel generators 2 x 185 kVA

FiFi:
2 x 300 m³/hr water jets
1 pump 600 m³/hr

Counter-pollution:
1 sweeping arm
Pump Transrec 250
Drifting object

20 ` Container

Standard dimensions

20’ x 8’ x 8’6 ” (6.1m x 2.44m x 2.59m)

- Max. Gross: 30.5 t
- Tare: 2.23 t
- Max Payload: 28.25 t
- Capacity: 33 m³
Drifting object

20 ‘ Container

- 420 kg lest on floor
- 5.8 m$^3$ floats under ceiling
- Appertures on floor for quick water filling
Drifting object

Measurement:

Wind:
Anemometer on top of container

Current:
HF Radars
Currentmeter attached to container

Waves:
Directional buoy « Les Pierres Noires »
Hindcast models

Container position:
AIS transponder
Argos beacons
Drifting object
Drifting object
Drifting object

Trial Duration : 24 hours
Total drifting distance : 16.8 Naut. miles
Mean speed : 0.7 kts
Environmental data

Currentmeter data :
Mean Local Drift speed :
19.6 cm/s (0.38 kts)

Anemometer data :
Mean wind speed (7 hours):
North-easterly
10 m/s (19.5 kts),
gusts 28 kts
Environmental data

Drift Speed (Speed over Ground):

- Mean: 36.48 cm/s (0.7 kts)
- Std: 16 cm/s
- Large variability

Relative Speed:

- Mean: 19.45 cm/s (0.38 knts)
- Std: 1.6 cm/s
- Steady
Leeway Coefficients

Leeway:

“Leeway is the velocity vector of the SAR object relative to the downwind direction at the search object as it moves relative to the surface current as measured between 0.3m and 1.0m depth caused by winds (adjusted to a reference height of 10m) and waves.”

DWL: Downwind Leeway Coefficient
CWL: Crosswind Leeway Coefficient
Sardrift Tools

SAR-Drift forecast tool

SAR-DRIFT

– Drift in Iroise Sea –

Simulation start :
2008–09–22 13:00

Simulation end :
2008–09–23 12:00

km

Probability of presence

Observed trajectory
Predicted trajectory
Sardrift Tools

FORECAST

HF Radar
Sardrift Tools

Sensitivity of the model: Influence of Draught

70%  80%  90%
Conclusions

Experiment:
- Container handling
- Visibility at night
- Large cooperation

Data analysis:
Only one reference in a very small database (2nd trial in 15 years)

Forecast model:
- good ability to forecast drift for several hours
- requires high quality current and wind forecast