

The High-Latitude Landfall of Hurricane Larry (2021) in Newfoundland, Canada

7B.8 - 35th AMS Conference on Hurricanes and Tropical Meteorology

May 10, 2022

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Outline

- **Historical/climatological context**
- **Data and Imagery**
- **Forecasts and Impacts**
- **CHC/NHC Partnership**

80°W 75°W 70°W 65°W 60°W 55°W 50°W 45°W 40°W 35°W 30°W 25°W 20°W 15°W 10°W 5°W 0° 5°E

Hurricane Larry
31 Aug - 11 Sep 2021

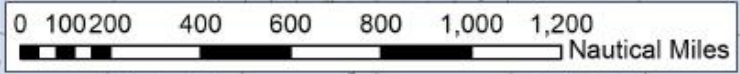
- Major Hurricane
- Hurricane
- Tropical Storm
- Tropical Depression
- Subtropical Storm
- Subtropical Depression
- - - Wave/Low/Disturbance
- +++ Extratropical
- 0000 UTC Position
- ^{dd} 1200 UTC Pos/Date
- PPP Minimum Pressure

~70 kts

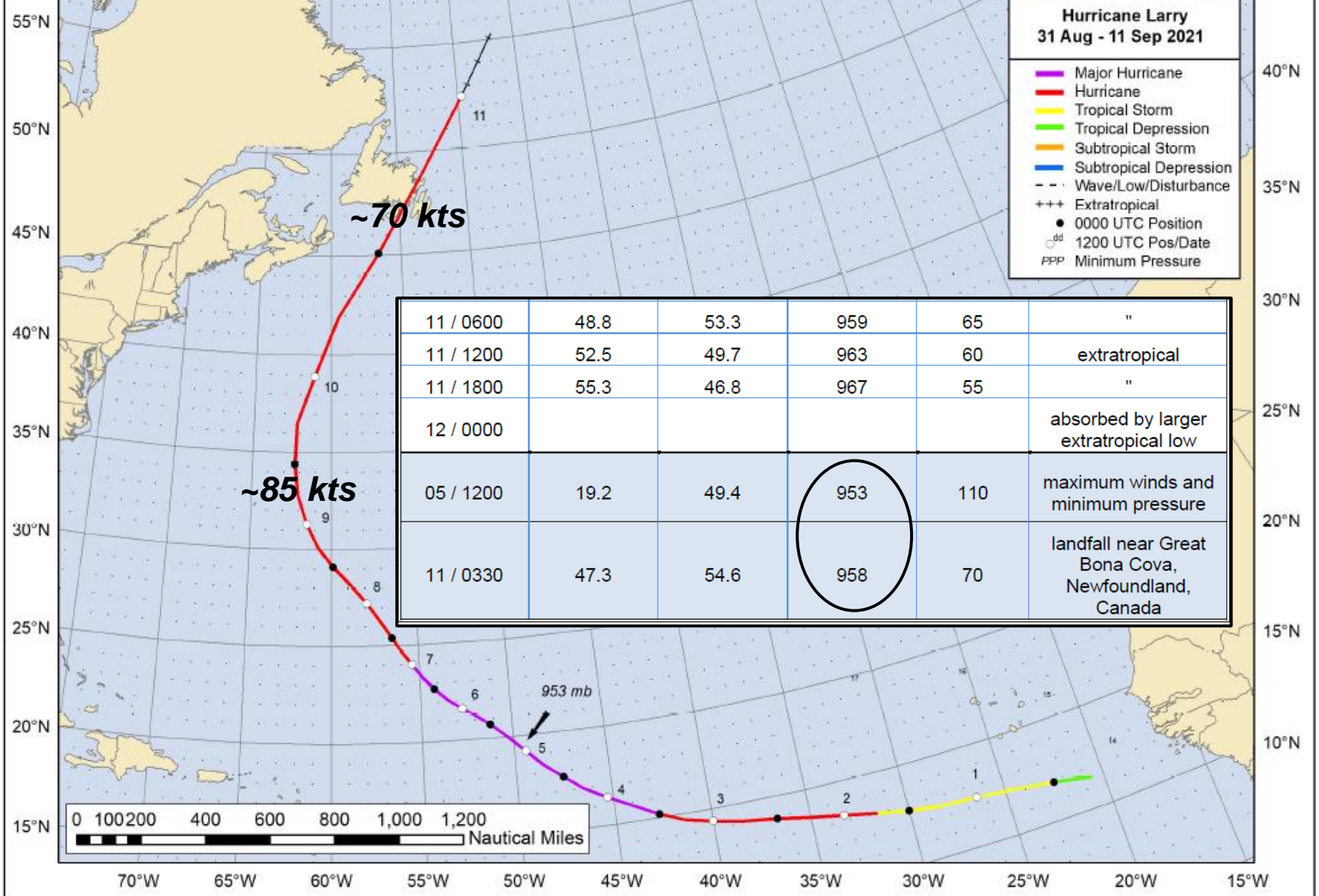
~85 kts

11 / 0600	48.8	53.3	959	65	"
11 / 1200	52.5	49.7	963	60	extratropical
11 / 1800	55.3	46.8	967	55	"
12 / 0000					absorbed by larger extratropical low
05 / 1200	19.2	49.4	953	110	maximum winds and minimum pressure
11 / 0330	47.3	54.6	958	70	landfall near Great Bona Cova, Newfoundland, Canada

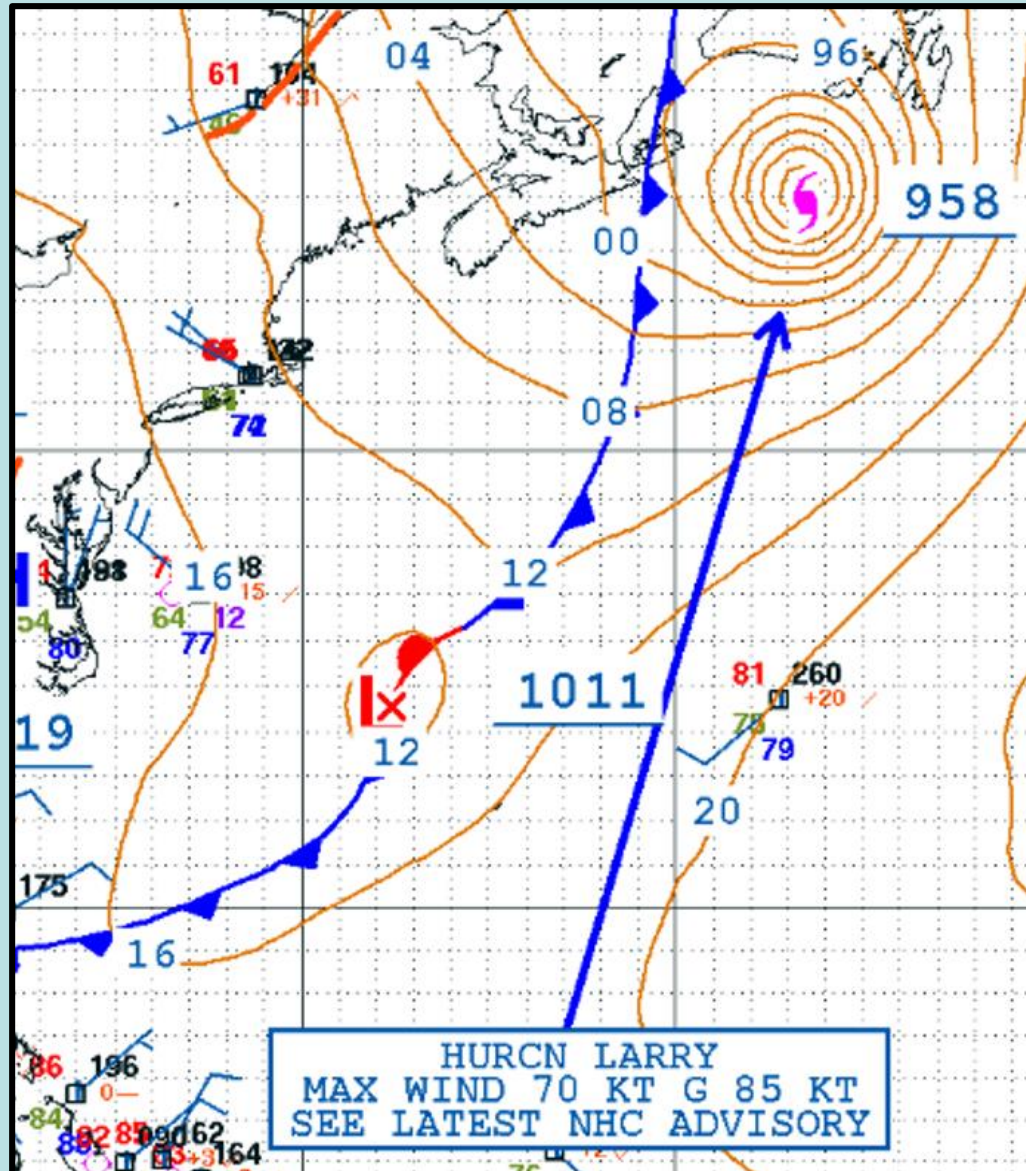
953 mb



70°W 65°W 60°W 55°W 50°W 45°W 40°W 35°W 30°W 25°W 20°W 15°W

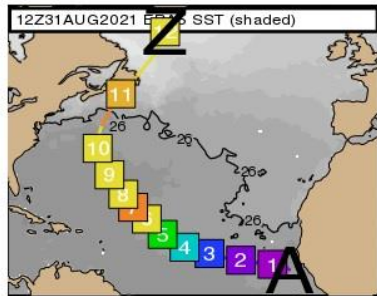


Surface Analysis ~3 hours pre landfall



Cyclone Phase Reanalysis

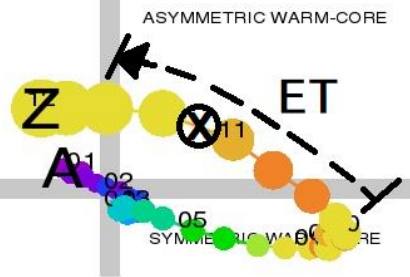
CPS data: Bob Hart - FSU



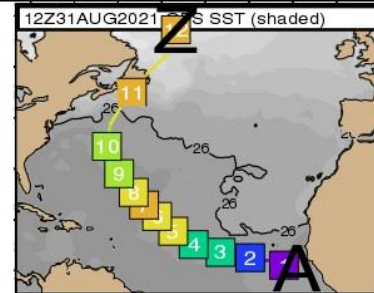
ERA-A
.25deg

Landfall = ⊗

ASYMMETRIC COLD-CORE



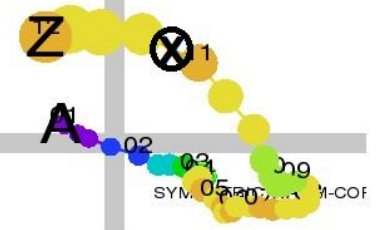
SYMMETRIC COLD-CORE



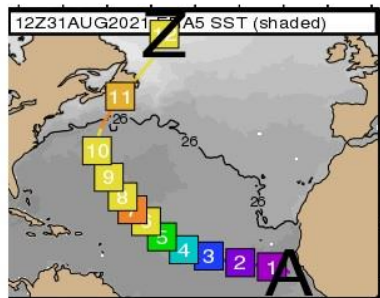
GFS-A
.5deg

ASYMMETRIC WARM-CO

ASYMMETRIC COLD-CORE

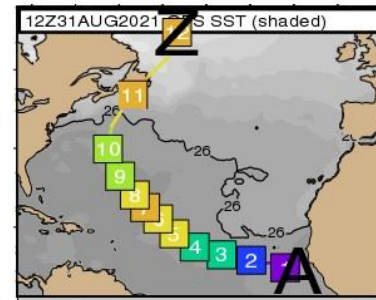
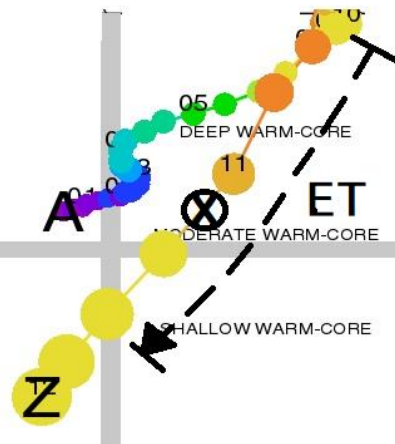


SYMMETRIC COLD-CORE



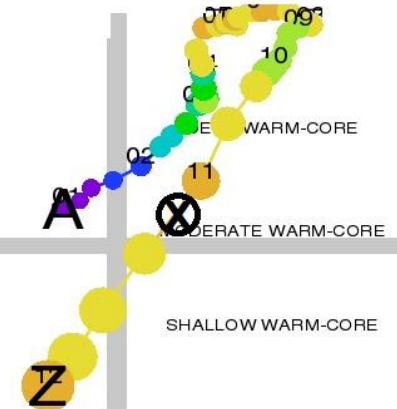
ERA-B

DEEP COLD-CORE



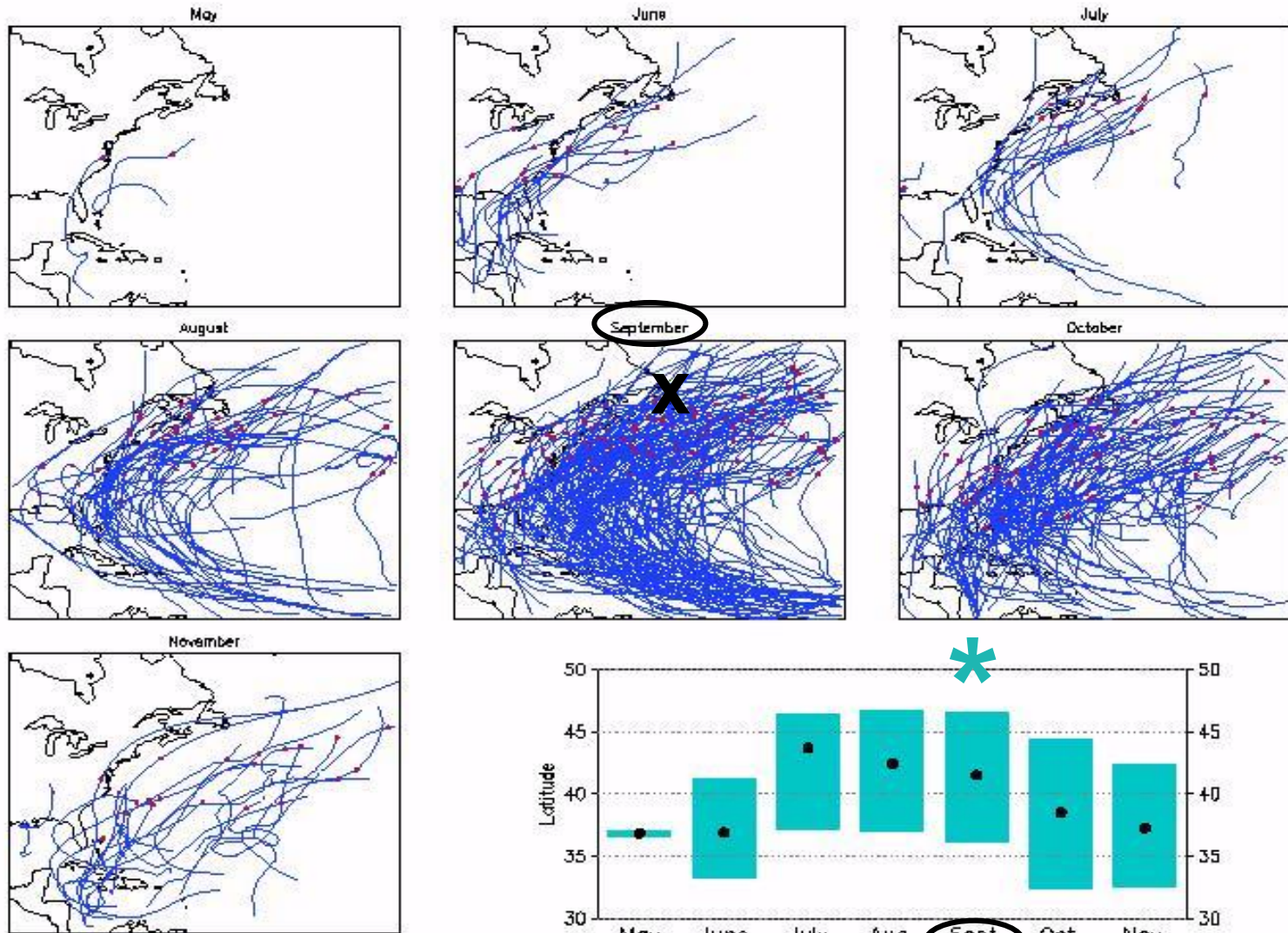
GFS-B

DEEP COLD-CORE

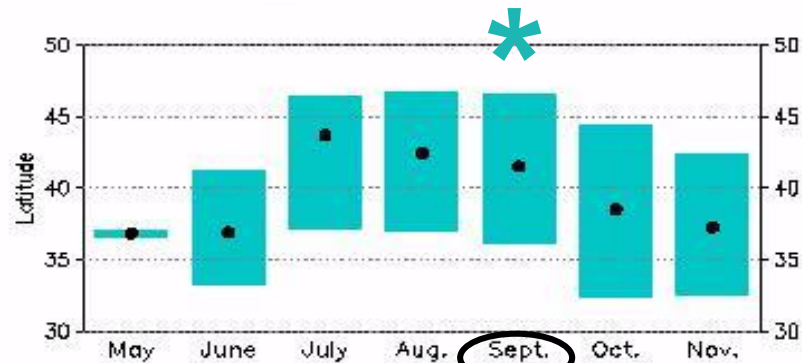


Larry compared to climatology

TRACKS OF EXTRATROPICALLY TRANSITIONING CYCLONES BY MONTH 1899 - 1996



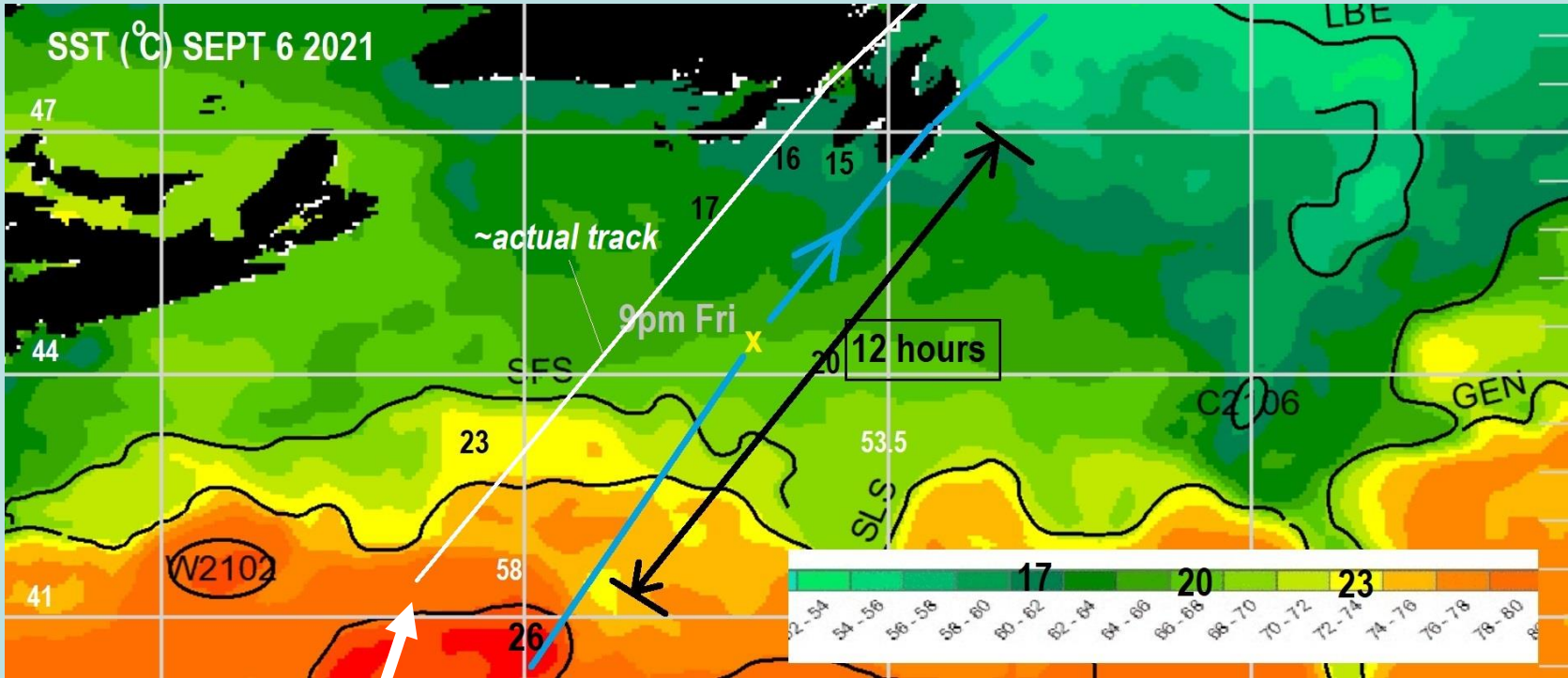
Red dot = point of transition (NHC)



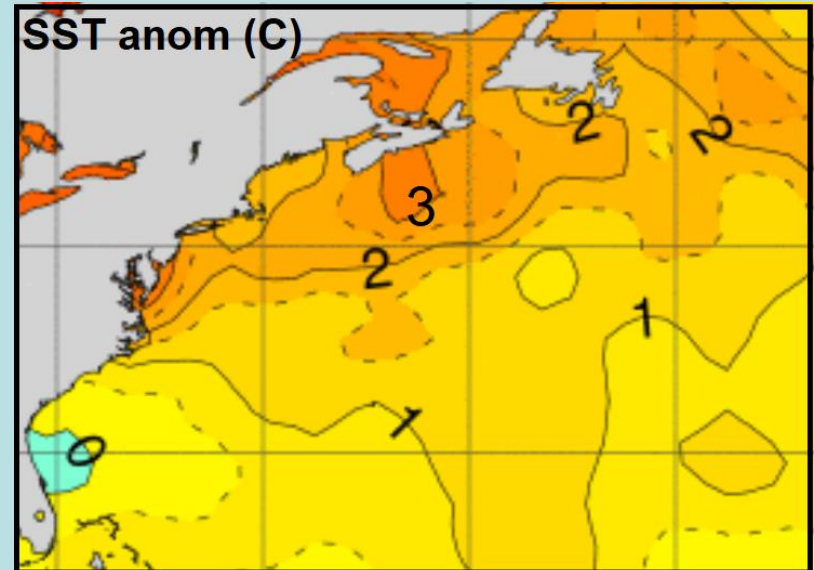
Latitudinal range of transition by month

Hart and Evans (2001)

Sea Surface Temperatures (observed, anomaly)



***Max winds only decreased
~15 kts over this segment
of the storm's track***

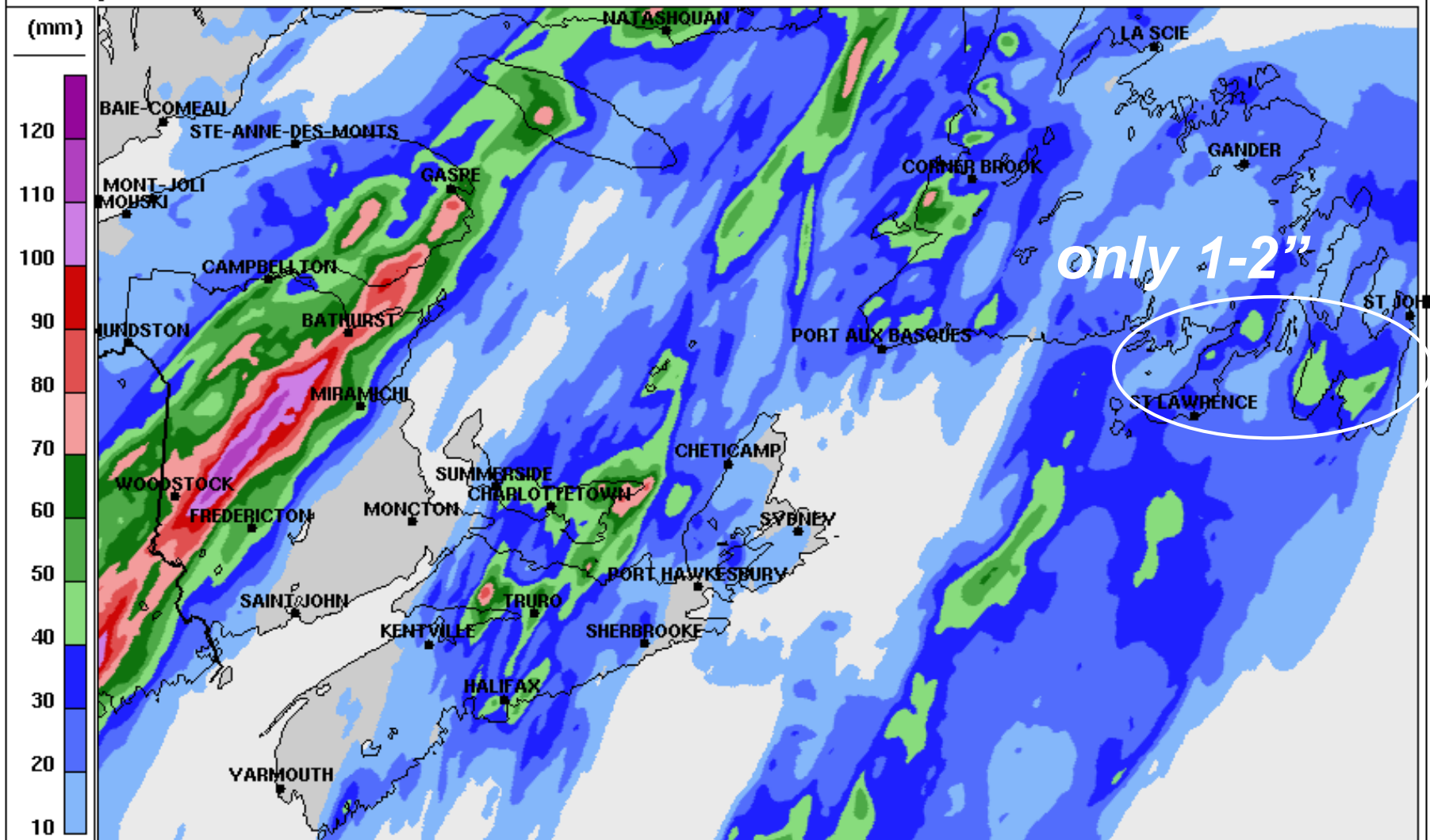


Total precipitation: 48hrs vld 20210911 06UT
Précipitation totale: 48hrs vld 20210911 06TU



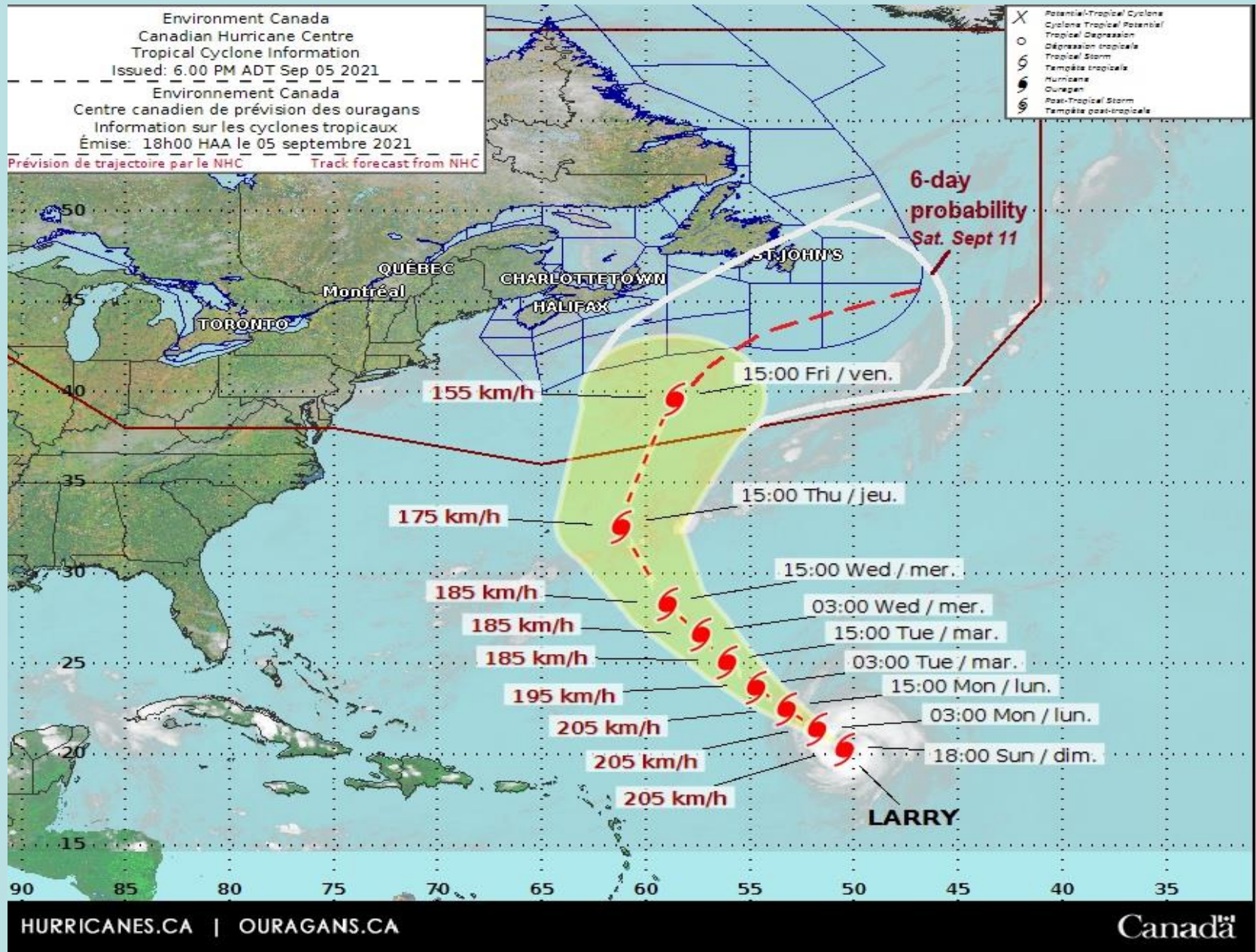
Gouvernement
du Canada

Government
of Canada

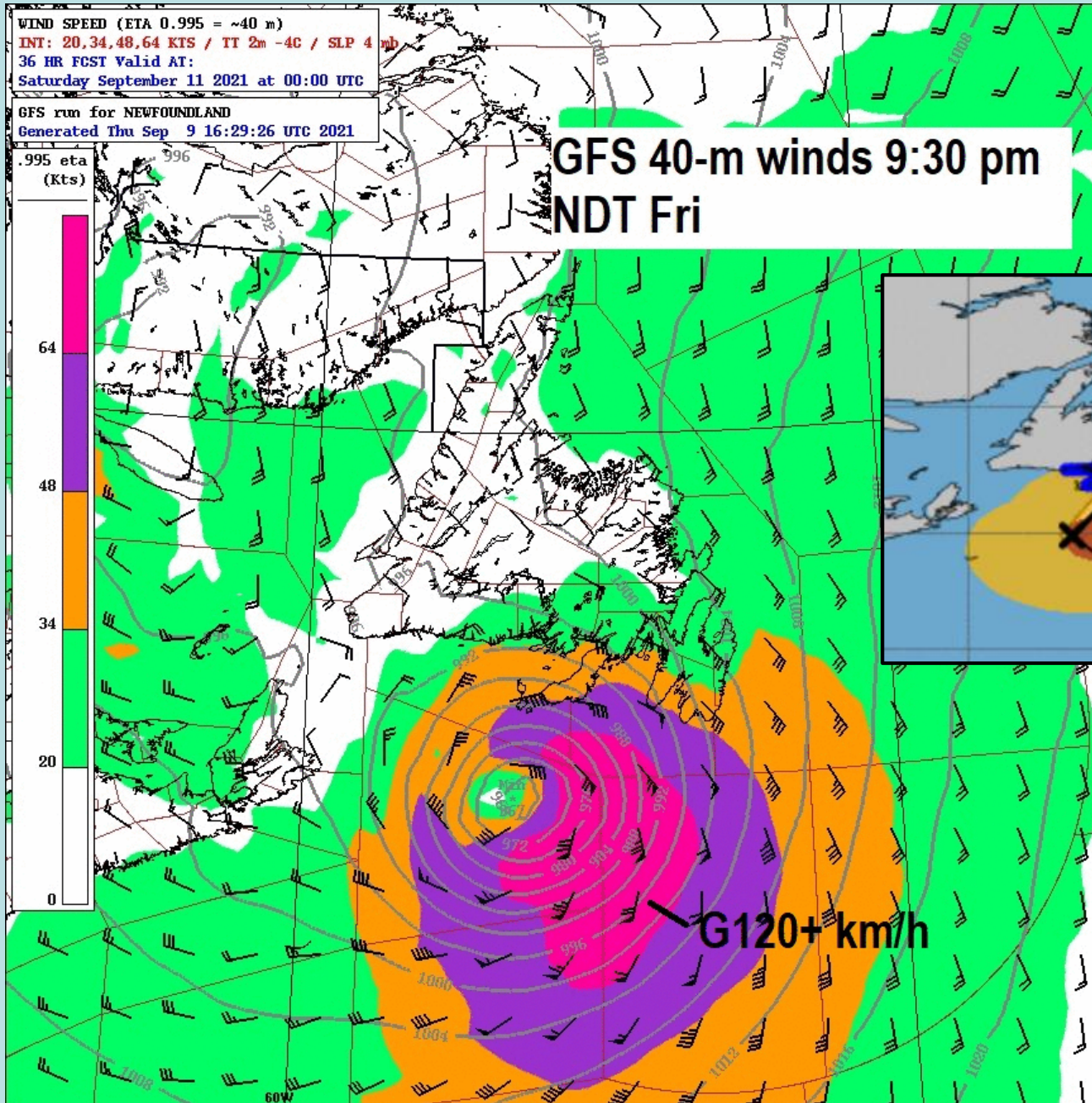


ECCC 2.5-km Precip Analysis (gauge, radar and model data) / Analyse de précip à 2.5 km d'ECCC (données: jauges, radars et modèle)

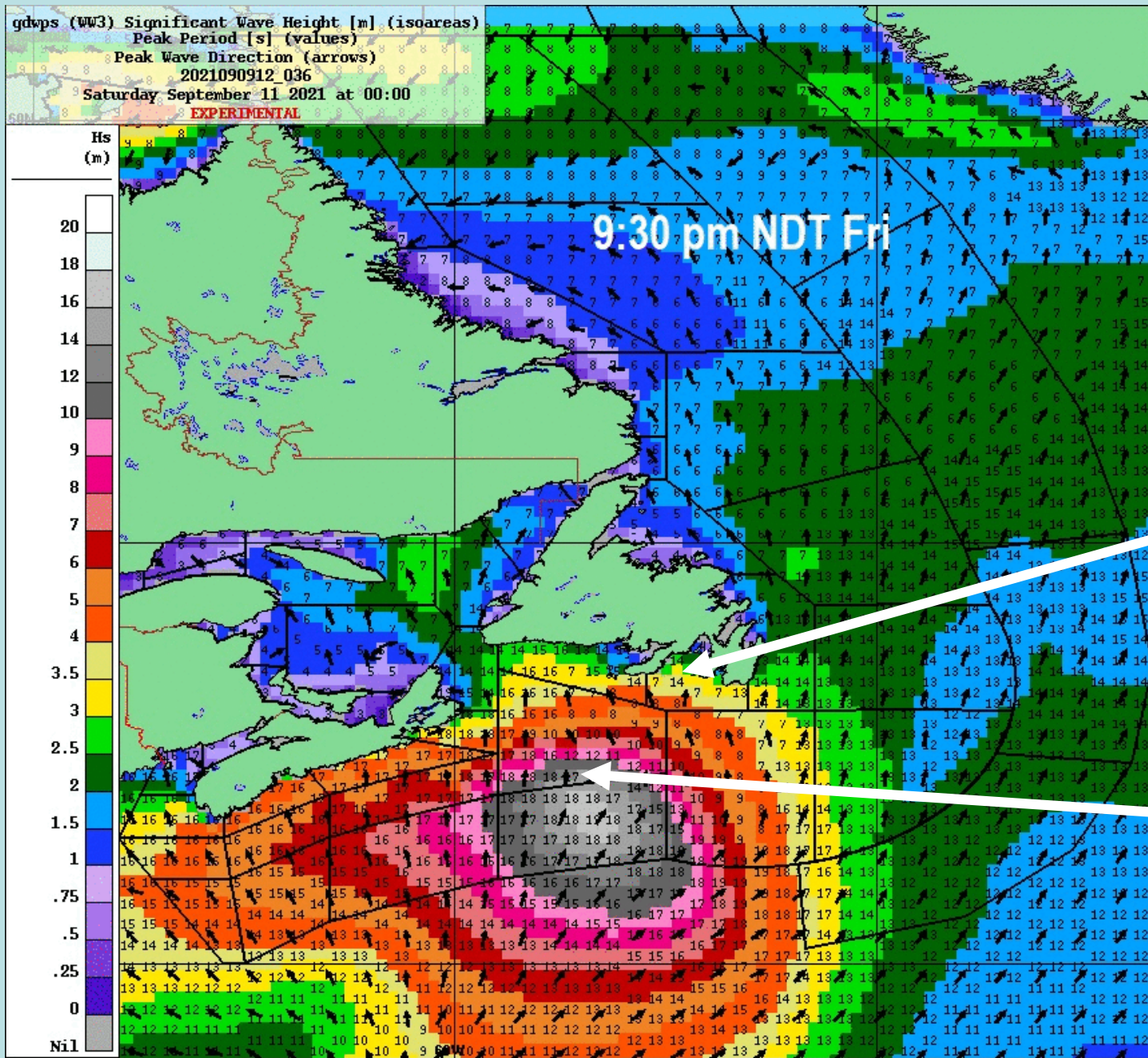
Very good track forecast – within cone 5-6 days out



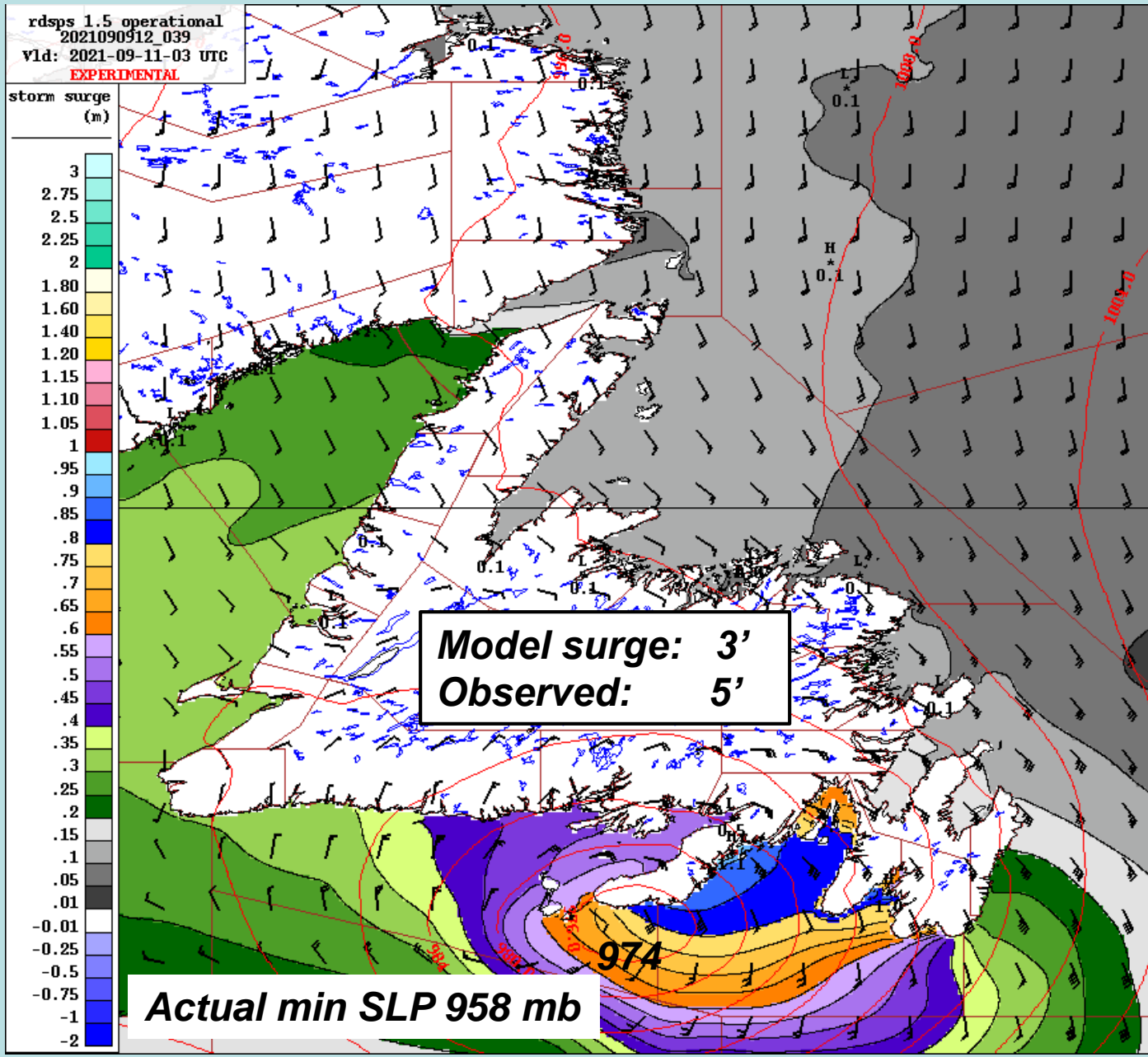
GFS ~1.5-day Forecast Winds

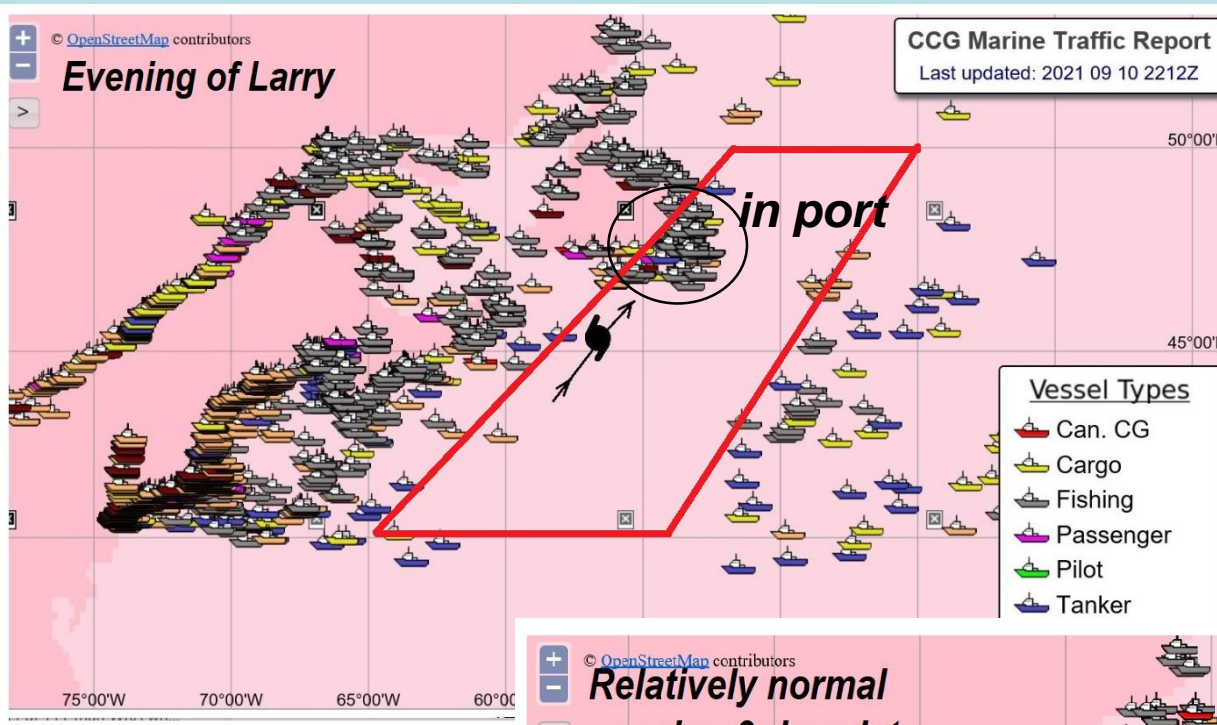


Canadian GLB ~1.5-day Sea State Forecast

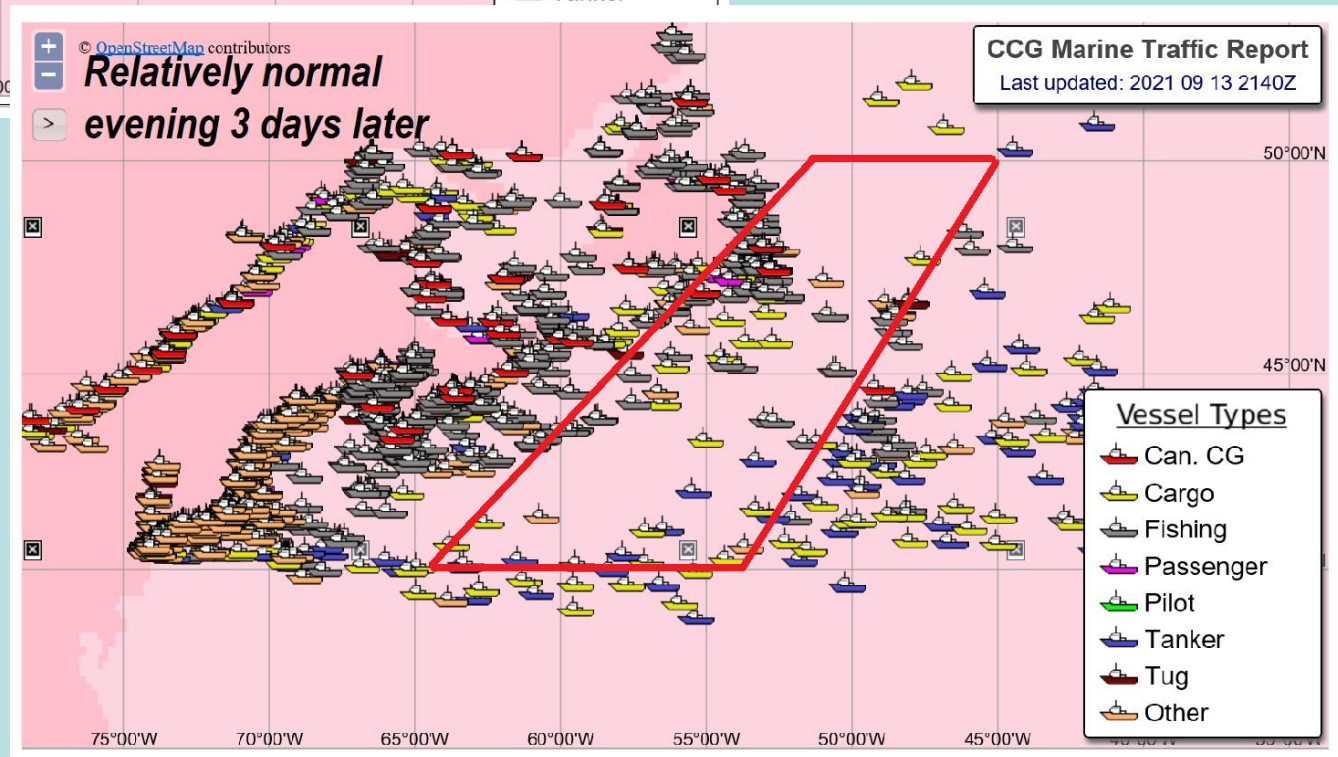


Canadian REG ~1.5-day Surge Forecast





Forecast
Impact on
marine vessel
traffic



Surge and Waves



Wind





Wind



Event was cancelled based on forecasts

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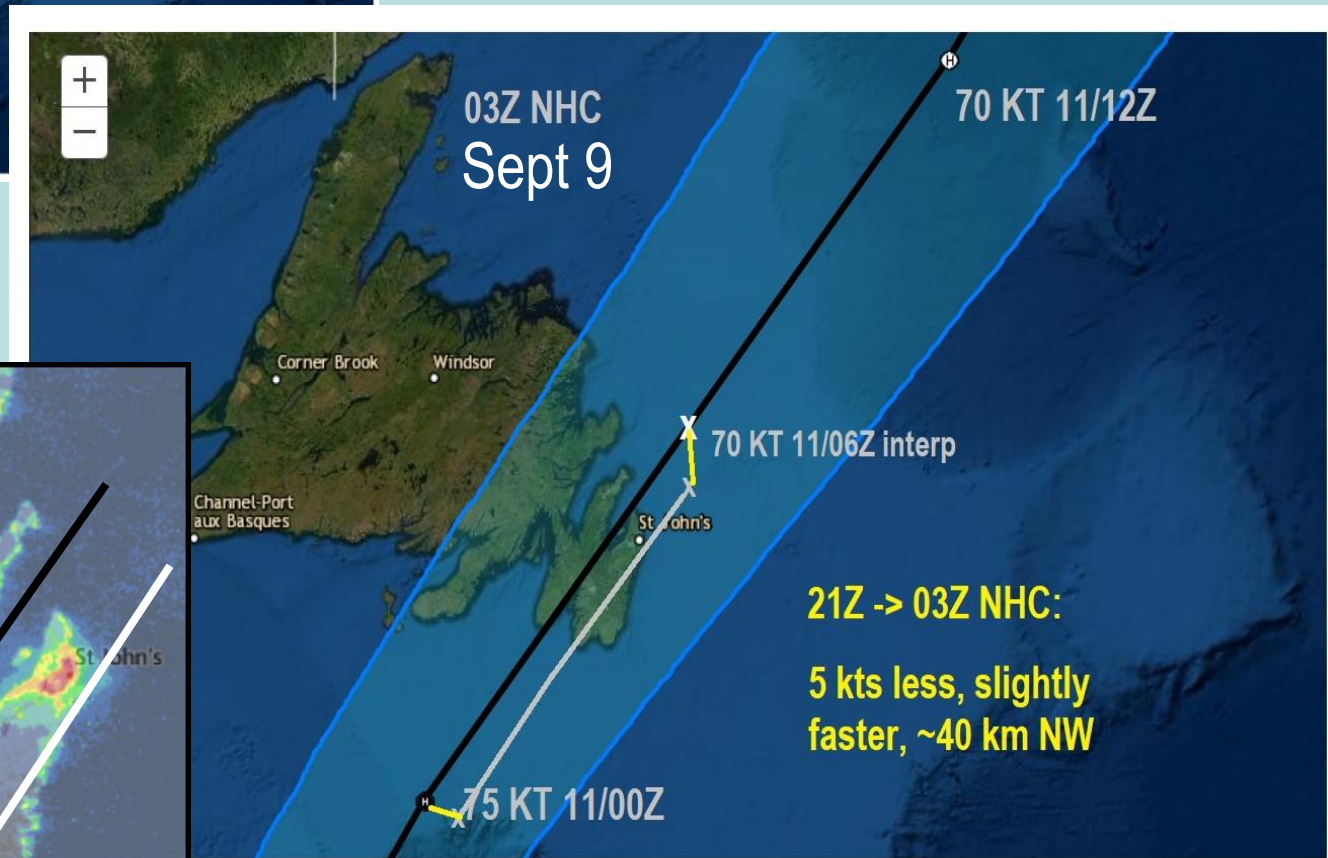
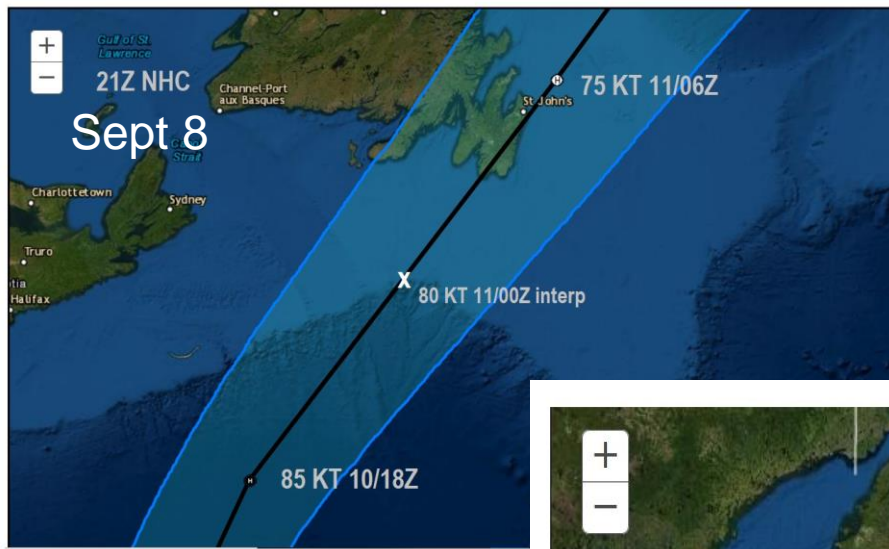
Good thing!

CHC / NHC Partnership

- **CHC and NHC videoconferencing began in 2021 – previously only by phone, email or ‘chat’ software (began 3.5 days before Larry landfall)**
- **Coordination of intensity and positions for consistency (*next (final) slide*)**
- **Frequent coordination (mostly email) for final storm report (TCR) prepared at both agencies**
- **report authors worked *directly* whilst in the past would go through CHC Director (unnecessary middle man)**

Coordination is key!

Consistency in track nodes



21Z -> 03Z NHC:

5 kts less, slightly
faster, ~40 km NW

