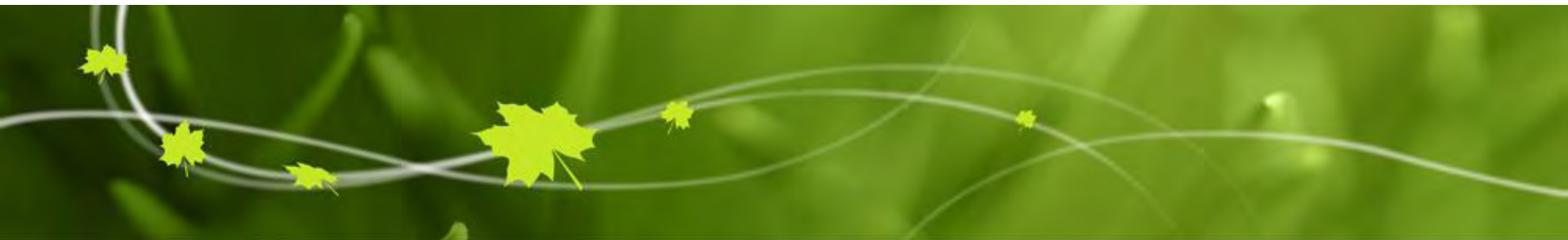




Environment
Canada

Environnement
Canada

Canada



Hurricanes in Canada

Institute for Catastrophic Loss Reduction

Bob Robichaud

Warning Preparedness Meteorologist

Canadian Hurricane Centre

Environment Canada

June 17th, 2011

Contents

- Introduction to Tropical Cyclones
- Historic Storms in Canada
- Summary of the 2010 Hurricane Season
- Outlook for the 2011 Hurricane Season
- Canadian Hurricane Centre Product changes for 2011

What is a Tropical Cyclone?

Hurricane Earl - 2010

A **tropical cyclone** is a non-frontal (no cold part of the storm) low-pressure system over tropical or sub-tropical waters with organized thunderstorm activity and definite surface wind circulation

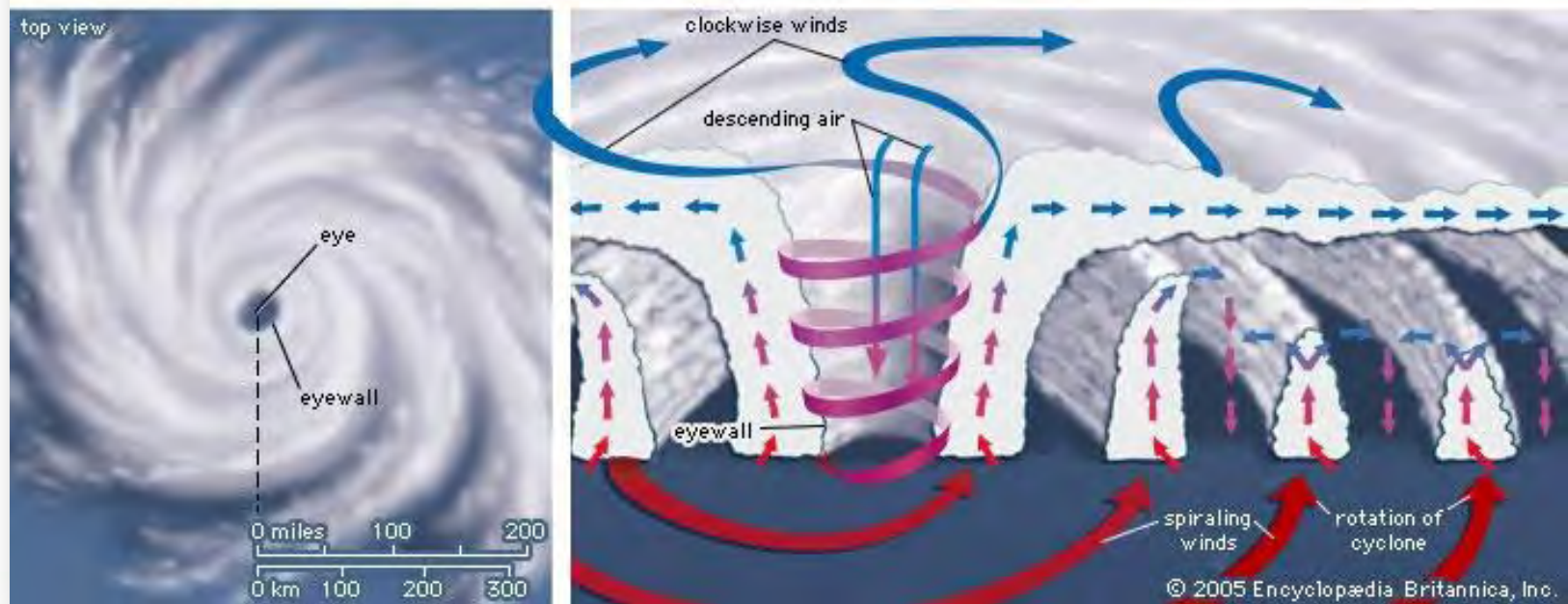
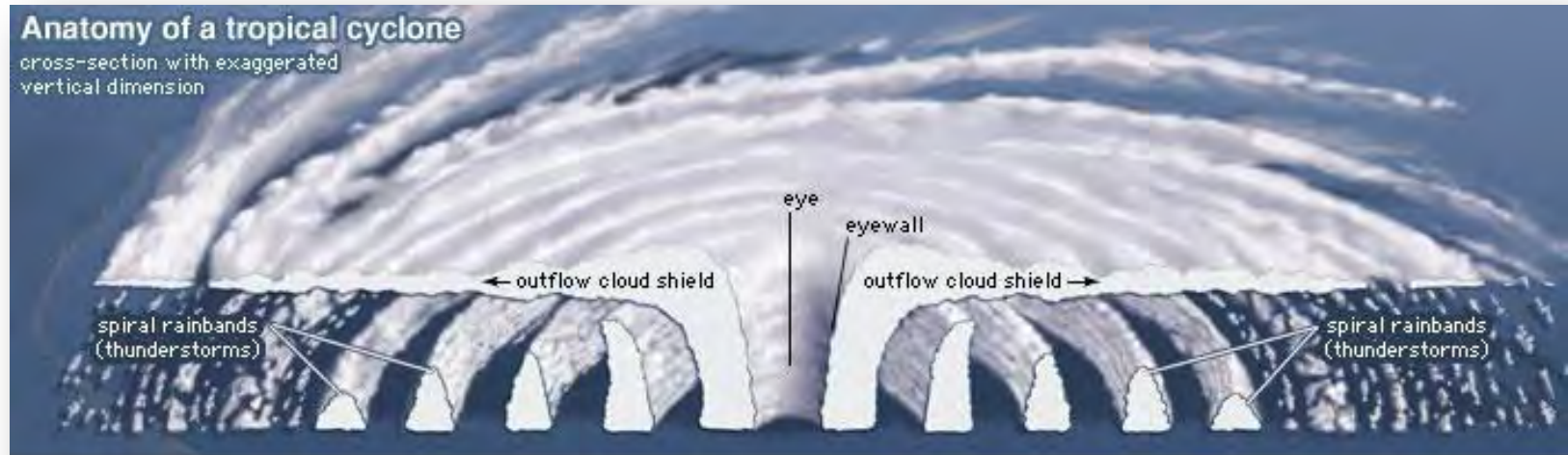
Tropical Cyclones are driven by heat in ocean

Extratropical or "regular" storm is driven by the difference in air temperature

A "**hurricane**" is a regionally specific name for a strong "tropical cyclone".



What is a Tropical Cyclone?



How to build a tropical cyclone

Mechanical

1) A pre-existing disturbance



2) Location several degrees north of the equator (spin)



3) Little change in wind speed and/or direction with height (no wind shear)



Thermodynamic

4) Warm sea-surface temperatures (usually at least 26°C)



5) Unstable atmosphere (temperature goes down as you go up)



6) High atmospheric moisture content (relative humidity)

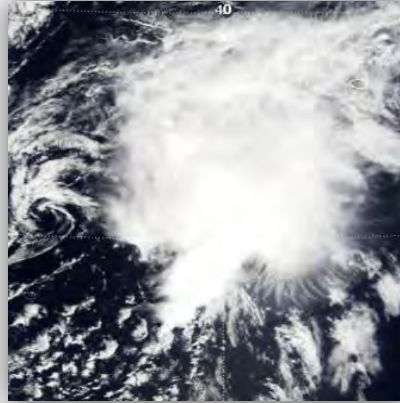


Stages of Development

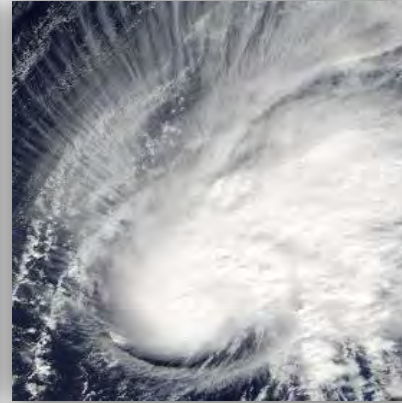
Tropical Disturbance
Wind < 37 km/h (23 mph)



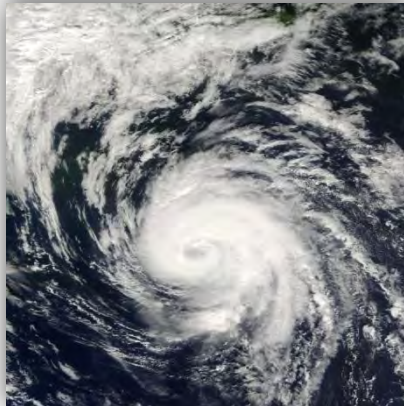
Tropical Depression
Wind 37+ km/h (23 mph)



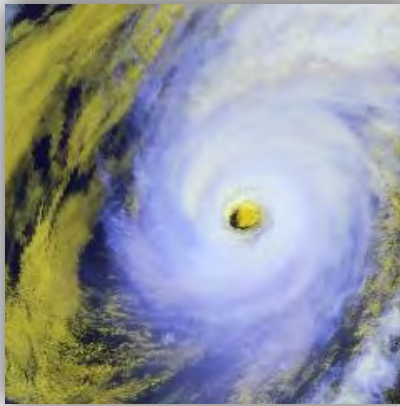
Tropical Storm
Wind 63+ km/h (39 mph)



Hurricane – Cat. 1
Wind 119+ km/h (74 mph)



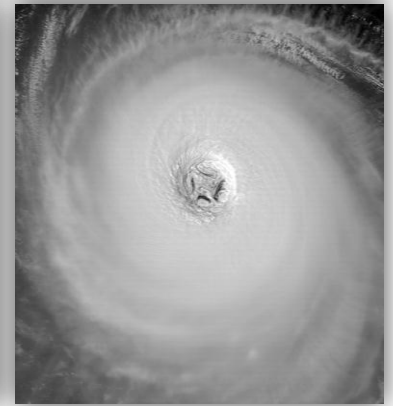
Wind 154+ km/h (96 mph)
Hurricane – Cat. 2



Wind 178+ km/h (111 mph)
Hurricane – Cat. 3

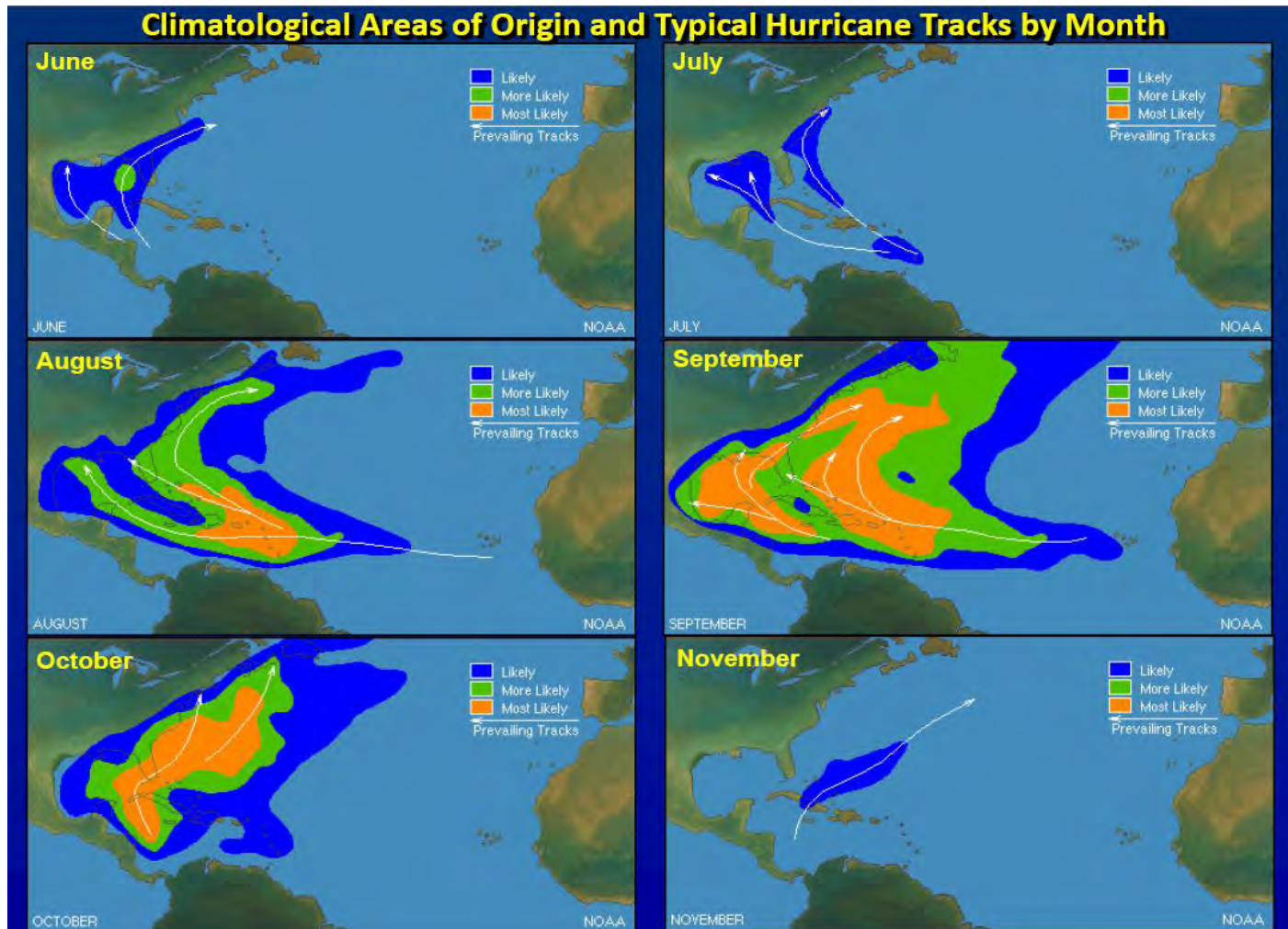


Wind 211+ km/h (131 mph)
Hurricane – Cat. 4



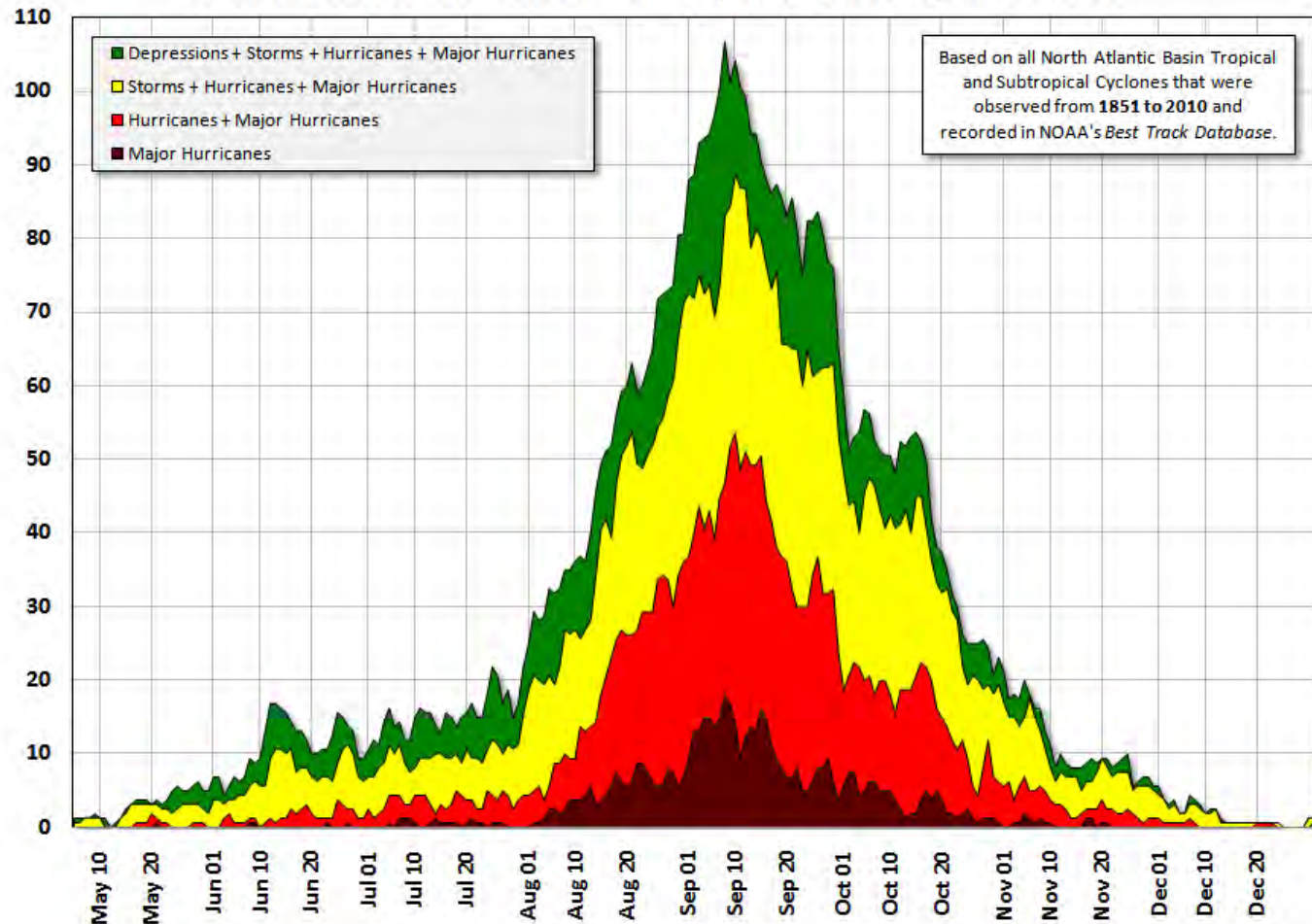
Wind > 251 km/h (156 mph)
Hurricane – Cat. 5

Areas of Origin and Typical Hurricane Tracks by Month



Tropical Cyclone Climatology

Number of North Atlantic Basin Tropical Cyclones per 100 Years



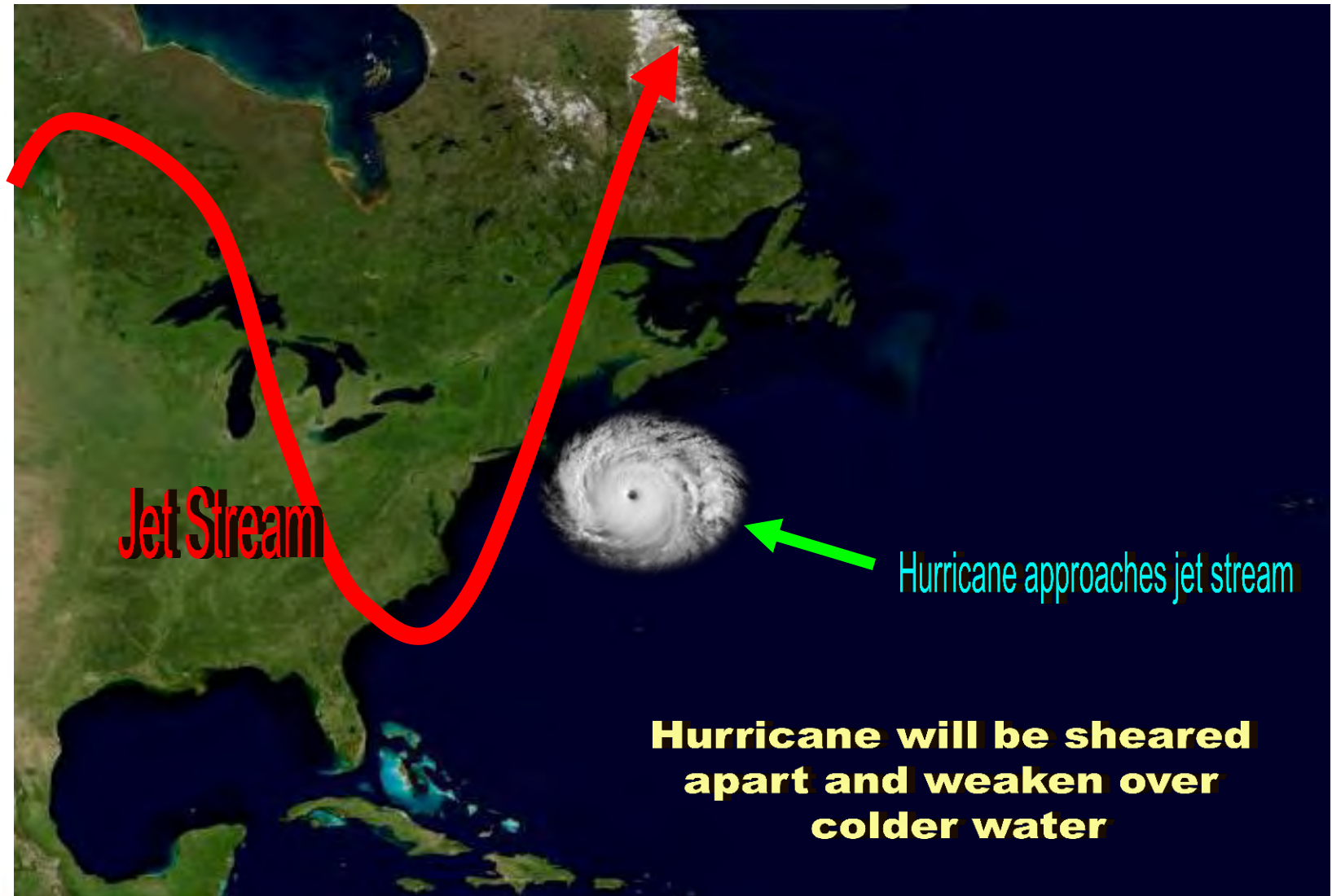
What can happen to a tropical cyclone?



What can happen to a tropical cyclone?



What can happen to a tropical cyclone?



What can happen to a tropical cyclone?



Jet Stream

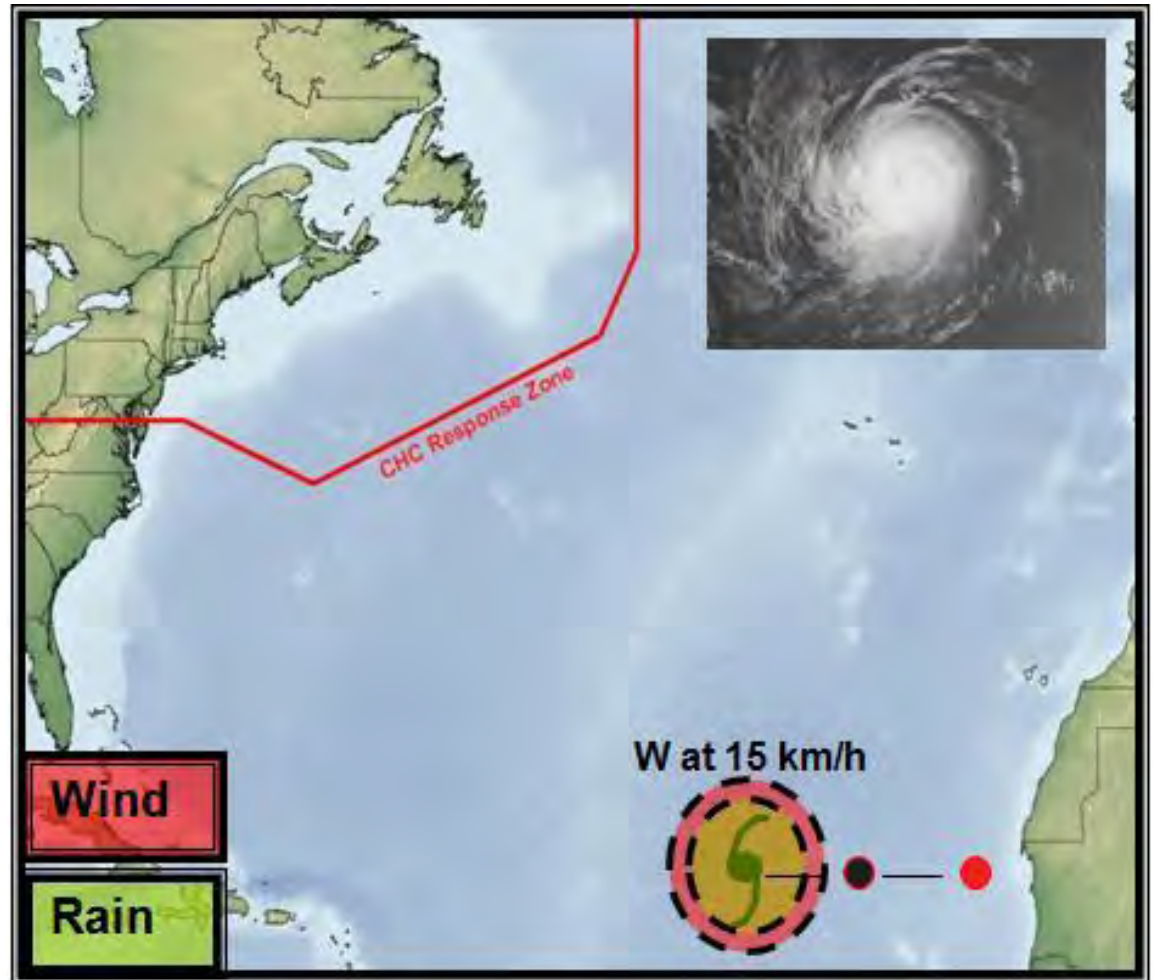
Hurricane will tend to get "picked up" by the jet stream. Extratropical transition occurs with re-intensification likely

Hurricane moves towards the southern tip of the jet stream

Tropical Cyclone Stages- Hurricane

Day 3 (after formation)

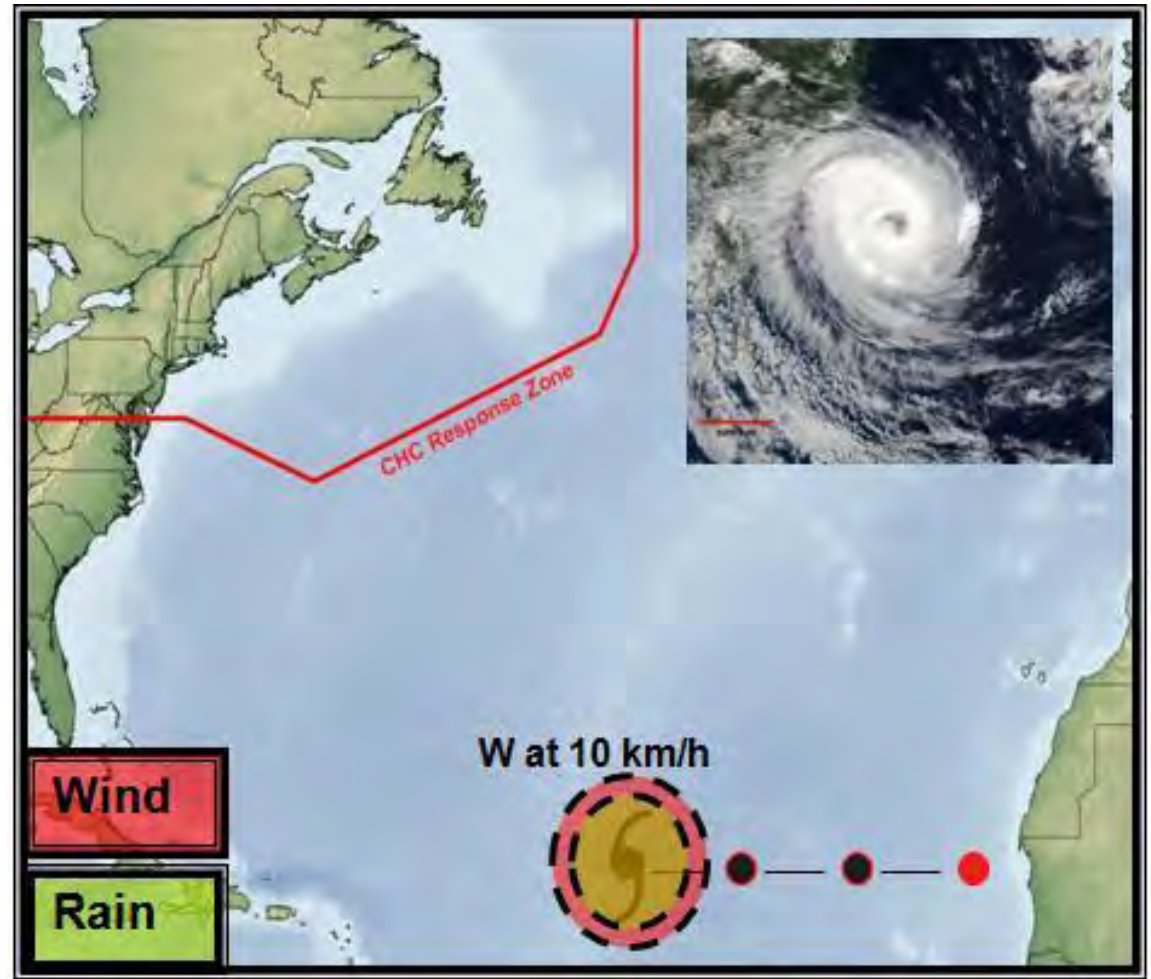
- Hurricane moves westward with the trade winds
- Rain and wind patterns symmetric around the centre



Tropical Cyclone Stages – Category 2

Day 6

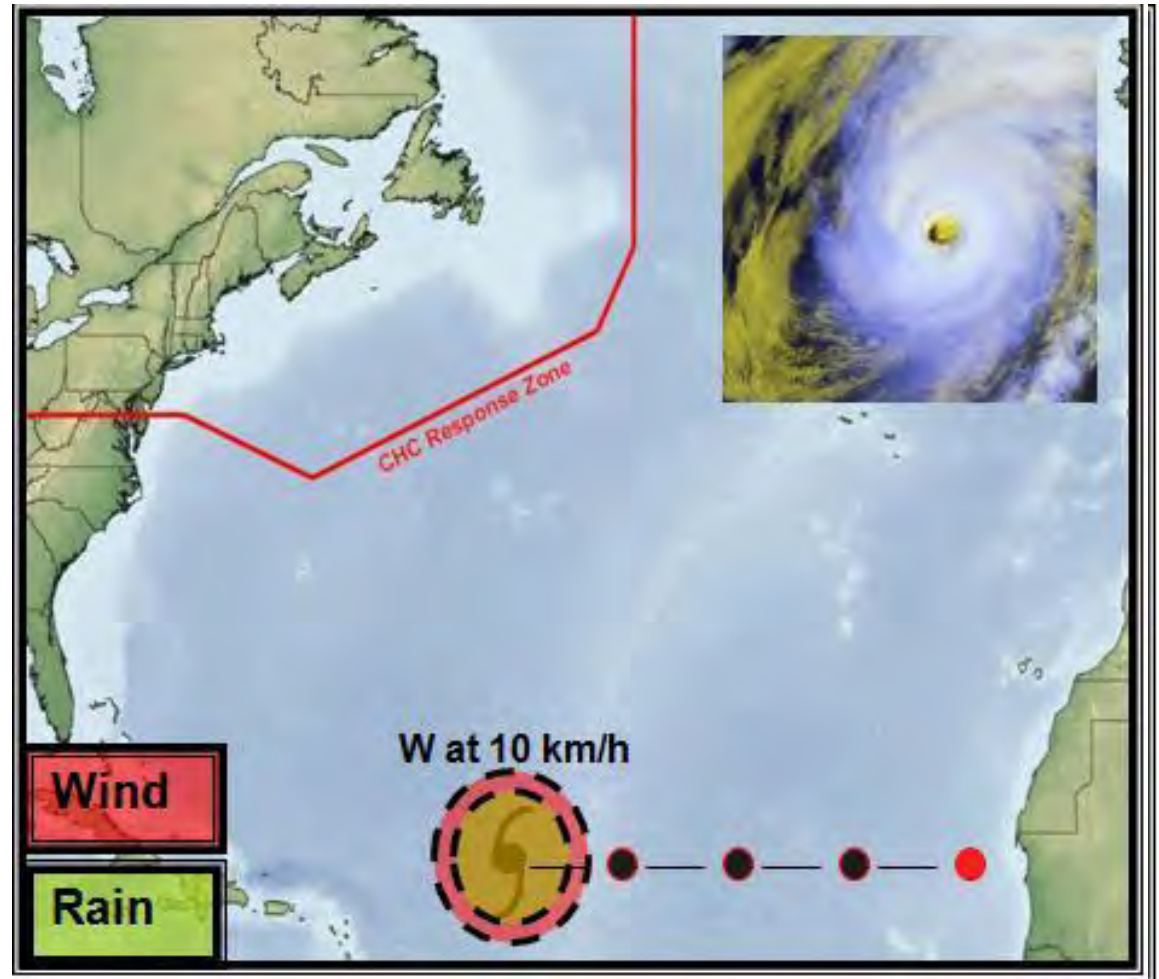
- Hurricane continues to move slowly westward with the trade winds
- Rain and wind patterns symmetric around the centre



Tropical Cyclone Stages- Category 3

Day 9

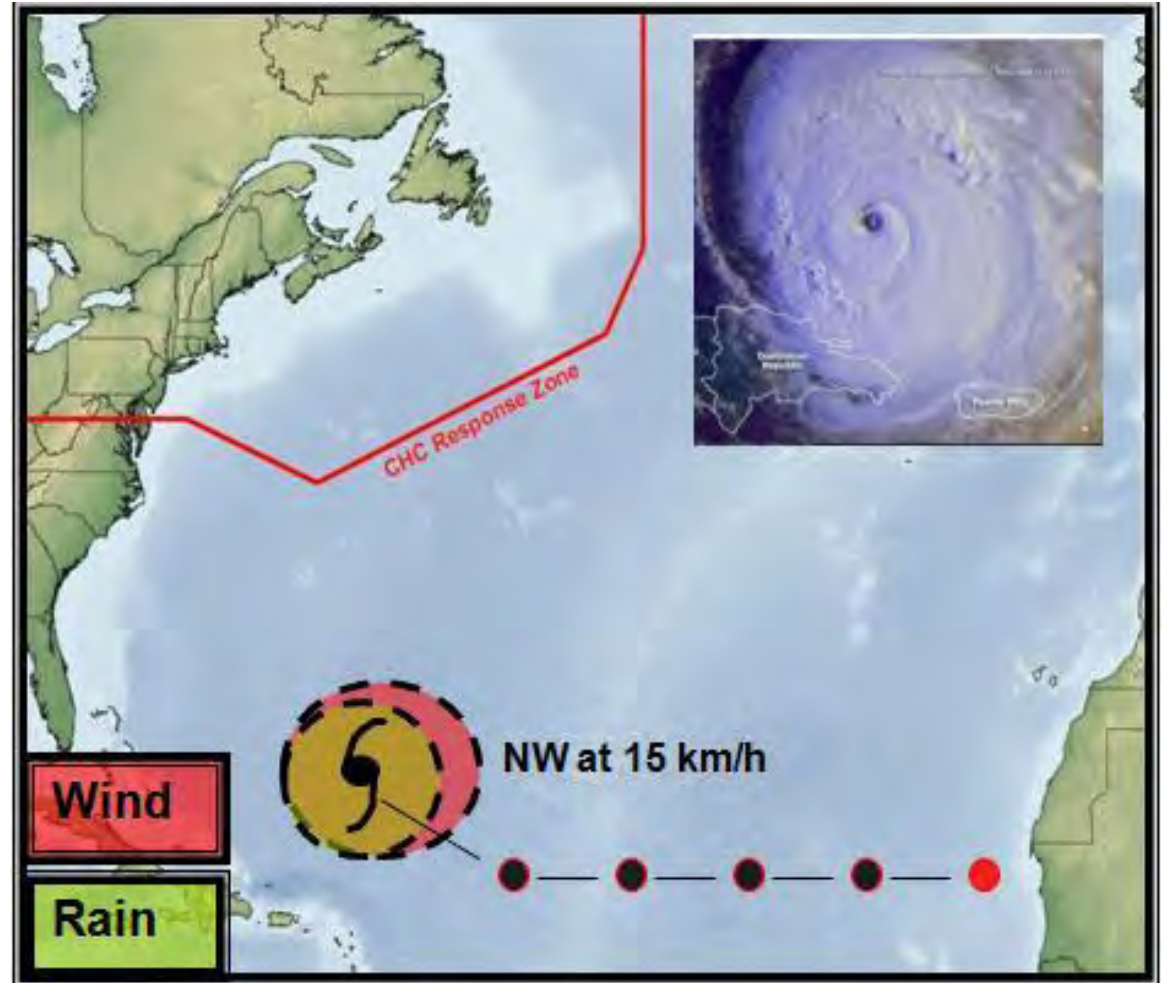
- Hurricane continues to move slowly westward with the trade winds
- Rain and wind patterns symmetric around the centre



Tropical Cyclone Stages- Category 4

Day 12

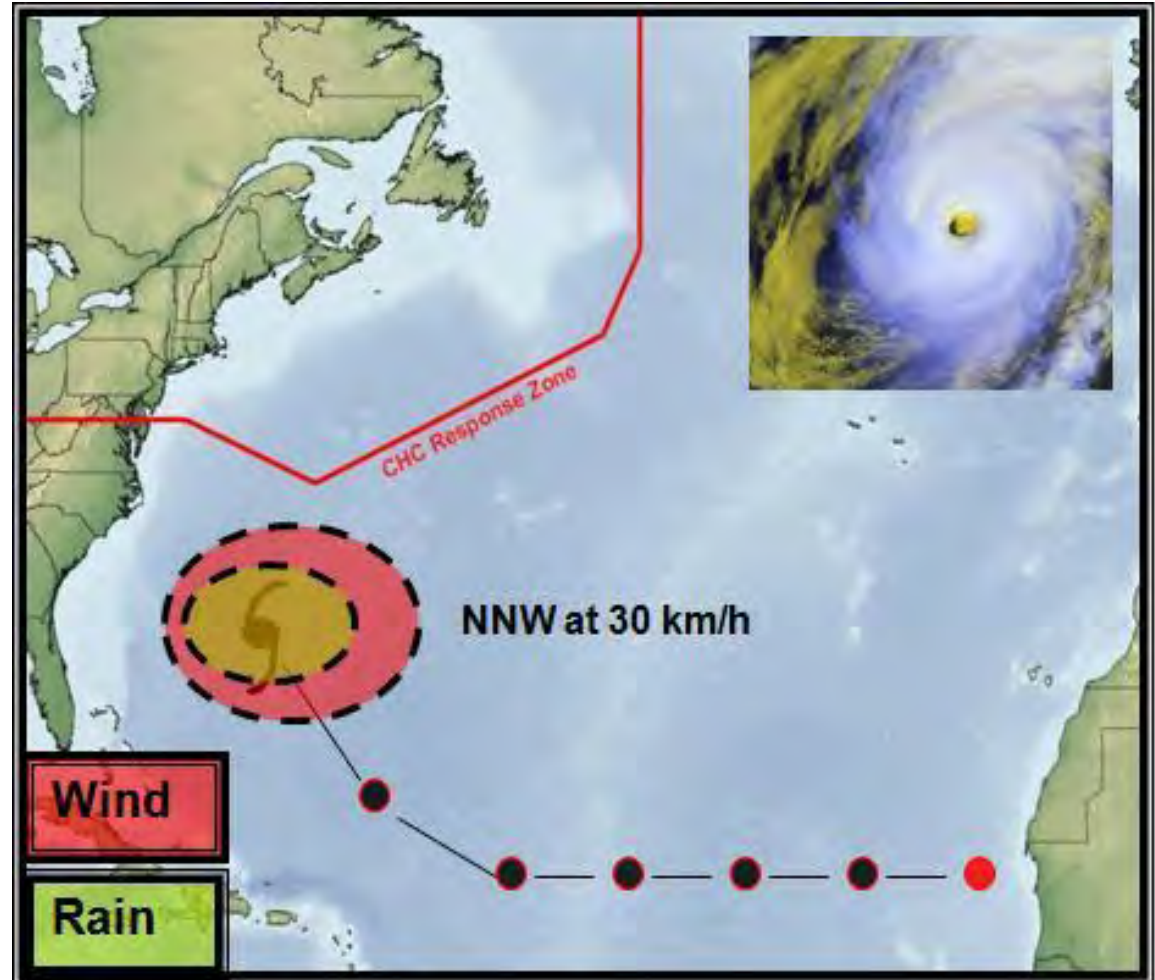
- Hurricane begins to turn right and accelerate as it is influenced by the Bermuda High
- Rain and wind pattern symmetric around the centre but wind pattern begins to skew towards right of track



Tropical Cyclone Stages- Category 3

Day 14

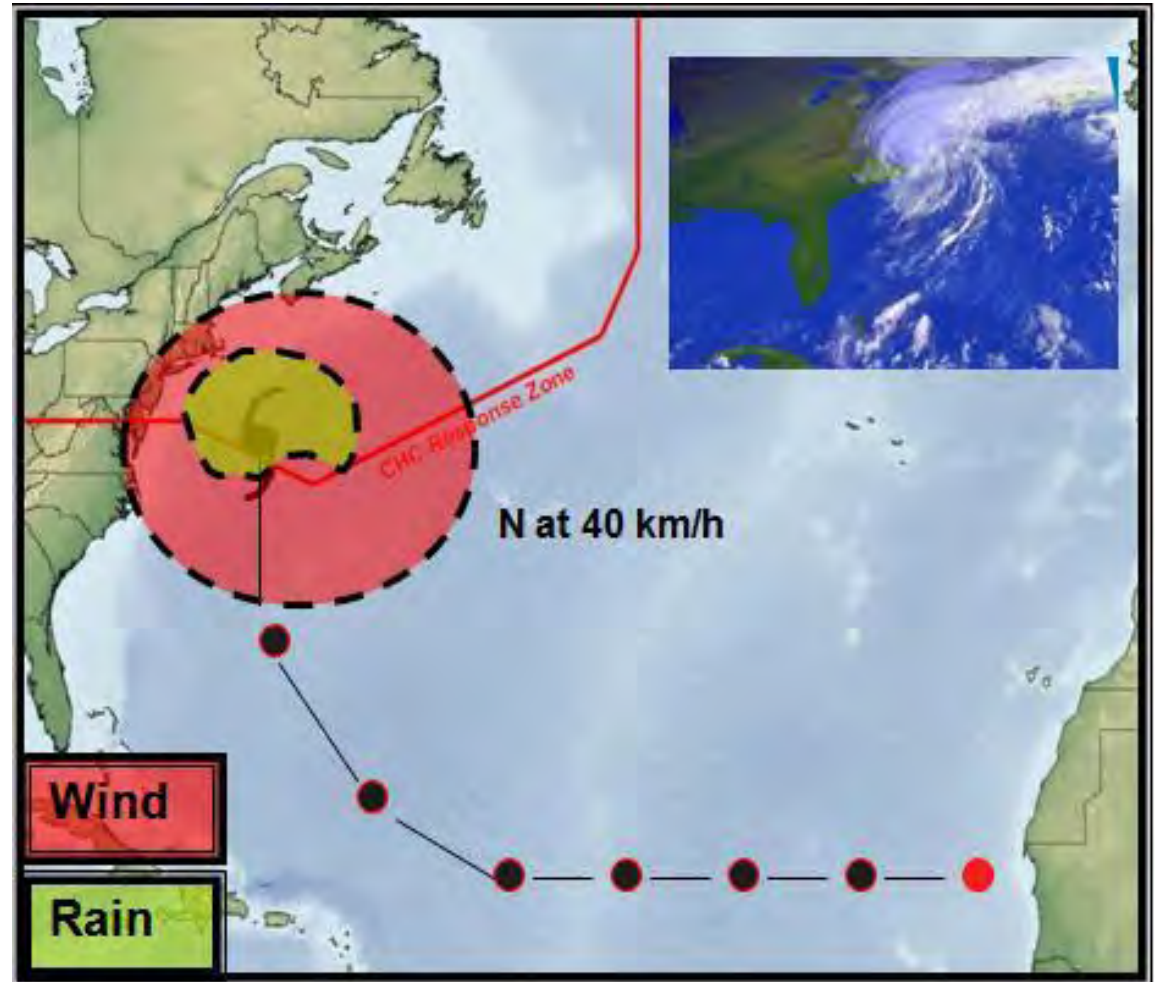
- Hurricane continues to accelerate and turn towards the right
- Rain pattern symmetric but wind pattern begins to expand



Tropical Cyclone Stages- Transition

Day 16

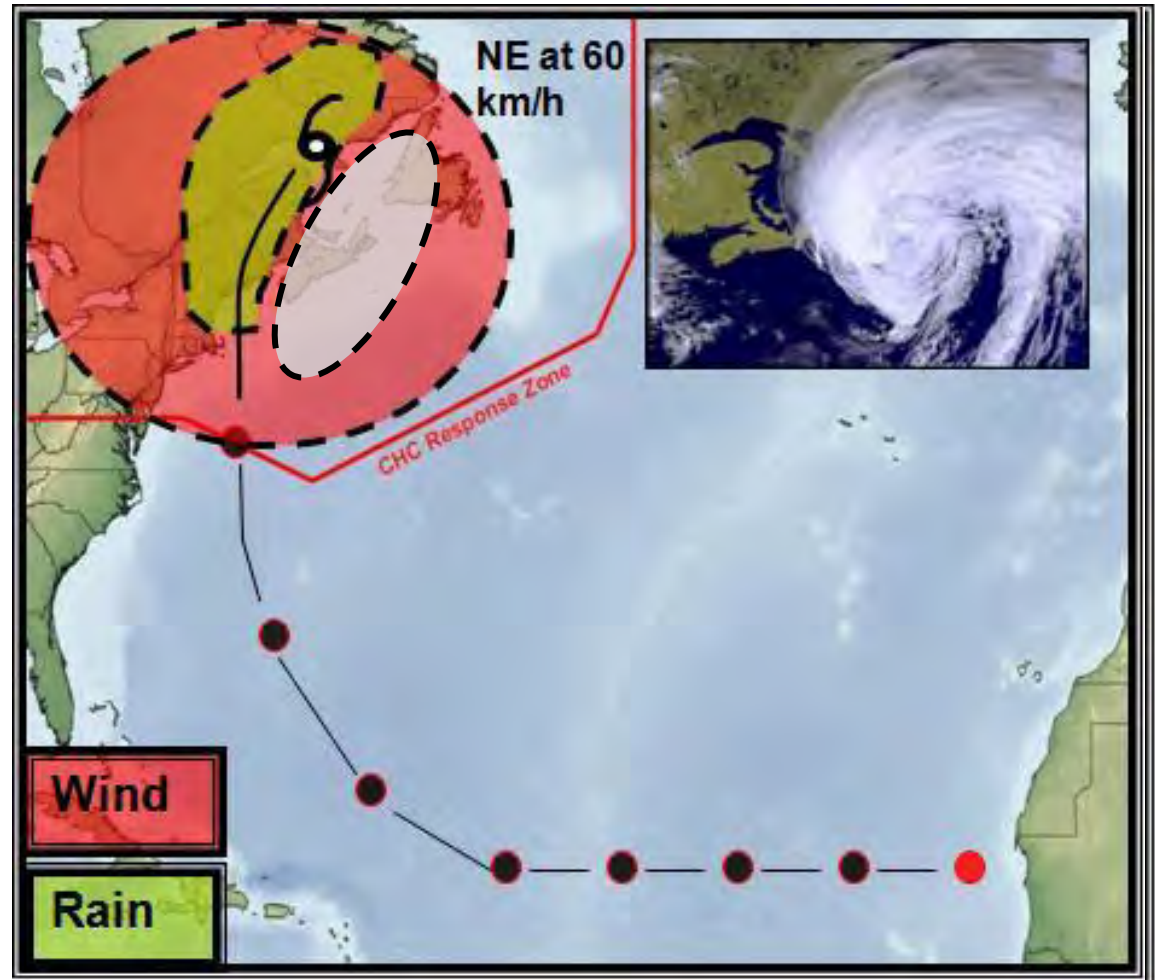
- Storm continues to accelerate and turn towards the right as the transition process is well underway
- Rain pattern gets eroded from the trailing half of the storm and wind pattern continues to expand – strongest winds on the right hand side of the track



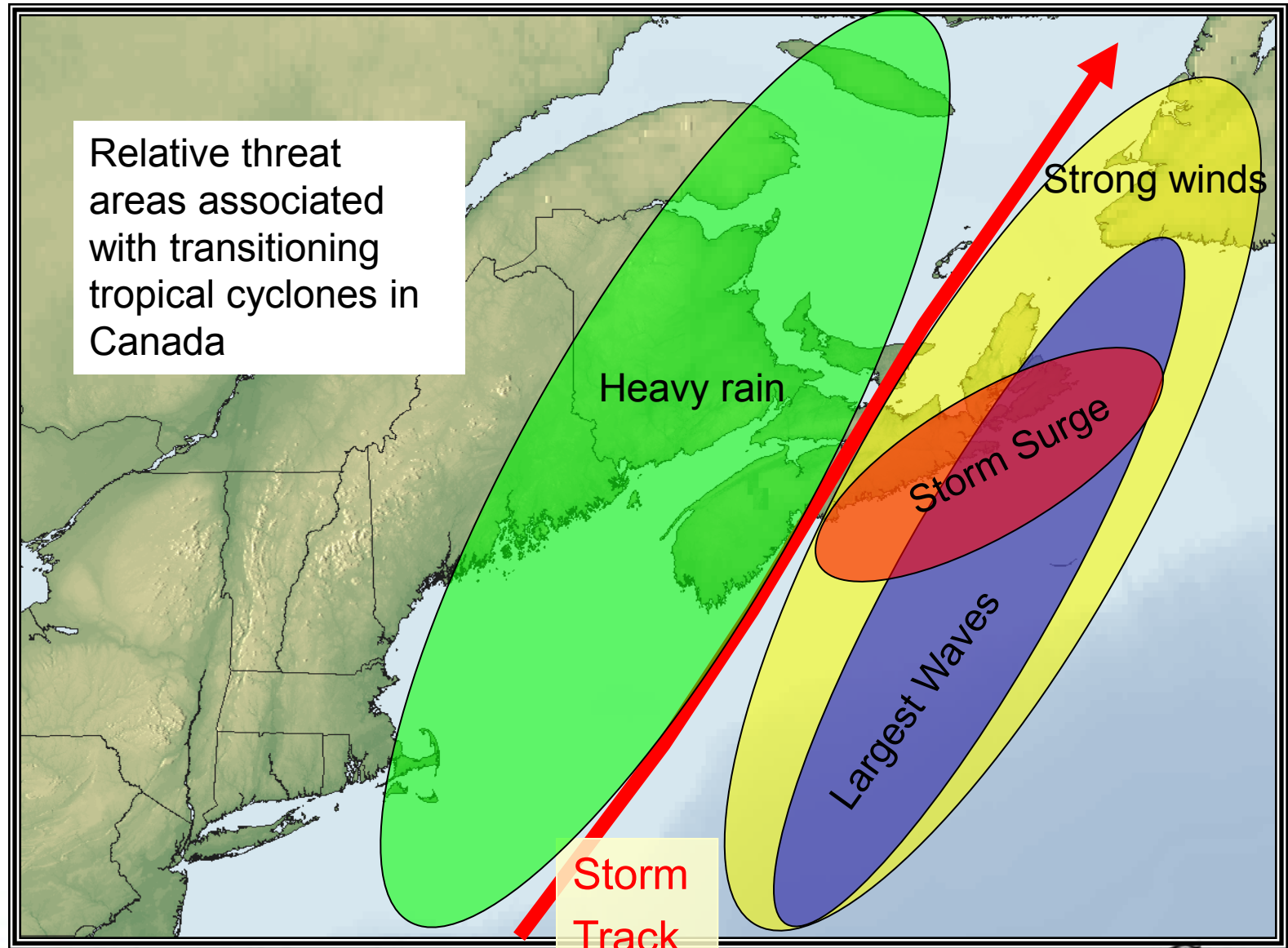
Tropical Cyclone Stages- Post Tropical

Day 17

- Post-Tropical Storm continues to accelerate and turn towards the right
- Heaviest rain now shifted on the left of the track
- Wind pattern continues to expand – strongest winds on the right hand side of the track

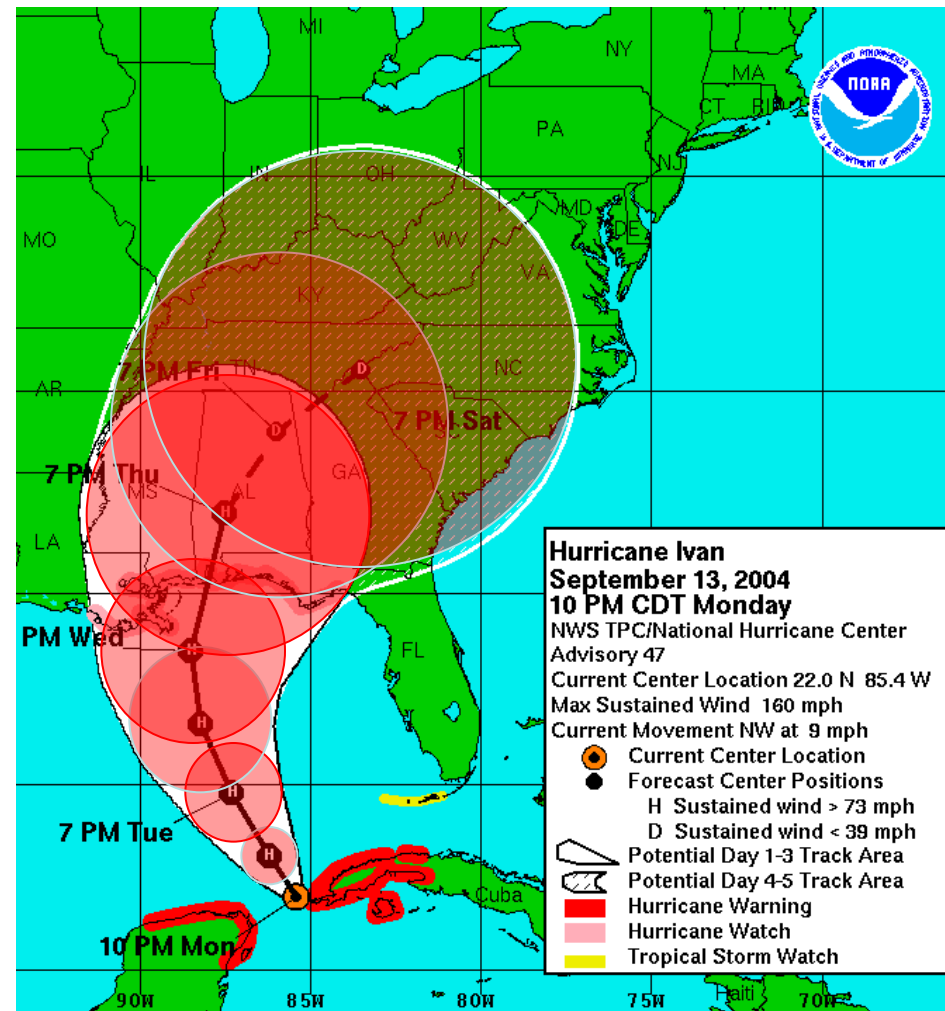


Typical Threat Areas



Common Misconception – Track Forecast

- Represents the probable track of the *center* of the tropical cyclone.
- Formed by connecting circles centered on each forecast point (at 12, 24, 36 h, etc.)
- Size of the circles determined so that, say, the actual storm position at 48 h will be within the 48-h circle 67% of the time.

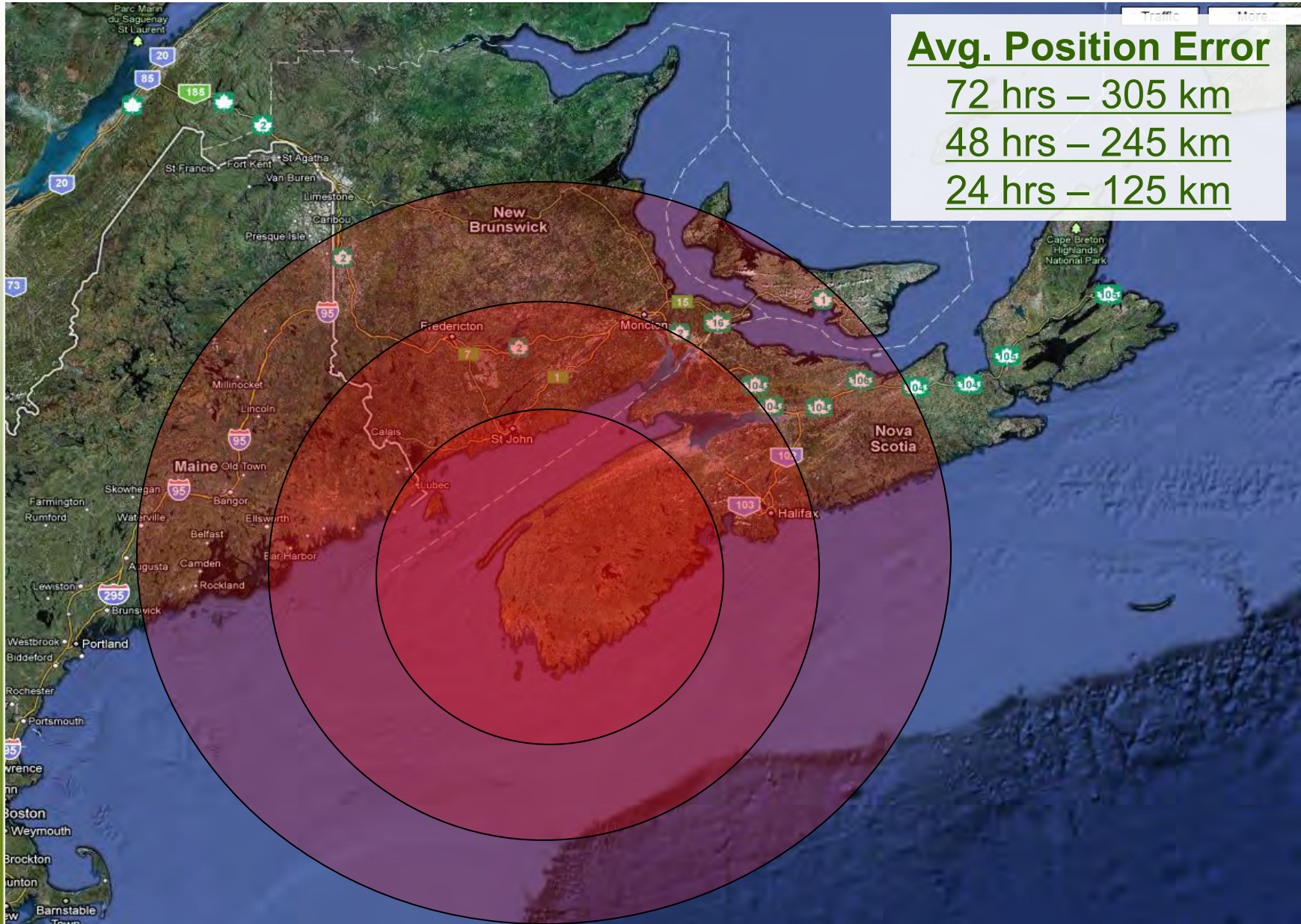


Impacts can Occur Well Outside the Cone

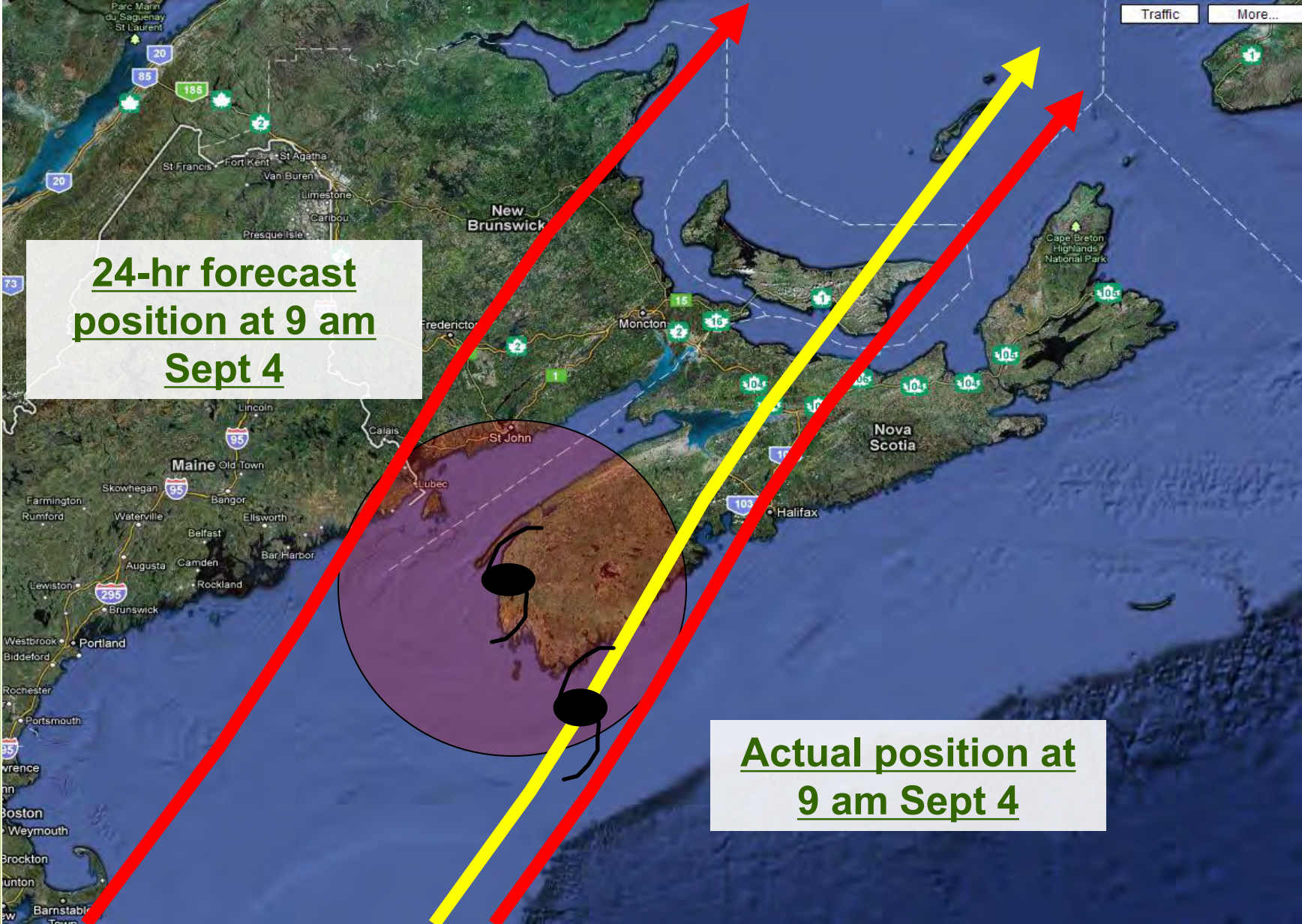


Hurricane Position Forecast Errors

Avg. Position Error
72 hrs – 305 km
48 hrs – 245 km
24 hrs – 125 km



Example: Hurricane Earl



Landmark TC events in Canada

- **“Saxby Gale”** of **Oct 1869**
(Bay of Fundy surge flood)
- **“Great Nova Scotia Cyclone”**
of **Aug 1873** (Extratropical Transition (ET) re-intensification)
- **“Galveston Hurricane”** of **Sept 1900** – ET windstorm over SE’ern Canada with high winds (similar to Ike (2008) overland windstorm in Ohio Valley)



Landmark TC events in Canada

- **“Great August Gale”** of **1927** (Nova Scotia) – similar to 1900 event – extreme right-of-track ET winds
- **Hazel Oct 1954** (severe inland flooding / ET event)
- **Edna Sept 1954** – Nova Scotia – widespread forest blow-down



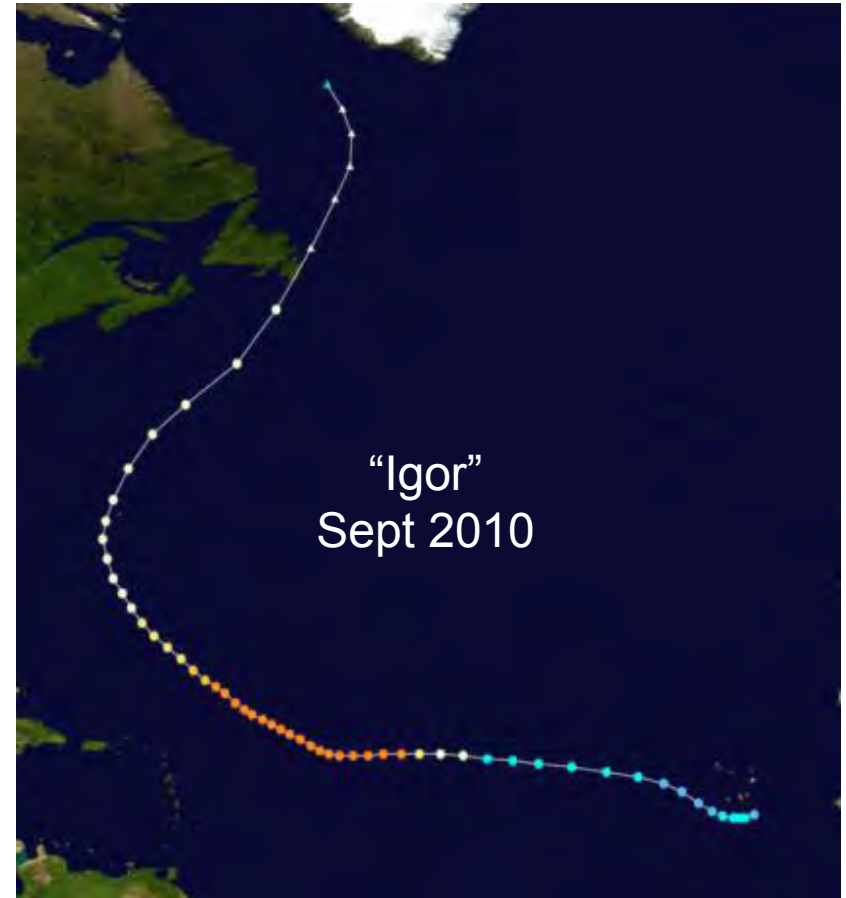
Landmark TC events in Canada

- **“Escuminac Disaster”**
June 1959 – ET re-intensification/trough interaction
- **Beth Aug 1971** – Heavy flooding left-of-track – NS/Halifax
- **Juan Sept 2003** – Nova Scotia cat-2 landfall, pre-ET, massive forest blow-down



Landmark TC events in Canada

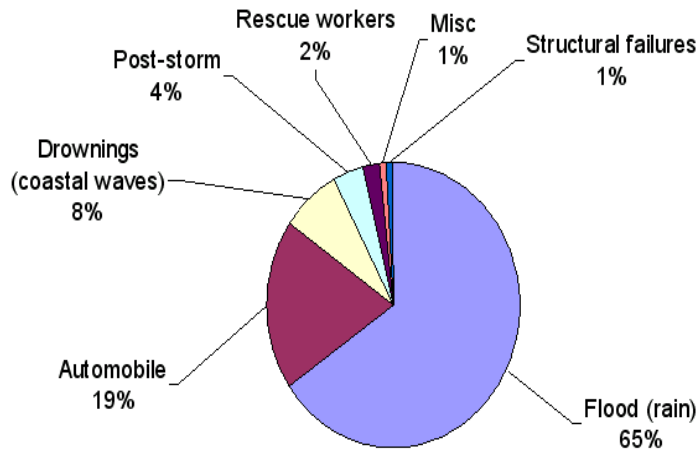
- **Igor Sept 2010** –
Newfoundland strong cat-1,
ET re-intensification, severe
rainfall – numerous
road/bridge washouts



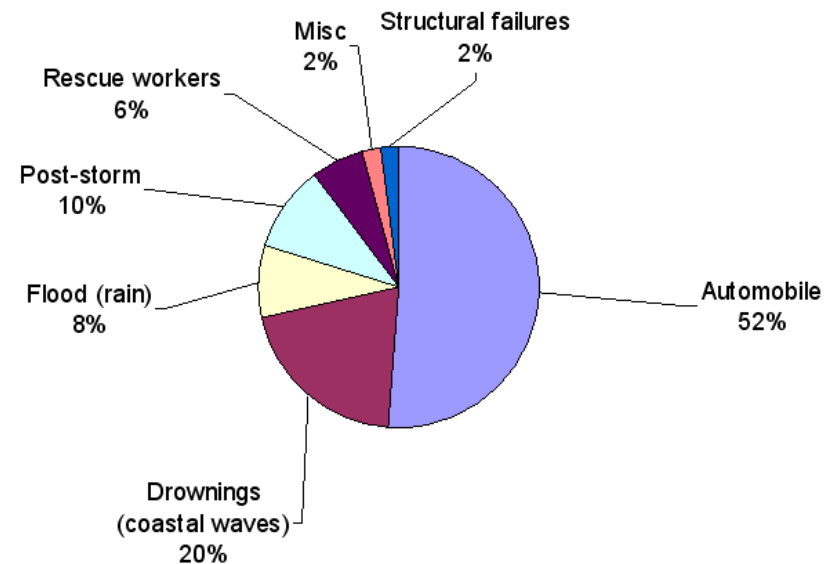
Tropical Cyclone Fatalities in Canada

•1954 “Hazel” caused 81 deaths most of which were due to drowning

Inland Tropical Cyclone Fatalities since 1950 by Percentage of Type



Inland Tropical Cyclone Fatalities since 1950 (without Hazel) by Percentage of Type



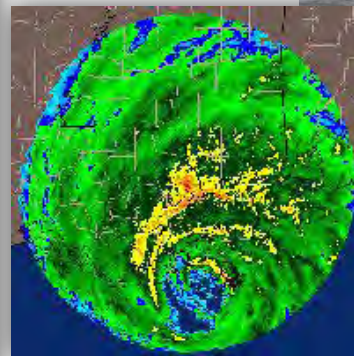
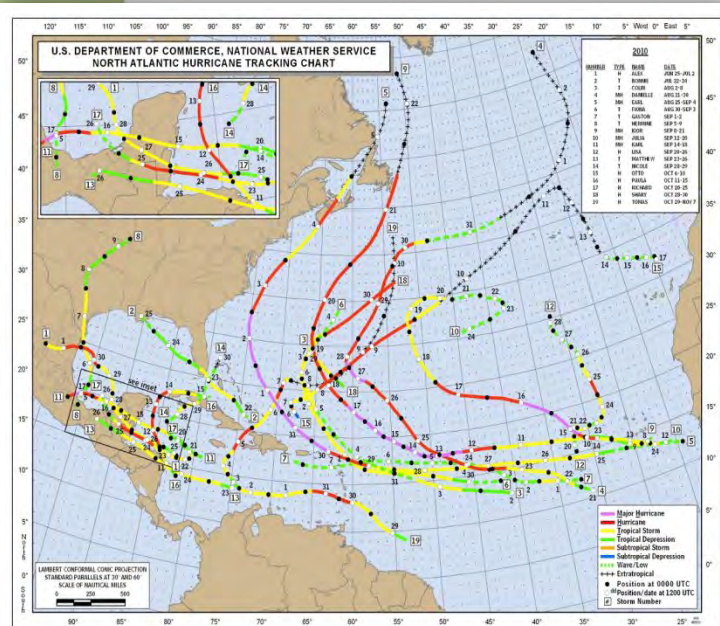
Hurricane Season 2010 in Review

Summary:

19 Named Storms

12 Hurricanes

5 Major hurricanes

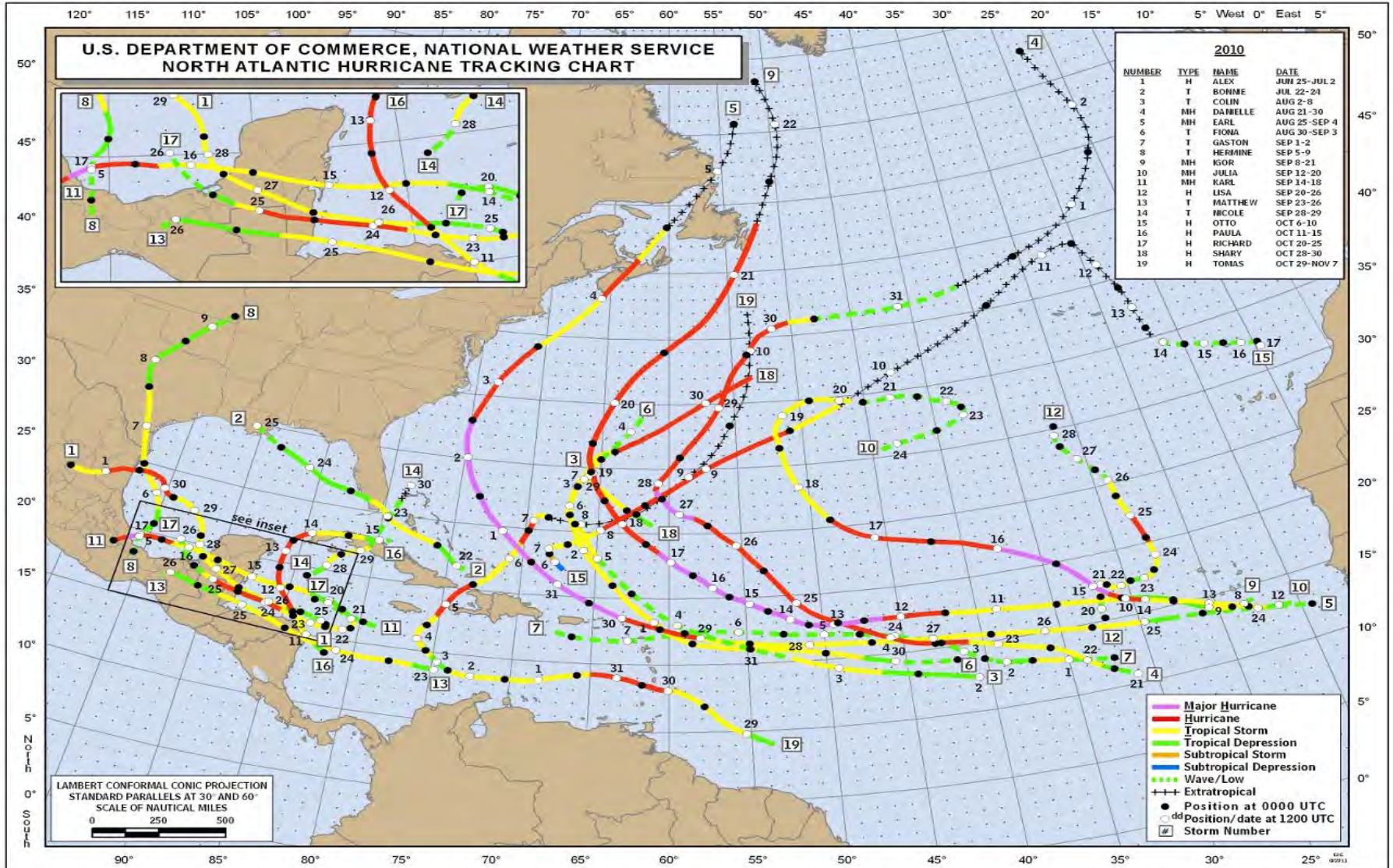


2010 Season in Review

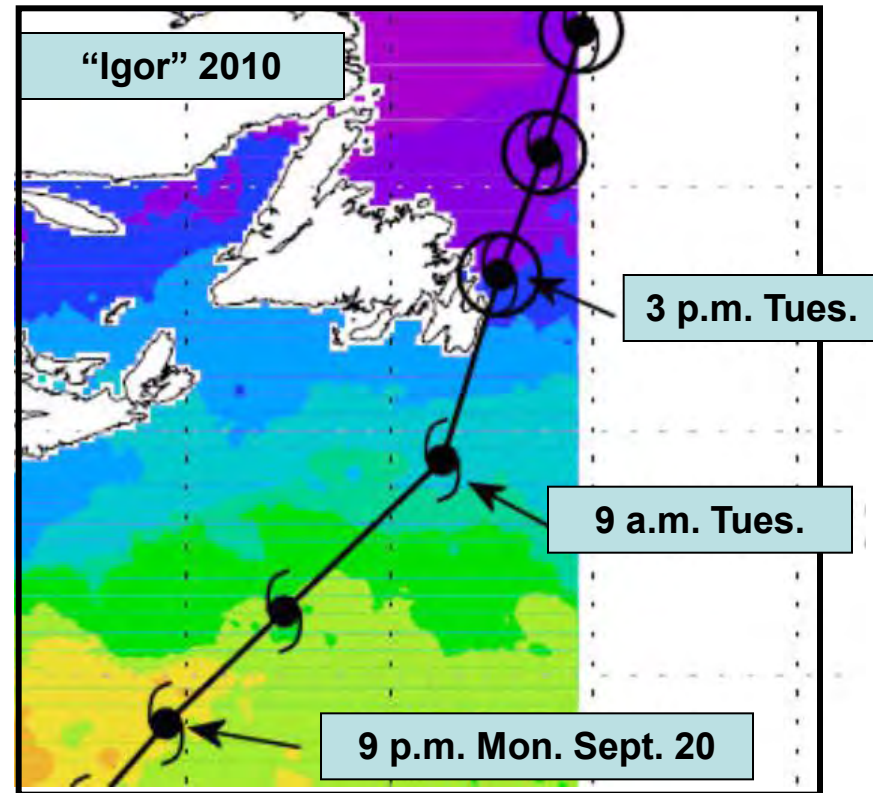
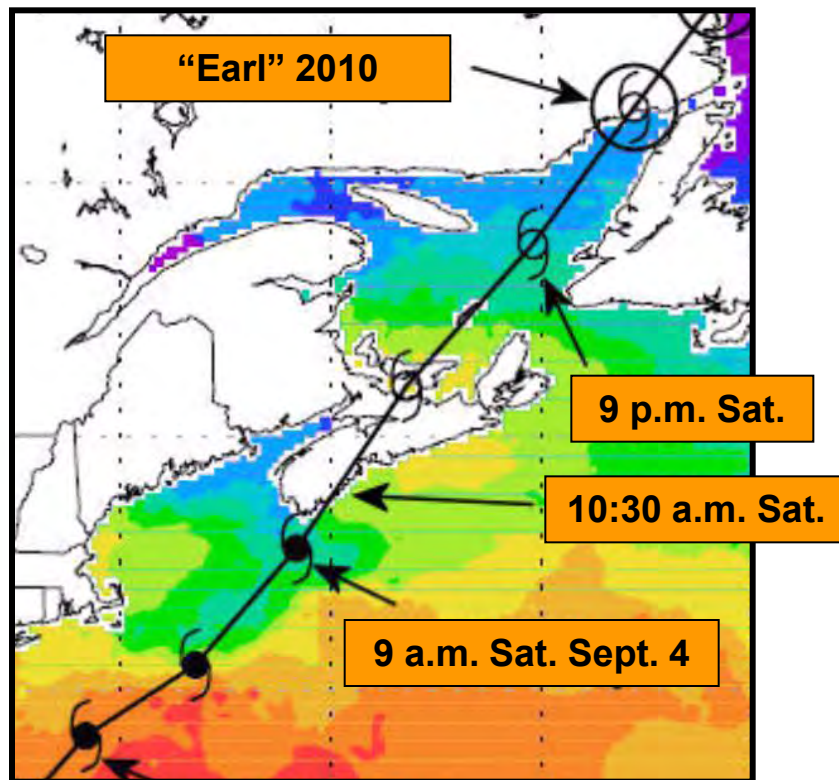
2010 Forecast	Named Storms (Avg. 9.6)	Hurricanes (Avg. 5.9)	Cat. 3-5 Hurricanes (Avg. 2.3)
<i>National Oceanographic and Atmospheric Administration (NOAA)</i>	14-23	8-14	3-7
Actual	19	12	5

- CHC issued bulletins on 4 storms
- 3 storms entered CHC response zone
- 2 landfalling hurricanes in Canada

2010 Season in Review



2010 Season in Review



2010 Season in Review

Hurricane Earl	Hurricane Igor
September 4, 2010	September 21, 2010
one of the largest and most clearly-defined hurricanes N.S. forecasters have seen in this region	the most damaging tropical cyclone to strike N.L. in modern era
landfall as Category 1 hurricane causing high winds, significant waves, storm surges	landfall as Category 1 hurricane causing widespread damage and destruction near \$200 million
	name has since been retired

Other interesting facts about the 2010 Season

- One of the most active seasons on record
- First time since 1924 that Canada has had 2 landfalling hurricanes
- First time in a season with 10 or more named storms that the U.S. has not had a landfalling hurricane
- Fifth year in a row with no landfalling major hurricane in U.S.

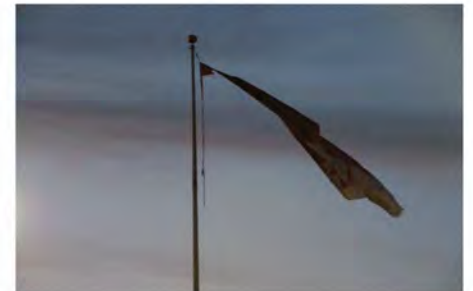
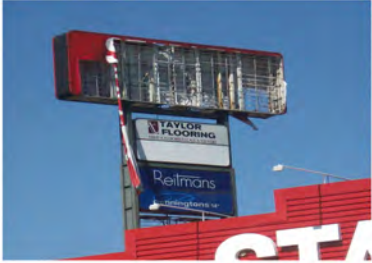
2010 Season in Review

- 2010 Hurricane Season in 4 minutes



<http://www.nnvl.noaa.gov/MediaDetail.php?MediaID=595&MediaTypeID=2>

2010 Season in Review – Hurricane Earl



Hurricane Igor Summary



Affected communities

As reported to the Department of Municipal Affairs

- Adams Cove
- Adeytown (LSD)
- Baine Harbour
- Bay de Verde
- Bay L'argent
- Beau Bois (LSD)
- Boat Harbour
- Bonavista
- Brownsdale (LSD)
- Bunyan's Cove (LSD)
- Burin
- Canning's Cove (LSD)
- Carbonear
- Cavendish/Trinity Bay (LSD)
- Chance Cove
- Chapel Arm
- Clareville
- Clarke's Beach
- Come By Chance
- Dover
- Elliston
- English Harbour East
- Epworth-Great Salmonier (LSD)
- Fortune
- Fox Cove/Mortier
- Fox Harbour
- Freshwater
- Gambo
- Gander
- Garden Cove
- Glovertown
- Goobies (LSD)
- Grand Bank
- Grand Le Pierre
- Harbour Grace
- Harbour Mille - Little Harbour (LSD)
- Hare Bay
- Heart's Content
- Heart's Delight
- Hickman's Harbour (LSD)
- Hodge's Cove (LSD)
- Holyrood
- Kings Cove
- Lamaline
- Lawn
- Lewin's Cove
- Lewisporte
- Little Catalina
- Little St. Lawrence (LSD)
- Logy Bay
- Long Harbour
- Marystown
- Mount Pearl
- Musgravetown
- New Perlican
- New Wes Valley
- Norman's Cove
- Old Perlican
- Parker's Cove
- Placentia
- Point au Gaul
- Point May
- Port Blandford
- Port Rexton
- Random Island West
- Red Harbour
- Rushoon
- Salmon Cove
- Sandringham
- South East Bight
- South River
- Southern Harbour
- Southwest Arm (LSD)
- St Vincent's
- St. Bernards/Jacq. Font.
- St. John's
- St. Lawrence
- Summerville (LSD)
- Sunnyside
- Swift Current (LSD)
- Terra Nova
- Terrenceville
- Torbay
- Trinity Bay North
- Victoria
- Wabana
- Whiteway



Environment
Canada

Environnement
Canada

Canada

2010 Season in Review – Hurricane Igor



Environment Canada
Environnement Canada

Canada 

2010 Season in Review – Hurricane Igor



Environment Canada
Environnement Canada

Canada 

2010 Season in Review – Hurricane Igor



Environment Canada
Environnement Canada

Canada 

Repercussions from the 2010 Season

CBCnews | Canada

IN THE NEWS
 ■ Canada Votes ■ Vote Compass
 ■ Royal Wedding ■ Electricity in Canada

Home World **Canada** Politics Business Health Arts & Entertainment Technology & Science Community Weather Video

Canada NB Photo Galleries

N.B. homeowner insurance could spike: advocate

CBC News Posted: Apr 4, 2011 10:02 PM AT | Last Updated: Apr 4, 2011 10:19 PM AT

Big hikes in homeowner premiums could be on the way, especially for those with bad credit, New Brunswick's insurance watchdog warned Monday.



Ronald Godin, New Brunswick's Consumer Advocate for Insurance, warned homeowner's insurance could spike.

Ronald Godin, the Consumer Advocate for Insurance, said a "perfect storm" might be coming where home insurance prices could spike up, like auto insurance did 10 years ago.

New Brunswick is the only province with a Consumer Advocate for Insurance, and in the six years Godin has been working for the legislature, car insurance rates have dropped and stayed stable.

But complaints about home insurance are going up fast, he said.

For one thing, damage from climate events like New Brunswick's winter rains has taken over from fire damage as the No. 1 source of insurance claims, Godin said.



Many homes in New Brunswick were flooded during heavy rains in December. (CBC)

Last year, Co-Op Atlantic told its insurance clients in Gloucester County they had to re-qualify for coverage after a check of their credit scores.

For those with bad credit, he said, the cost of insurance coverage went up by 100 per cent or more.

The former Liberal government changed the law last year to ban that practice, but there still are no written regulations to put the ban in place.

"It sounds almost like moral judgment. You know, if I pay you on time and I haven't submitted a claim, what is your problem that I'm a little late on my Visa payments?" Godin said.

He said it's a kind of discrimination to single out people with bad credit as

CTV NEWS Shows

Canada - Tuesday June 14, 2011

News Sections

Top Stories

Canada

- Atlantic
- British Columbia
- Calgary
- Edmonton
- Montreal
- Northern Ontario
- Ottawa
- Regina
- Saskatoon
- Southwestern Ontario
- Toronto
- Winnipeg

- World
- Entertainment
- Sports
- Business
- Sci-Tech
- Health
- Politics
- Weather

News Programs

- CTV National News with Lloyd Robertson
- Canada AM
- W5

Home - Canada - N.B. home insurance rates could become major issue

N.B. home insurance rates could become major issue



A A | Email | Print f Share T Tweet

Share Recommend Sign Up to see what your friends recommend.

The Canadian Press
 Date: Monday Apr. 4, 2011 8:45 AM ET

FREDERICTON — New Brunswick's consumer advocate for insurance is warning that rising home insurance premiums could become as big an issue as the dramatic rise in car insurance rates a few years ago.

In his annual report, Ronald Godin says with a recent increase in weather-related claims there is a potential for a perfect storm in house insurance.

He says the issue is very real and should not be dismissed lightly.

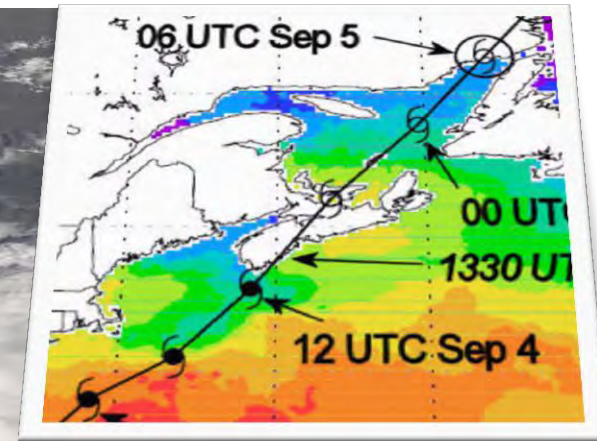
Floods and storm surges caused millions of dollars in damage in the province in 2010.

Meanwhile, the overall rate for automobile insurance decreased slightly last year, with an average annual premium of \$742.

After all these storms a regional newspaper in the Maritimes had a survey asking people if they were prepared for a hurricane or other natural disaster:

10%	Yes
82%	No
8%	Don't know

2011 Seasonal Hurricane Forecast



Amherst Daily News
AMHERST, N.S. WWW.AMHERSTDAILY.COM

Friday, August 21, 2009

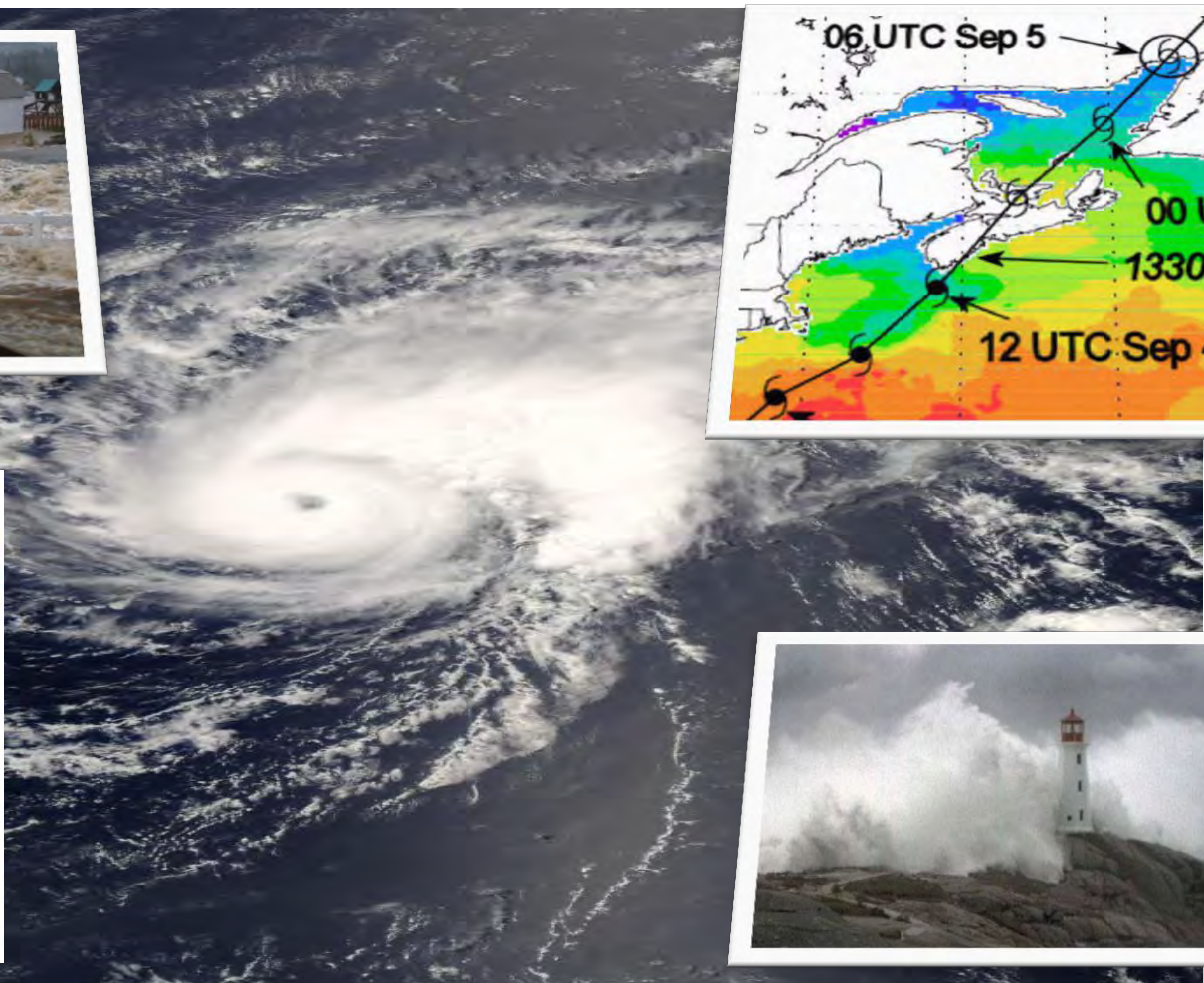
Hit or miss?
Either way, experts are warning Maritimers to be ready as Hurricane Bill heads this way for possible Sunday strike — see S10 (A1), Page 2 & 3

YOU SAID IT
"Coming digital means we can finally get on to the rest of the world. Sadly not many people know we exist!"
— Mike McLean of the New Scotia HighSchool Program/Member — Page 7

SYNOPSIS
High election day view
Several in rural/urban areas...
QUICK WEATHER

TEMP	HUMIDITY
Current: 18	Relative: 75%
High: 29	High: 27
Low: 18	Low: 21

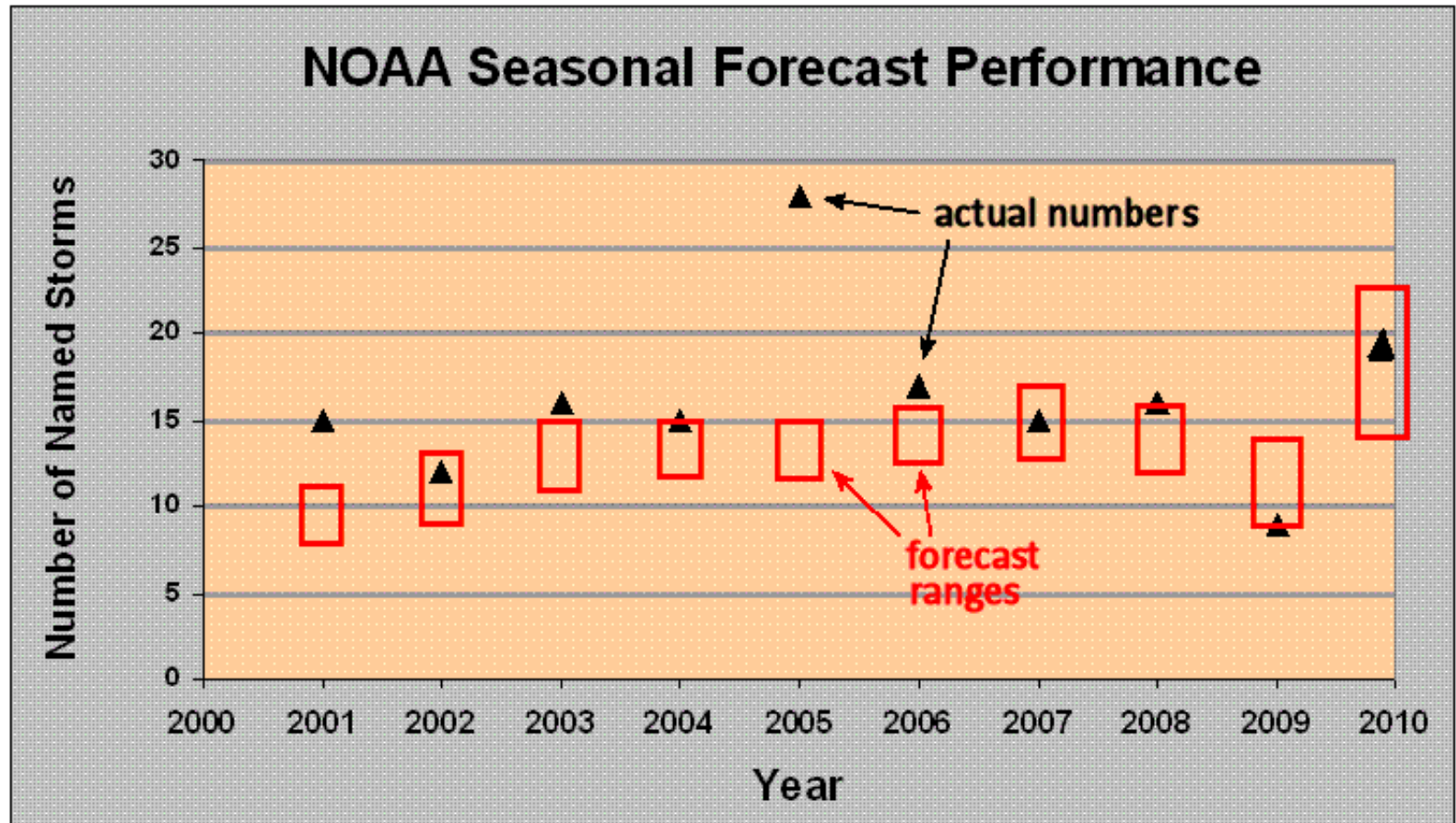
See detailed weather on Page 3
For more news, visit www.amherstdaily.com



Spring 2011 Atlantic Hurricane Forecast

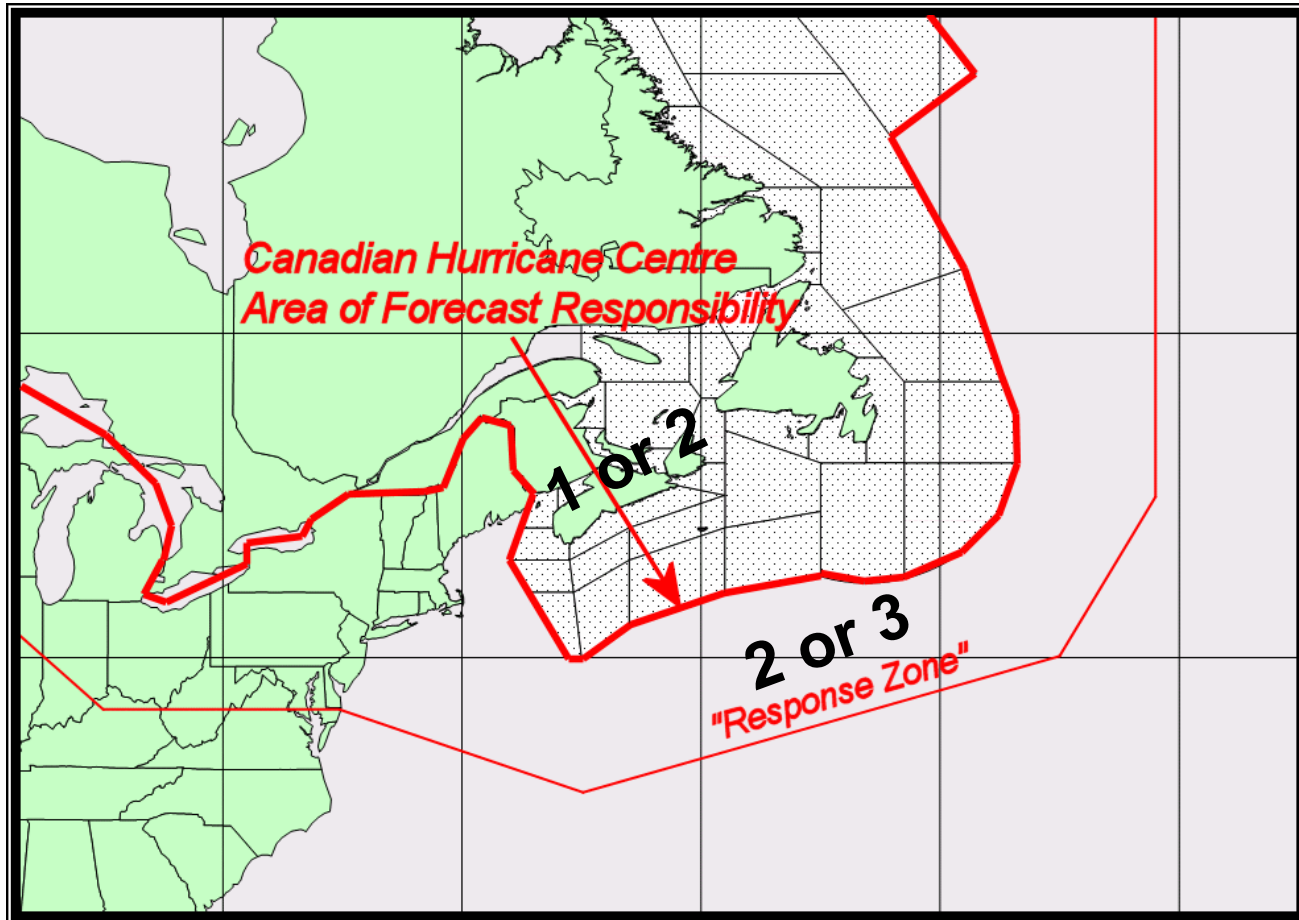
	Named Storms	Hurricanes Category 1 to 5	Major Hurricanes Category 3-5
National Oceanic and Atmospheric Administration (US)	12-18	6-10	3-6
2000-2010 Average	15 or 16	8	4
1961-2010 Average	11	6	2 or 3

NOAA Seasonal Forecast



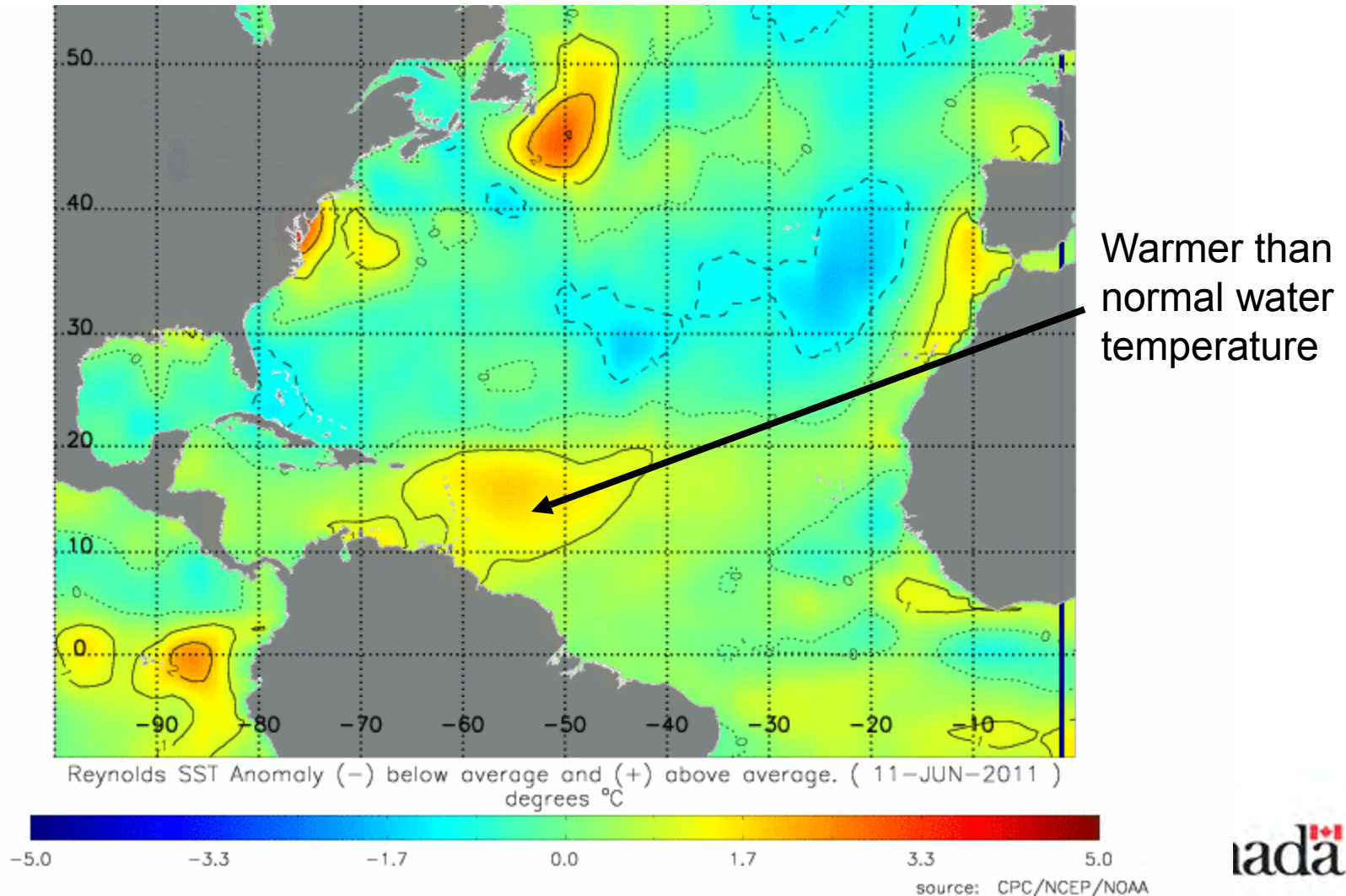
CHC Response Zone

On average, 1 or 2 storms directly affect Canadian land regions each year. Another 2 or 3 typically threaten our offshore waters.



Latest Water Temperature Patterns

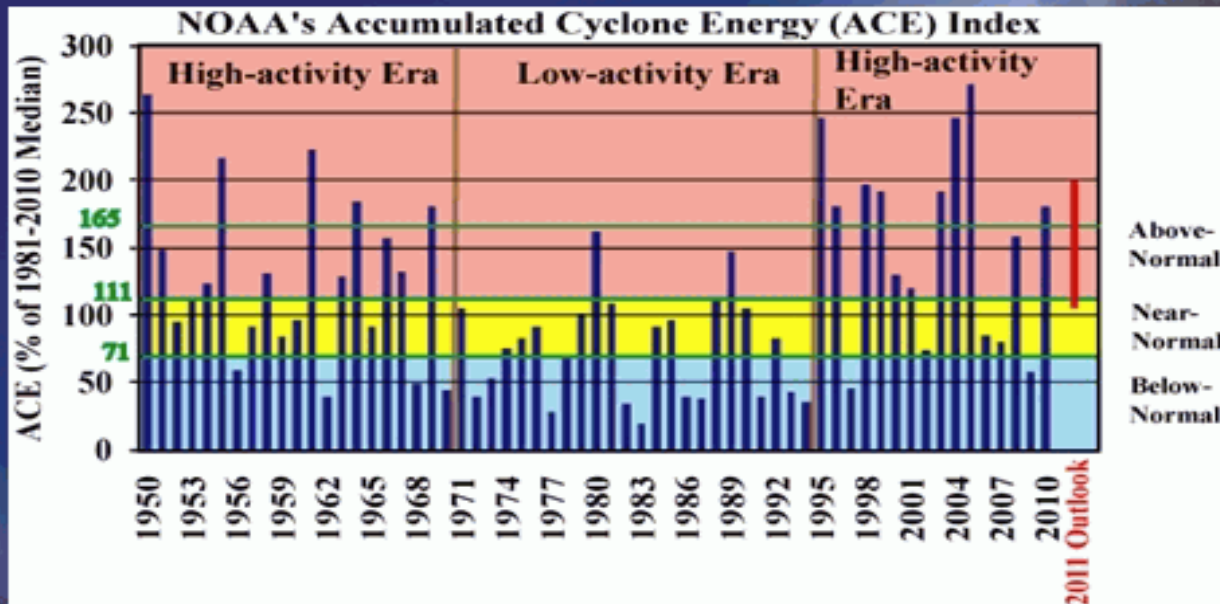
If this pattern persists into the summer, there will be an increased chance of storm development.



We are in an active cycle right now



The 2011 Atlantic Outlook in a Historical Perspective



NOAA's 2011 Atlantic hurricane season outlook indicates a 70% probability of an ACE range of 105%-200% of the median.

An ACE value above 165% of median reflects an extremely active (also called hyperactive) season.



Tropical Cyclone Names

2011	2012	2013	2014	2015	2016
Arlene	Alberto	Andrea	Arthur	Ana	Alex
Bret	Beryl	Barry	Bertha	Bill	Bonnie
Cindy	Chris	Chantal	Cristobal	Claudette	Colin
Don	Debby	Dorian	Dolly	Danny	Danielle
Emily	Ernesto	Erin	Edouard	Erika	Earl
Franklin	Florence	Fernand	Fay	Fred	Fiona
Gert	Gordon	Gabrielle	Gonzalo	Grace	Gaston
Harvey	Helene	Humberto	Hanna	Henri	Hermine
Irene	Isaac	Ingrid	Isaias	Ida	Ian **
Jose	Joyce	Jerry	Josephine	Joaquin	Julia
Katia	Kirk	Karen	Kyle	Kate	Karl
Lee	Leslie	Lorenzo	Laura	Larry	Lisa
Maria	Michael	Melissa	Marco	Mindy	Matthew
Nate	Nadine	Nestor	Nana	Nicholas	Nicole
Ophelia	Oscar	Olga	Omar	Odette	Otto
Philippe	Patty	Pablo	Paulette	Peter	Paula
Rina	Rafael	Rebekah	Rene	Rose	Richard
Sean	Sandy	Sebastien	Sally	Sam	Shary
Tammy	Tony	Tanya	Teddy	Teresa	Tobias **
Vince	Valarie	Van	Vicky	Victor	Virginie
Whitney	William	Wendy	Wilfred	Wanda	Walter

** From 2010, **Igor and Tomas** were retired from the list of names – only the second time that Canada has requested a storm name be retired



Changes to Canadian Hurricane Centre Forecast Products

general bulletin
(all users)



WOCN31 CUHX 201200
TROPICAL CYCLONE INFORMATION STATEMENT ISSUED BY THE CANADIAN HURRICANE CENTRE OF ENVIRONMENT CANADA AT 9.00 AM ADT MONDAY 20 SEPTEMBER 2010.

INFORMATION STATEMENT FOR:
=NEW= NEWFOUNDLAND.

HURRICANE IGOR.

THE NEXT STATEMENT WILL BE ISSUED BY 3.00 PM ADT

IGOR NORTH OF BERMUDA, EXPECTED TO CROSS THE GRAND BANKS AND GIVE HEAVY RAIN AND GUSTY WINDS TO NEWFOUNDLAND ON TUESDAY.

=DISCUSSION=
1. SUMMARY OF BASIC INFORMATION AT 9.00 AM ADT

LOCATION: 35.2 N 64.0 W
ABOUT 320 KM NORTH NORTHEAST OF BERMUDA
MAXIMUM SUSTAINED WINDS: 120 KM/H
PRESENT MOVEMENT: NORTH NORTHEAST AT 33 KM/H
MINIMUM CENTRAL PRESSURE: 957 MB.

2. PUBLIC WEATHER IMPACTS AND WARNINGS SUMMARY

WHILE THE CENTRE OF IGOR IS EXPECTED TO PASS WELL SOUTHEAST OF THE AVALON PENINSULA LATER ON TUESDAY, IT IS EXPECTED TO SPREAD HEAVY RAIN ACROSS CENTRAL AND EASTERN PORTIONS OF THE PROVINCE TUESDAY MORNING. IN ADDITION, A TROUGH OF LOW PRESSURE UNRELATED TO IGOR WILL CROSS NEWFOUNDLAND TODAY AND TONIGHT AND SPREAD PERIODS OF RAIN TO THE SOUTH COAST. THE NEWFOUNDLAND AND LABRADOR WEATHER OFFICE (NLWFO) HAS ISSUED RAINFALL WARNINGS TO THIS TROUGH. ON TUESDAY MORNING, TROPICAL MOISTURE FROM THE TROUGH WILL BRING HEAVY RAIN TO THE AVALON PENINSULA AND EASTERN PORTIONS OF THE PROVINCE. TOTAL RAINFALL AMOUNTS ON THE AVALON PENINSULA WILL BE EXTENSIVE EASTERN NEWFOUNDLAND.

A. WIND

WIND GUSTS POSSIBLY EXCEED 100 KM/H PARTS OF THE AVALON PENINSULA AND EVENING. THE CHC HAS EXTENDED THESE AREAS. THERE SHOULD BE PREPARED FOR DAMAGE.

B. RAINFALL

EXCESSIVE RAINFALL WILL BE EXPECTED NEAR AND CLOSE TO THE RIGHT-HAND-SIDE OF IGOR'S TRACK.

PLEASE REFER TO THE PUBLIC AND MARINE FORECASTS AND WARNINGS ISSUED BY ENVIRONMENT CANADA FOR YOUR AREA.

END KHAN/HATT/FOGARTY

FXCN31 CUHX 201200
TROPICAL CYCLONE TECHNICAL INFORMATION STATEMENT ISSUED BY THE CANADIAN HURRICANE CENTRE OF ENVIRONMENT CANADA AT 9.00 AM ADT MONDAY 20 SEPTEMBER 2010.

THE NEXT TECHNICAL STATEMENT WILL BE ISSUED BY 3.00 PM ADT

1. CURRENT POSITION, STRENGTH, CENTRAL PRESSURE AND MOTION

AT 9.00 AM ADT, HURRICANE IGOR WAS LOCATED NEAR LATITUDE 35.2 N AND LONGITUDE 64.0 W, ABOUT 175 NAUTICAL MILES OR 320 KM NORTH NORTHEAST OF BERMUDA. MAXIMUM SUSTAINED WINDS ARE ESTIMATED AT 65 KNOTS (120 KM/H) AND CENTRAL PRESSURE AT 957 MB. IGOR IS MOVING NORTH NORTHEAST AT 18 KNOTS (33 KM/H).

2. FORECAST POSITION, CENTRAL PRESSURE AND STRENGTH

DATE	TIME	LAT	LONG	MSLP	MAX WIND
	ADT			MB	KTS
SEP 20	9.00 AM	35.2N	63.7W	957	65 120
SEP 20	9.00 PM	38.8N	60.1W	955	65 120 TRANSITIONING
SEP 21	9.00 AM	42.5N	55.2W	953	70 130 TRANSITIONING
SEP 21	9.00 PM	46.0N	49.5W	956	70 130 POST-TROPICAL
SEP 22	9.00 AM	48.5N	43.9W	960	65 120 POST-TROPICAL
SEP 22	9.00 PM	51.0N	39.3W	964	60 111 POST-TROPICAL

3. TECHNICAL DISCUSSION

A. ANALYSIS

SATELLITE IMAGERY STILL SHOWS OUTFLOW PATTERN TO THE NORTH AND VAPOUR IMAGERY INDICATES SOME CONVECTION HAS DEVELOPED TO THE WEST OF IGOR. IN ADDITION, CONVECTION HAS DEVELOPED TO THE WEST OF IGOR BECOMING NEARLY ORGANIZED. SHEAR OVER IGOR WILL INCREASE IN INTENSITY IS EXPECTED TO BE SIGNIFICANT OVER THE ISLAND.

← technical bulletin

DEFECT A SIGNIFICANT INTERACTION BETWEEN TRANSITIONING POST-TROPICAL IGOR AND THE SHORT WAVE OVER NEWFOUNDLAND IN THE 24 TO 36 HOUR TIME FRAME. THERE IS LARGE TRACK UNCERTAINTY. IGOR COULD TRACK AS FAR NORTH AS JUST SOUTH OF CAPE RACE TO AS MUCH AS 400 KILOMETRES SOUTH OF CAPE RACE.

IGOR WILL REMAIN OVER VERY WARM SEAS FOR ANOTHER 12 TO 24 HOURS. SHEAR WILL THEN INCREASE AND GRADUAL WEAKENING OF IGOR IS EXPECTED BEFORE THE 36 TO 48 HOUR TIME PERIOD.

CYCLONE PHASE SPACE DEPICTIONS SHOW EXTRATROPICAL TRANSITION BEGINNING TONIGHT, ALTHOUGH MOST OF THE MODELS ARE SUGGESTING THAT THE TRANSITION PROCESS WILL BE SLOW. THE FIRING OF THESE TRANSITION, SPECIFICALLY HOW QUICKLY IGOR'S RAINFALL PATTERN WILL BECOME ASYMMETRICAL AND SHIFT TO LEFT OF TRACK, COULD COME INTO PLAY WITH THE SHORT WAVE INTERACTION OVER NEWFOUNDLAND ON TUESDAY.

C. PREDICTED WIND RADII (MM)

TIME	GALES				STORMS				HURRICANE			
	NE	SE	SW	NW	NE	SE	SW	NW	NE	SE	SW	NW
20/12	300	280	200	240	180	150	120	135	140	80	30	30
22/02	310	250	205	250	180	160	110	145	120	90	50	30
24/02	320	245	215	250	180	150	110	100	100	60	30	30
26/02	335	235	230	250	160	150	110	95	80	60	15	10
28/02	350	230	255	250	145	165	110	85	40	40	0	0
30/02	360	240	295	260	175	175	110	105	0	0	0	0

END KHAN/HATT/FOGARTY



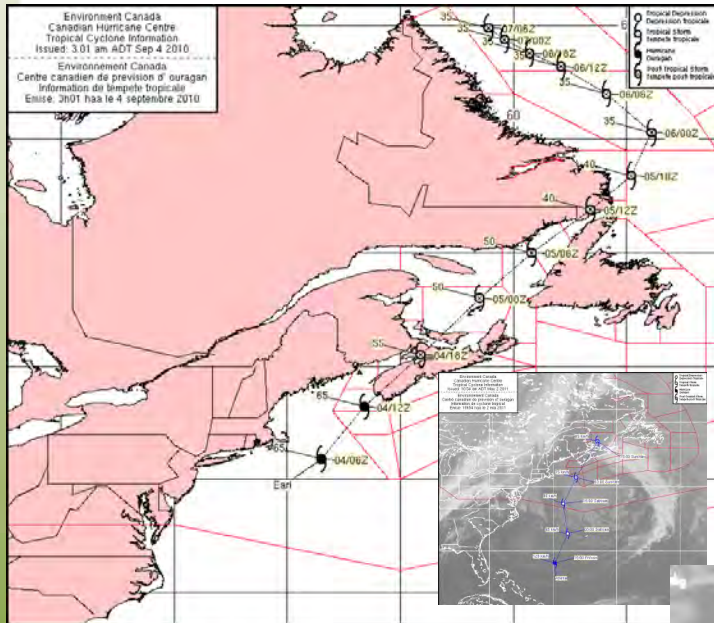
Environment
Canada

Environnement
Canada

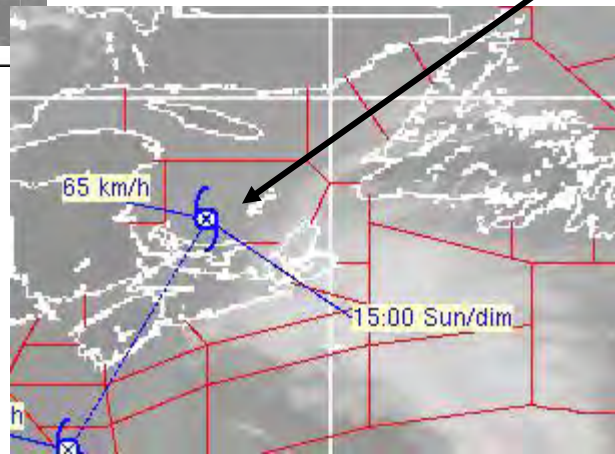
Canada

Changes to Canadian Hurricane Forecast Centre Products

Graphical Products



Forecast Track Map Based on Data contained in the track Information table in the Technical Discussion



....it only takes one storm!
Are you prepared?

