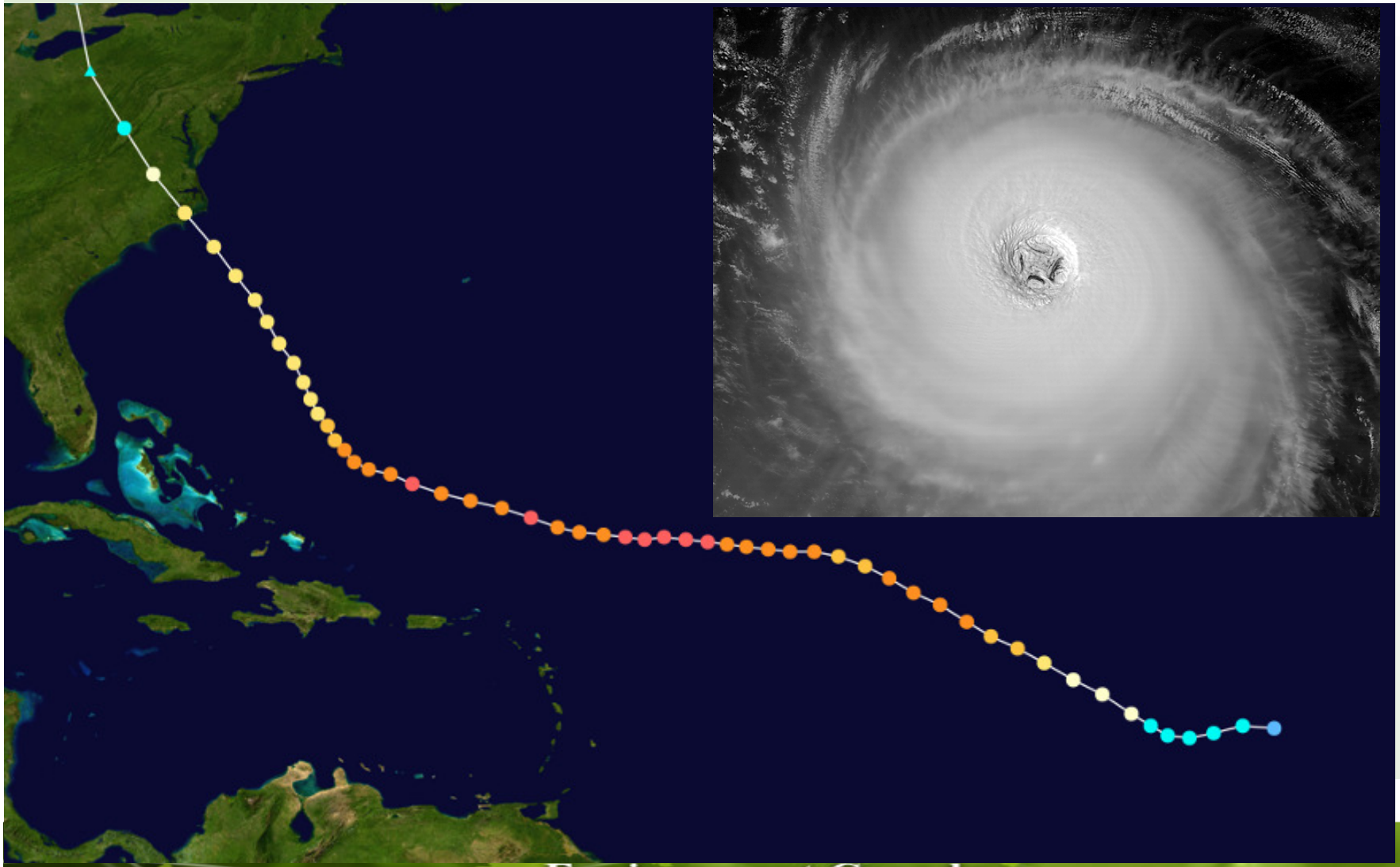
Please don't use the "H" word!

2003 **ISABEL**

Canadian Hurricane Centre



A new Canadian benchmark for awareness

Canadian

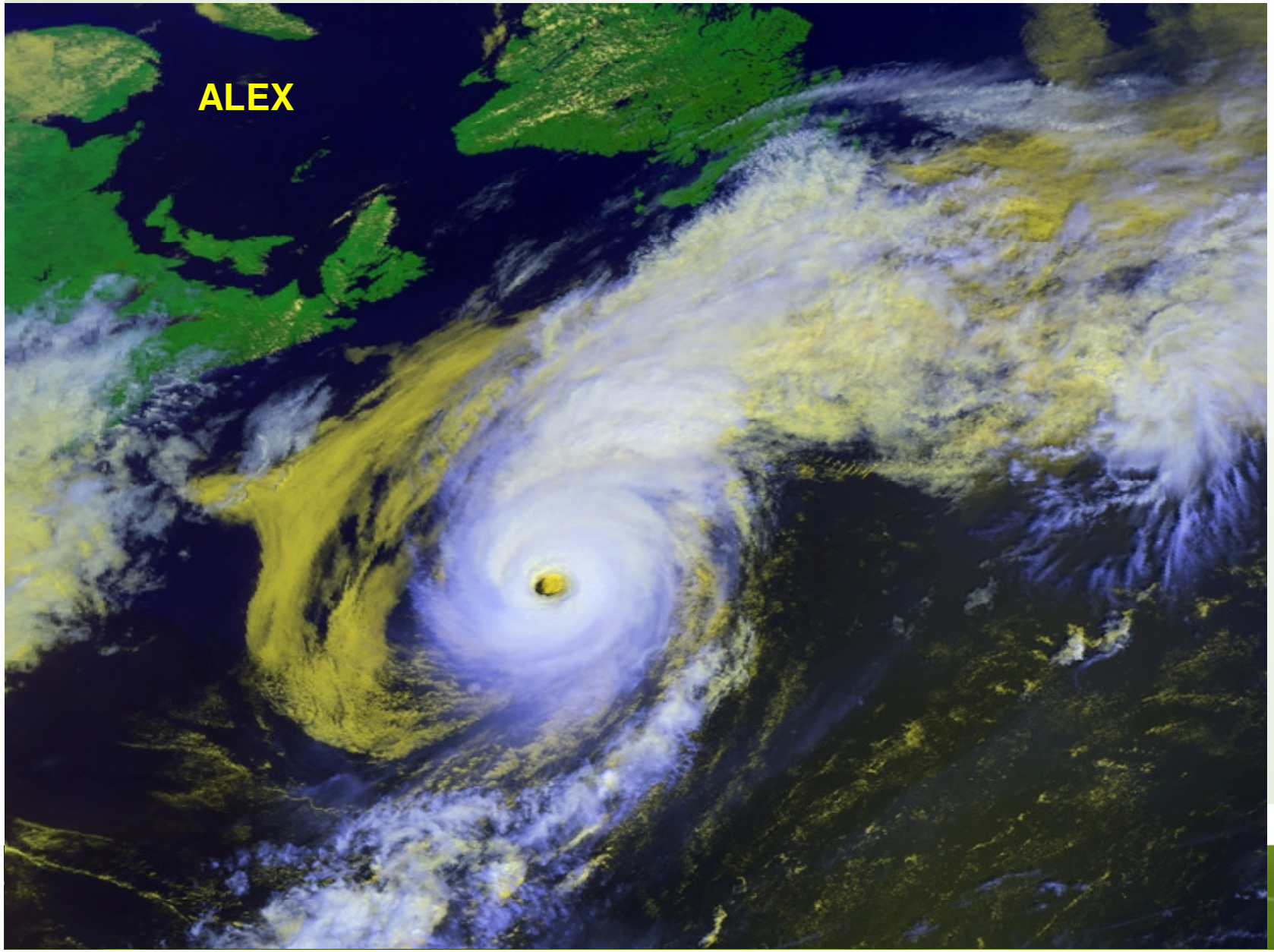
Juan dark and stormy night

2003

Courtesy of Len Wagg

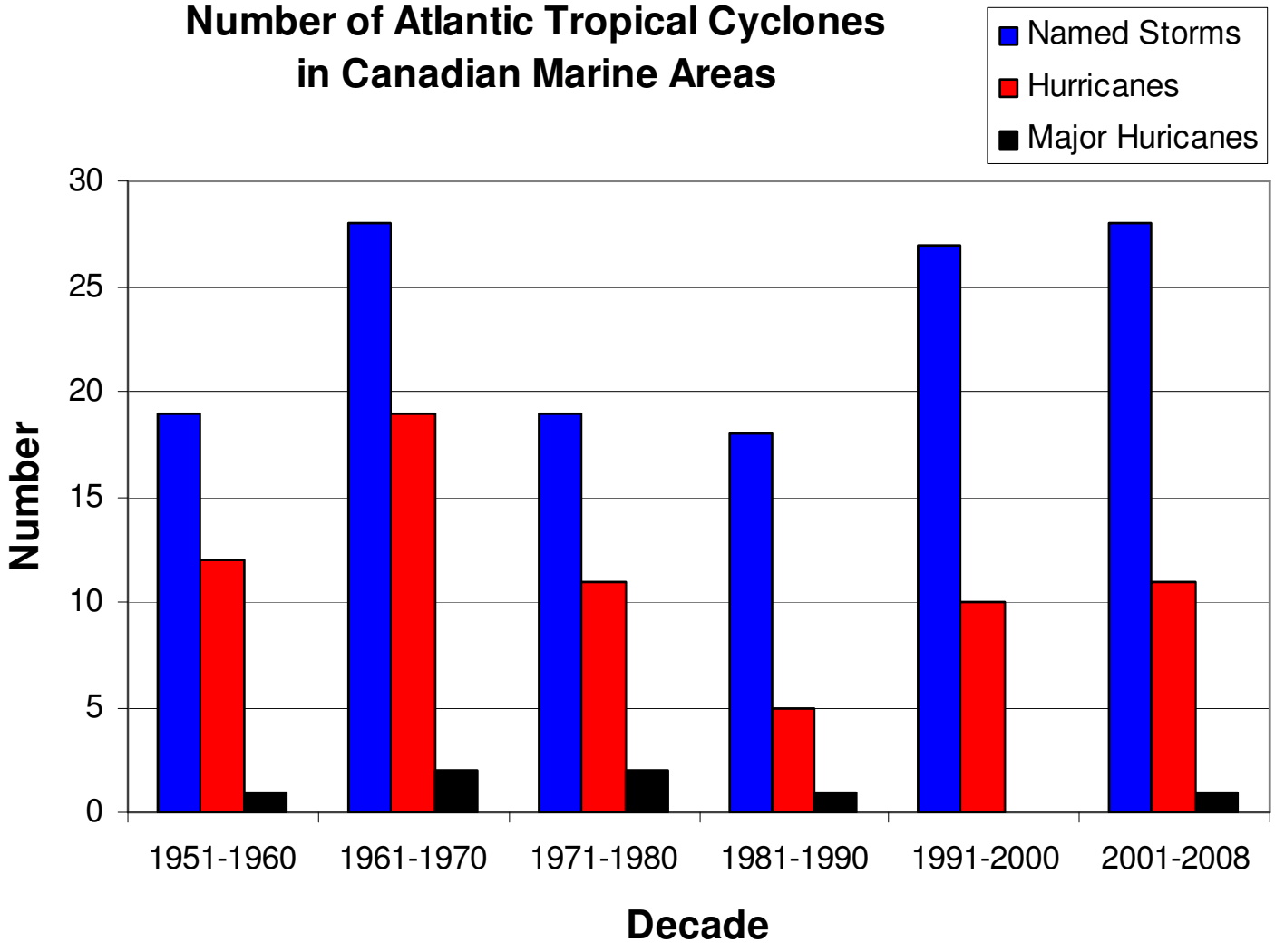
“Harmlessly out at sea”

2004



Canadian Hurricane Centre

"Harmlessly out at sea"



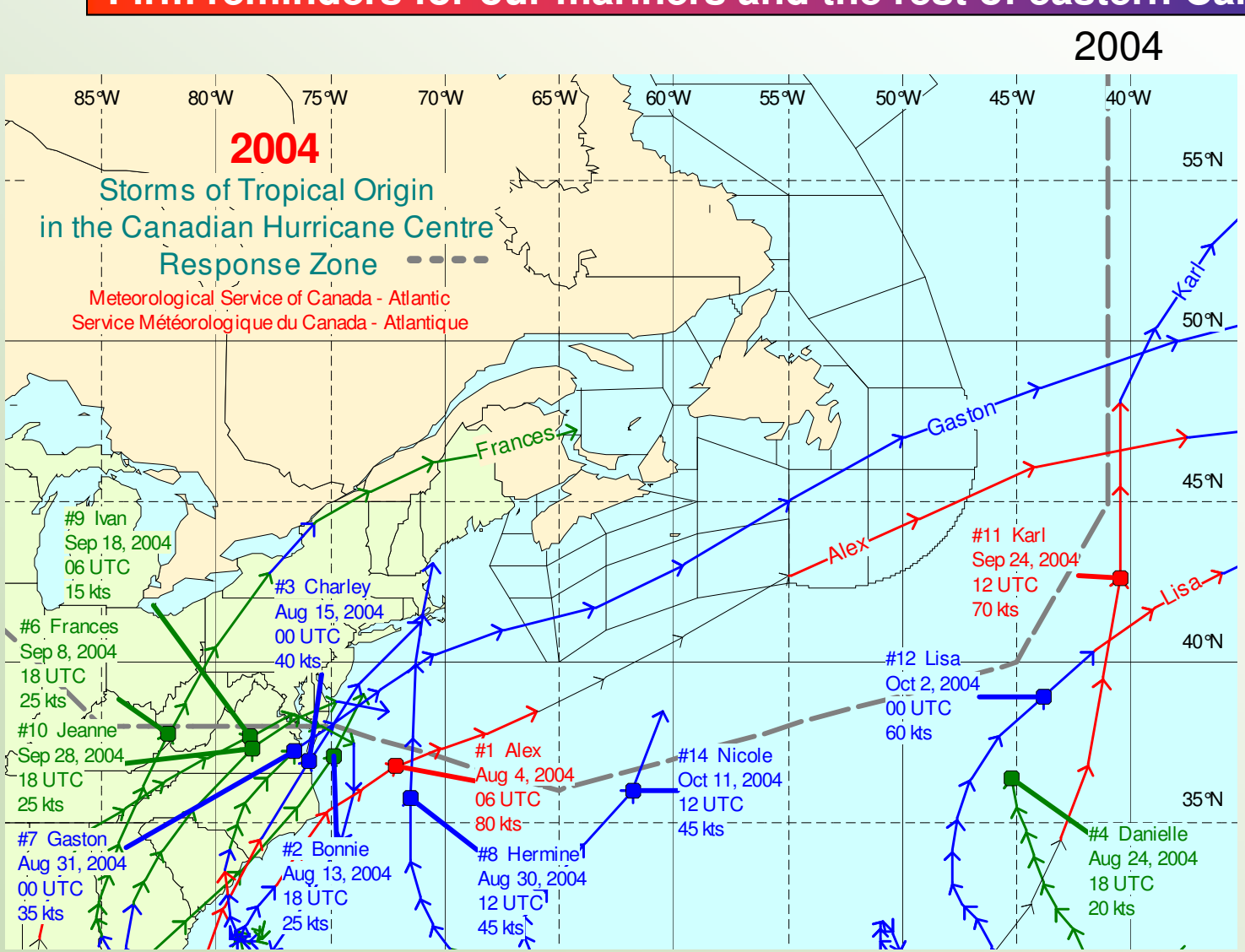
Canadian Hurricane Centre

Only 7 major hurricanes (Cat.3-5) in Canadian waters in last 50 years:

1958 – Daisy
1961 – Frances
1969 – Gerda
1975 – Gladys
1978 – Ella
1982 – Debbie
2004 – Alex

Firm reminders for our mariners and the rest of eastern Canada

Canadian Hurricane Centre



FRANCES

130+ mm in Ottawa & Kingston

Smashed 24-hr rainfall records (fell in 5-6 hrs)

Flooding also in Quebec, New Brunswick & Newfoundland

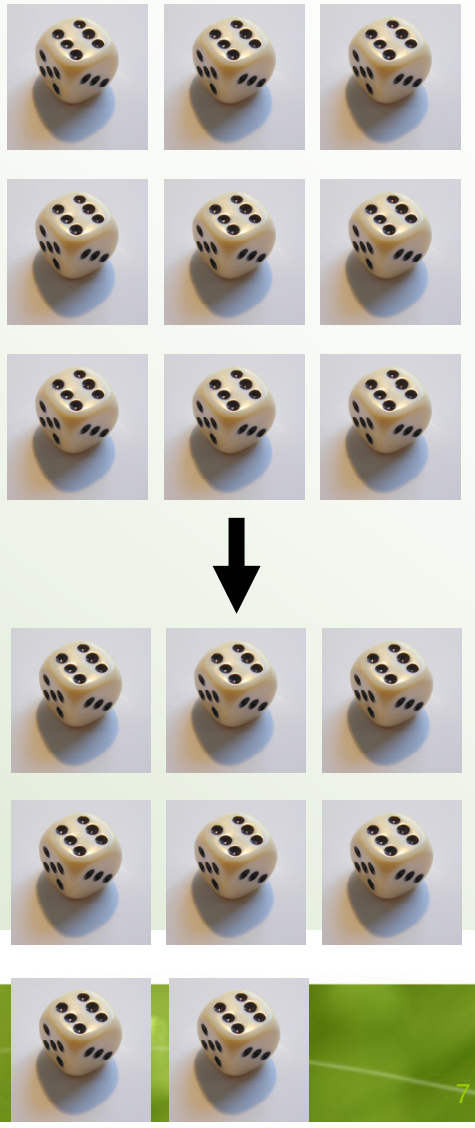
IBC reported claims of $45 million within 3 months

Poster-storm for a debate in crisis

2005

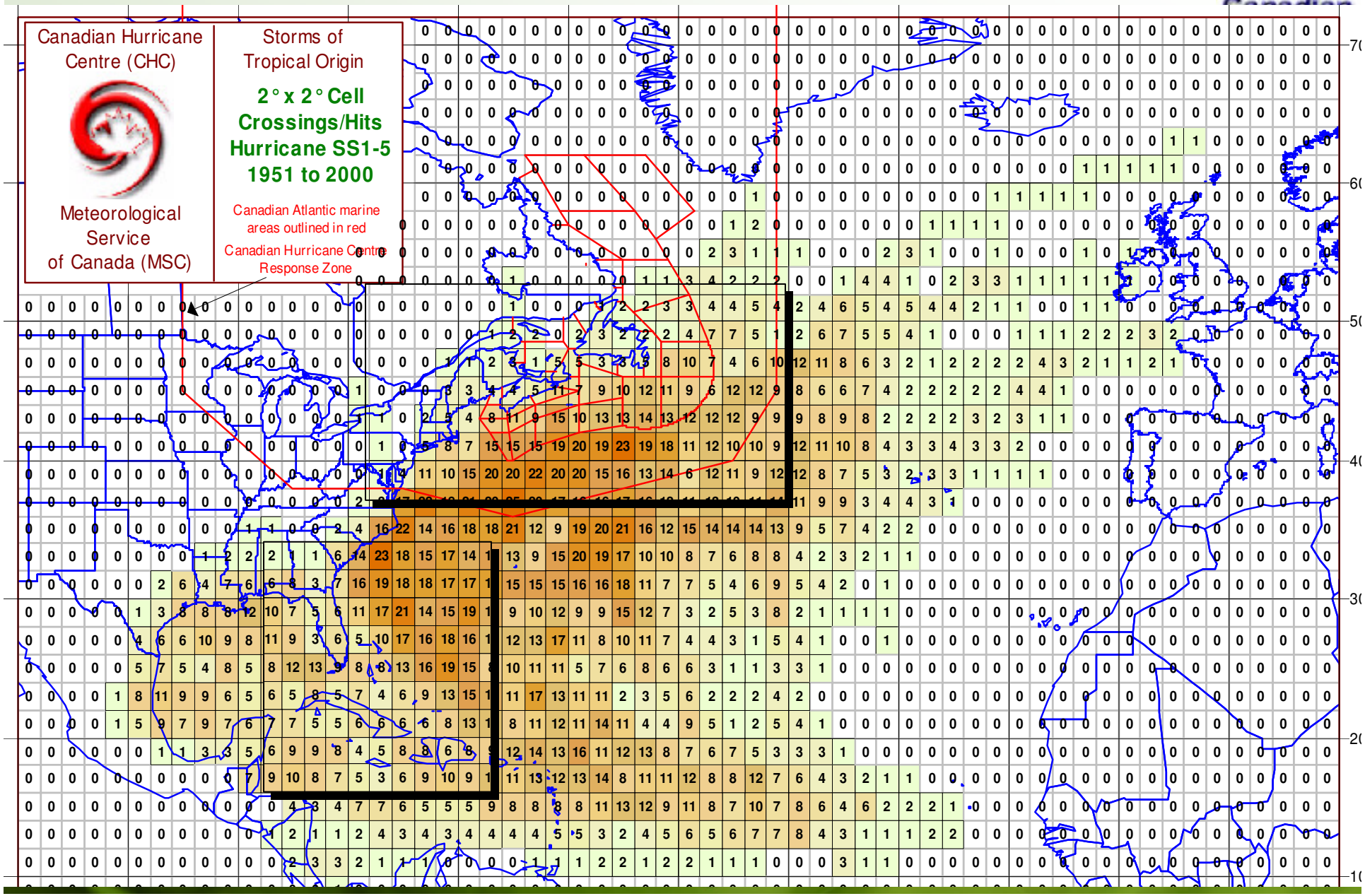
KATRINA

Canadian Hurricane Centre



For the record …

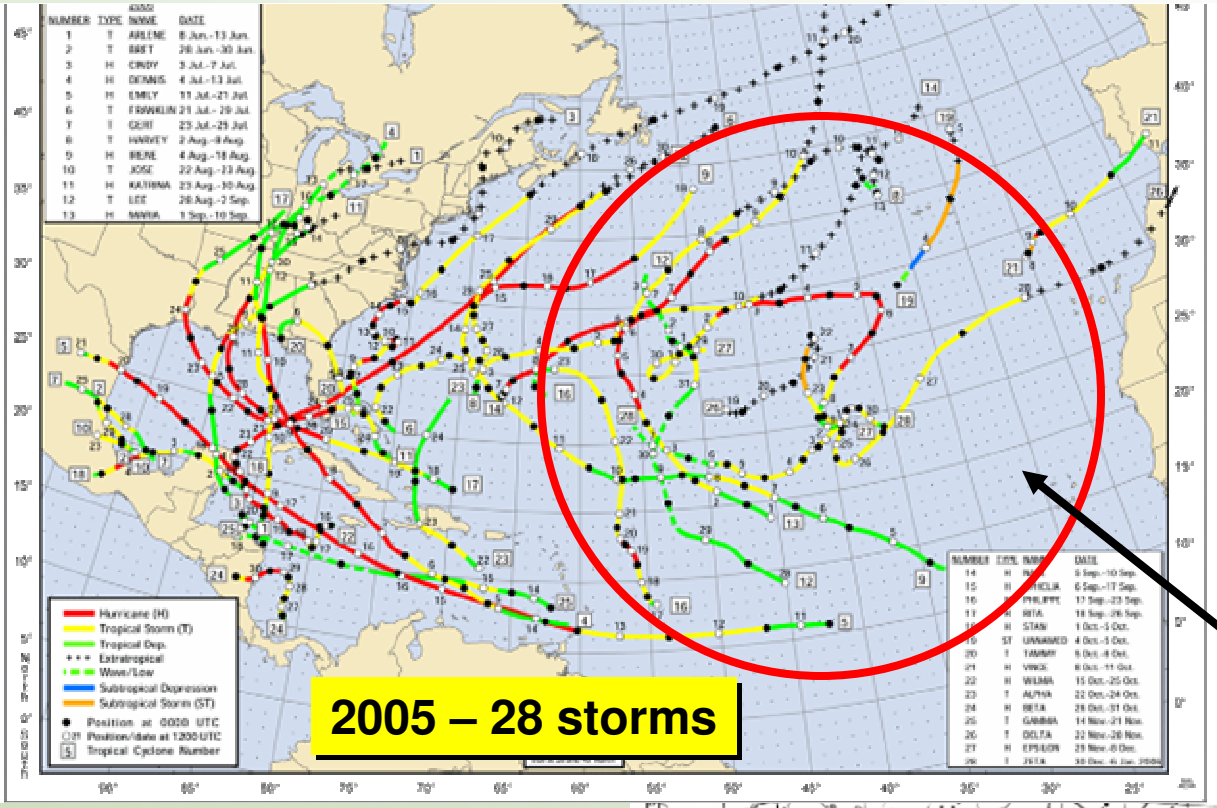
2005



A story of apples and oranges

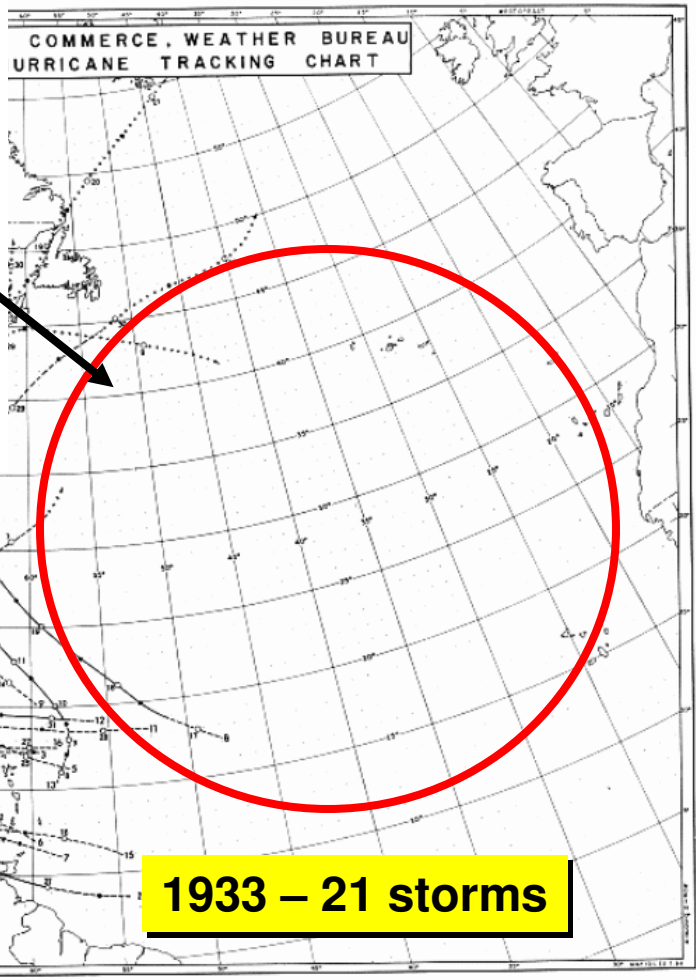
Canadian Hurricane Centre

2006



2005 – 28 storms

21 storms



1933 – 21 storms

The storm they prayed away

2006
FLORENCE

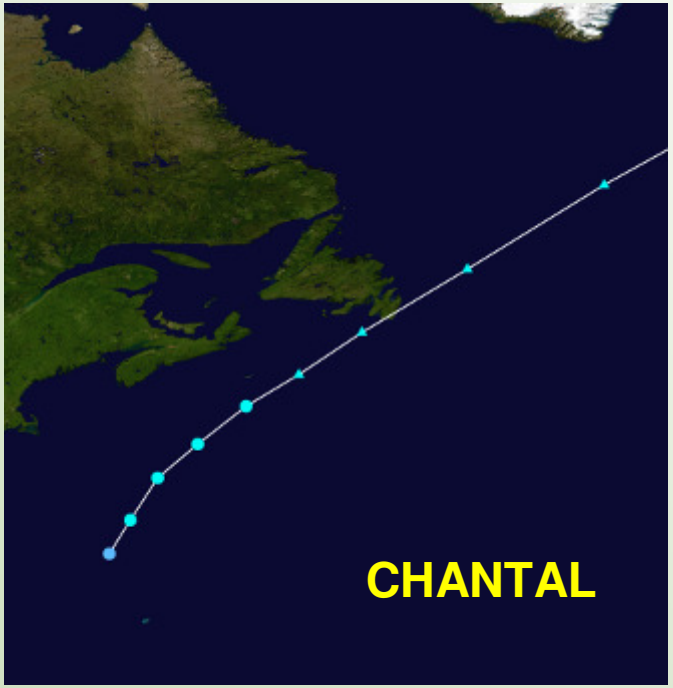
Canadian Hurricane Centre

peak wind reported
163 km/h

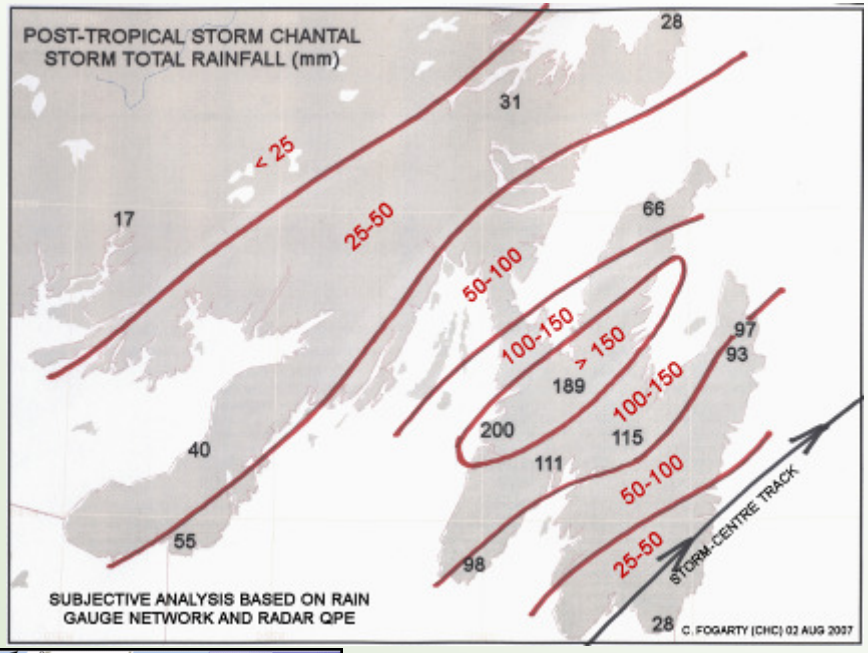
House destroyed in François

State of Emergency!

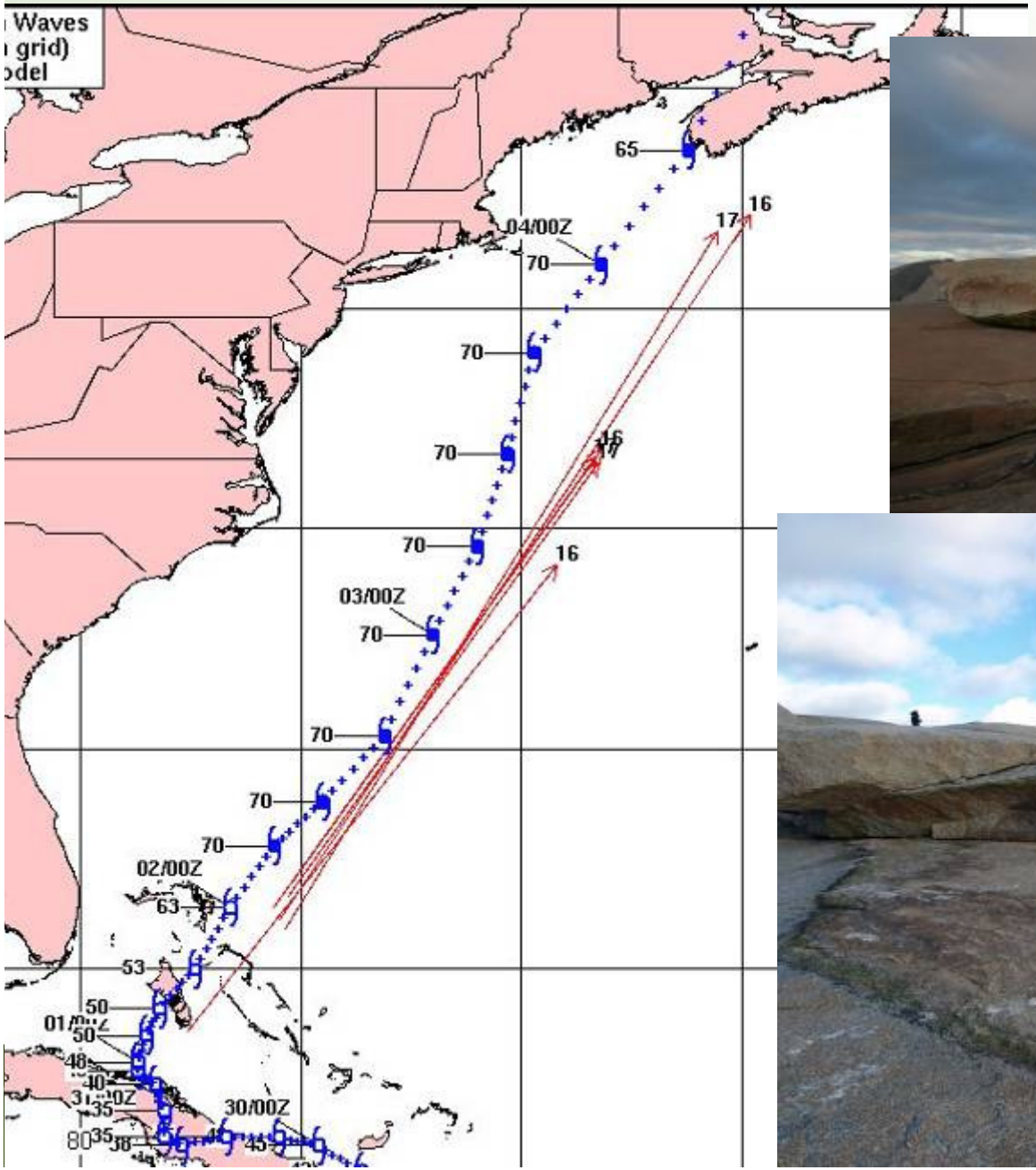
Canadian Hurricane Centre



2007



Noel – waves for the ages



2007

A New Brunswick reminder

Saint John, N.B.

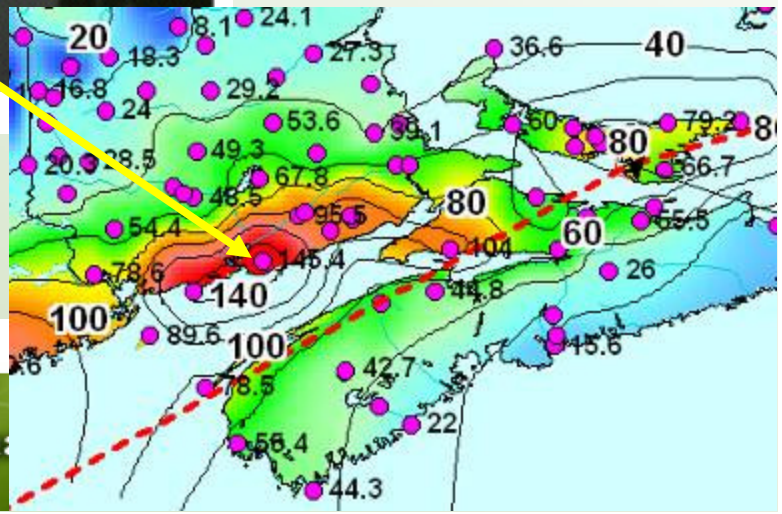
2008

HANNA

Canadian Hurricane Centre

Saint John
146 mm, mostly in 12 hours

Over 30 mm in one hour



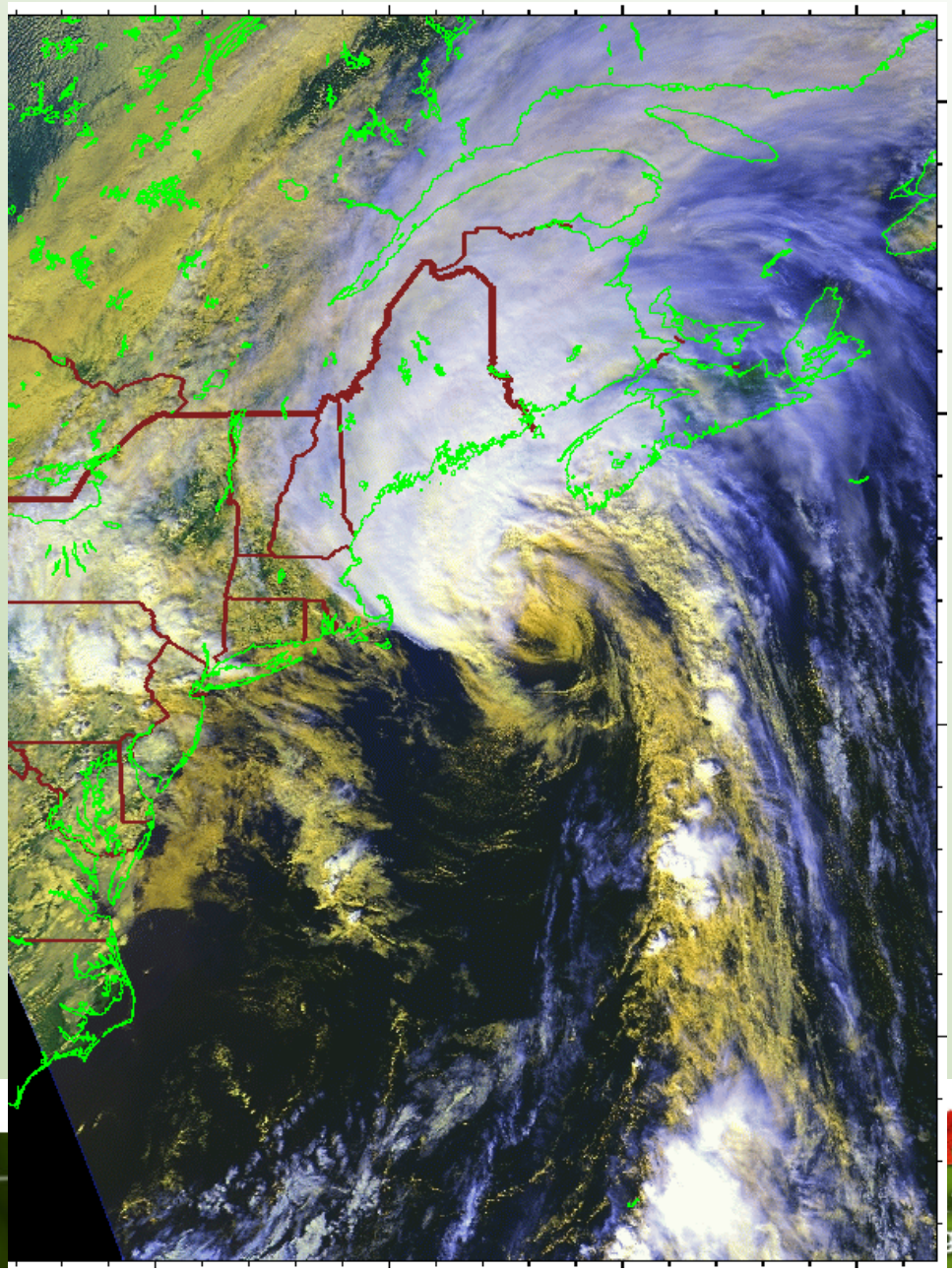
City of Saint John, NB
"Worst rain in 1-2 decades"

Managing expectations

2008

KYLE

Canadian Hurricane Centre



Preparedness Math for Dummies

Canadian Hurricane Centre

Hazard x Vulnerability = Risk of Disaster

therefore

If Vulnerability = 0, Risk of Disaster = 0

VULNERABILITY is a Function of . . .

Canadian Hurricane Centre

- socio-economic issues
- *Predictability* of the hazard
- *Communication** of the threat

**Successful Communication* is linked to awareness and understanding

Canadian Hurricane Centre

MSC challenges include:

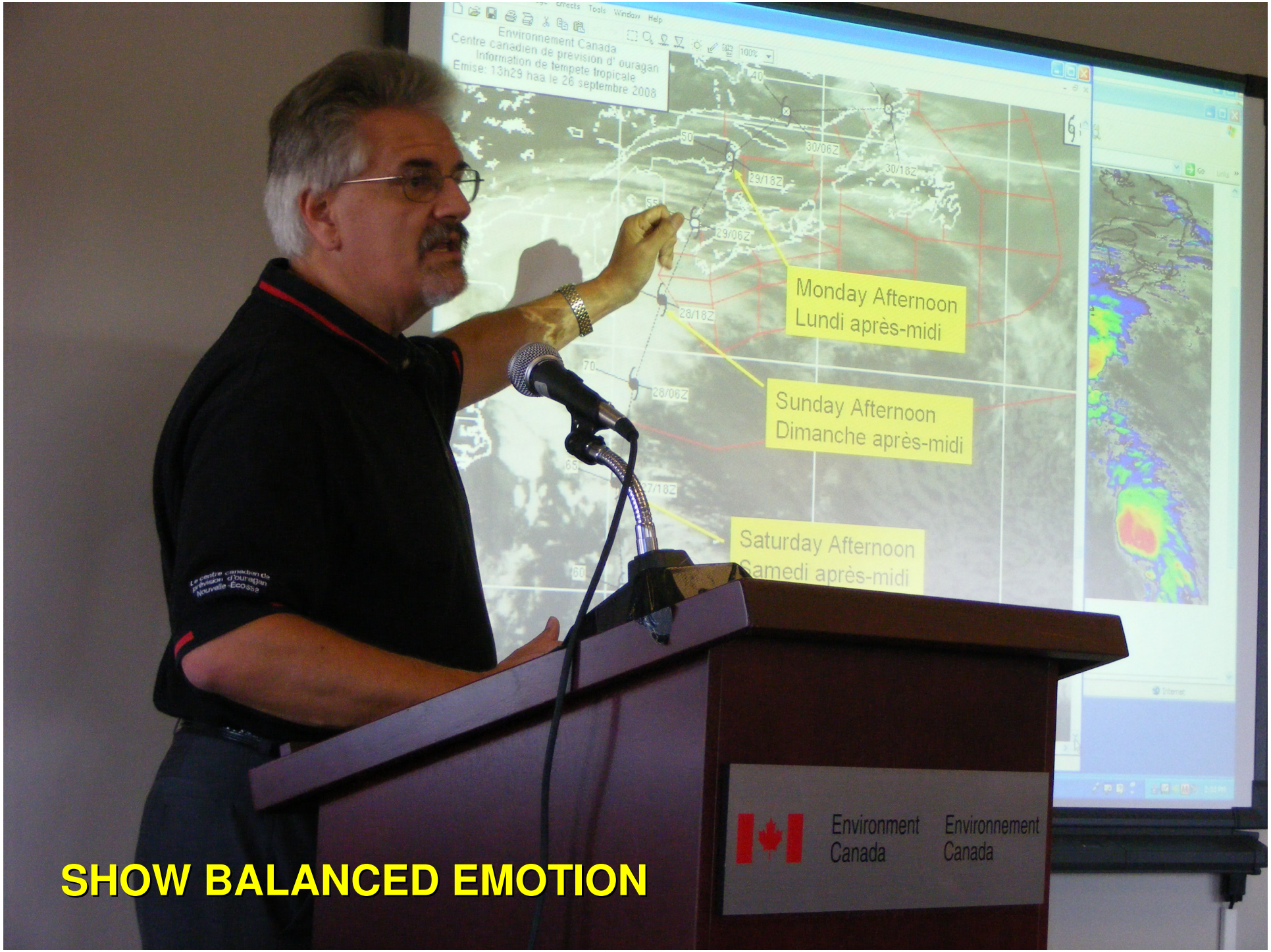
1. Message content – meteorology
2. Message delivery – dissemination
3. Message understanding – how do I use it?

Vulnerability is strongly linked to all three

The “Vanna” approach

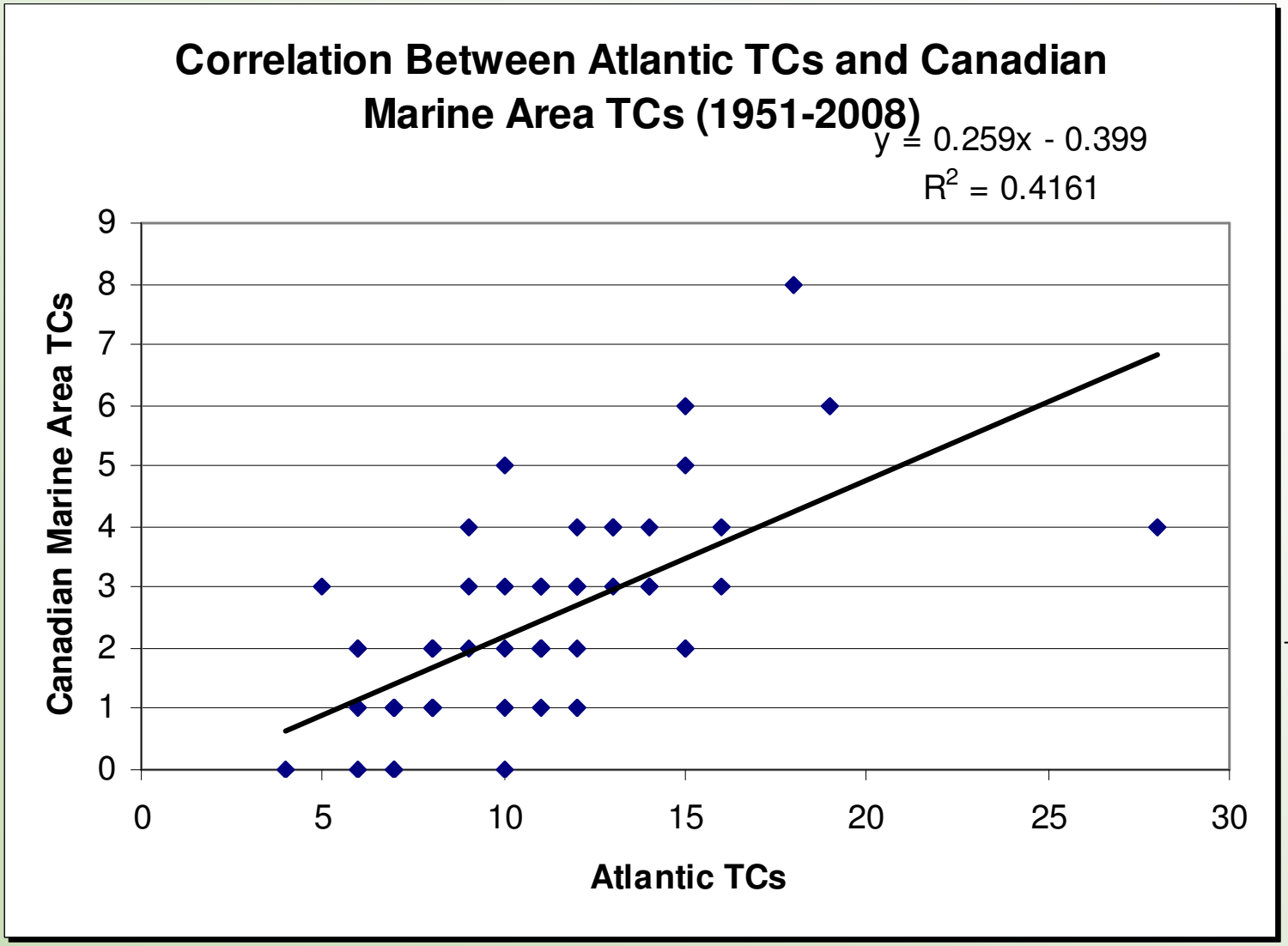
The “Aww Shucks” approach

The "Holy @#$%$#@ " approach



SHOW BALANCED EMOTION

Keeping our eye on the right ball



Canadian Hurricane Centre

2009?

CSU
12 / 6 / 2

NOAA
9-14 / 4-7 / 1-3

TSR
7-14 / 3-8 / 1-4

1951-2000
10.0 / 5.8 / 2.4

1999-2008
15.4 / 7.9 / 3.9

Getting much better … *BUT*

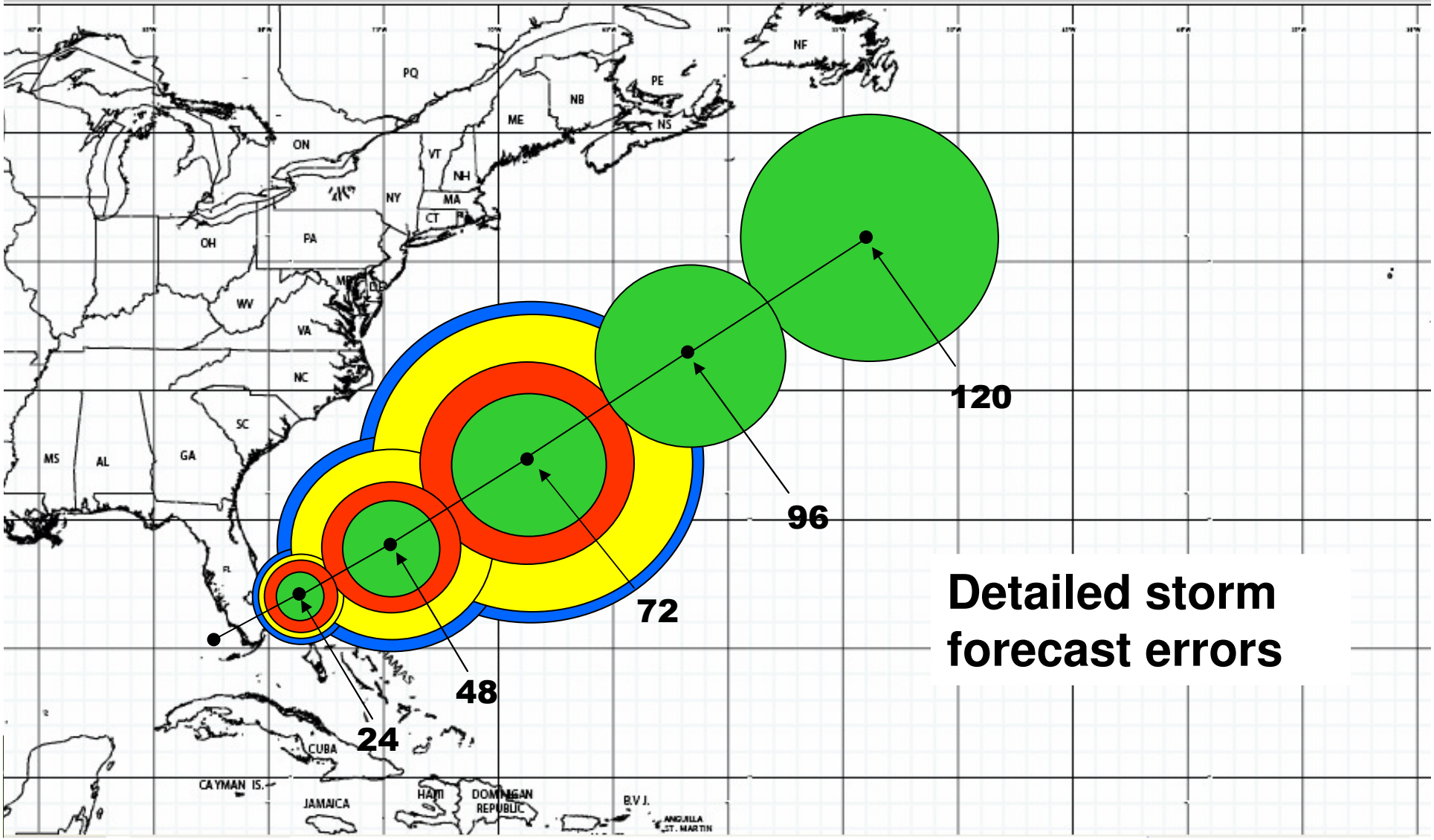
Canadian Hurricane Centre

1970-1979

1980-1989

1990-1999

2000-2008



Detailed storm forecast errors

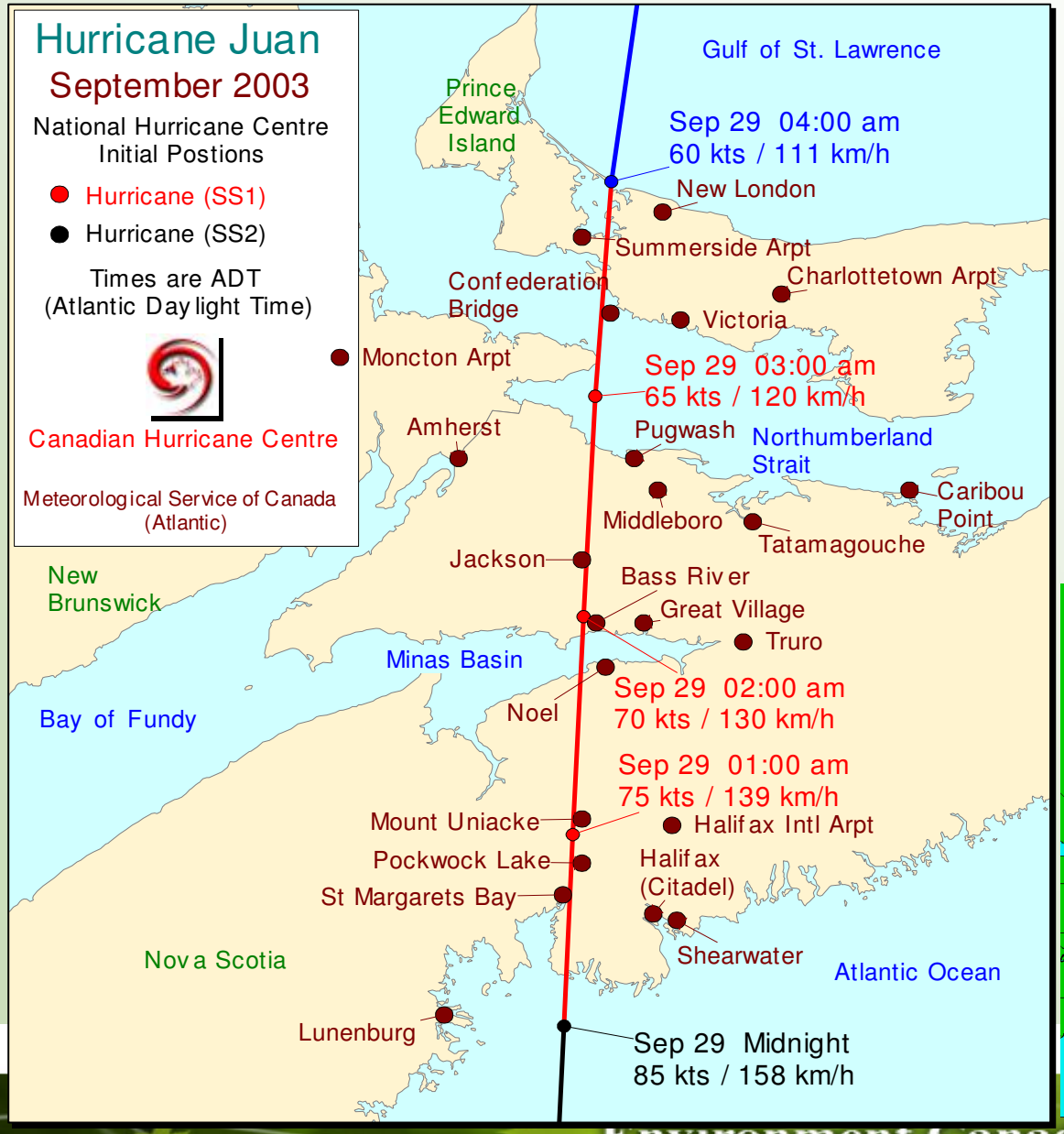
Juan taught us one thing: we have a lot of work to do

Canadian Hurricane Centre

Inexperience – no corporate memory

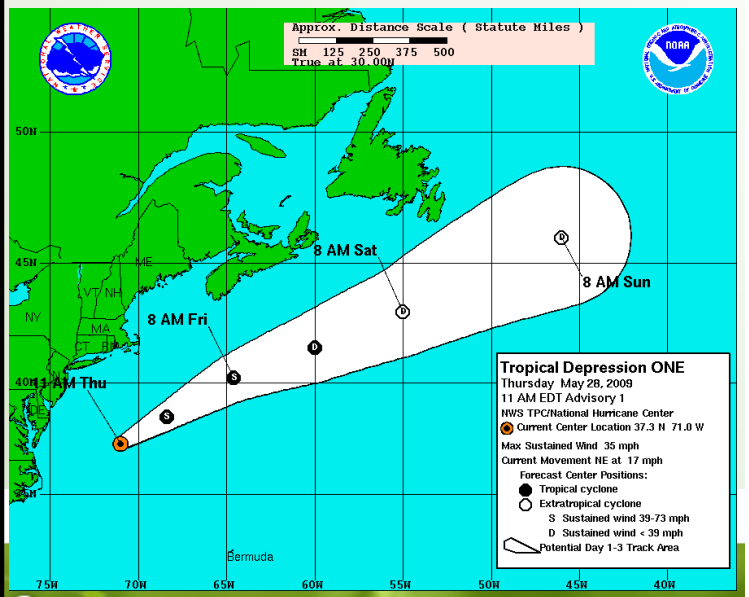
Courtesy: Len Wagg

Curse of the thin line



Canadian Hurricane Centre

"Phew … the eye is going to miss me"

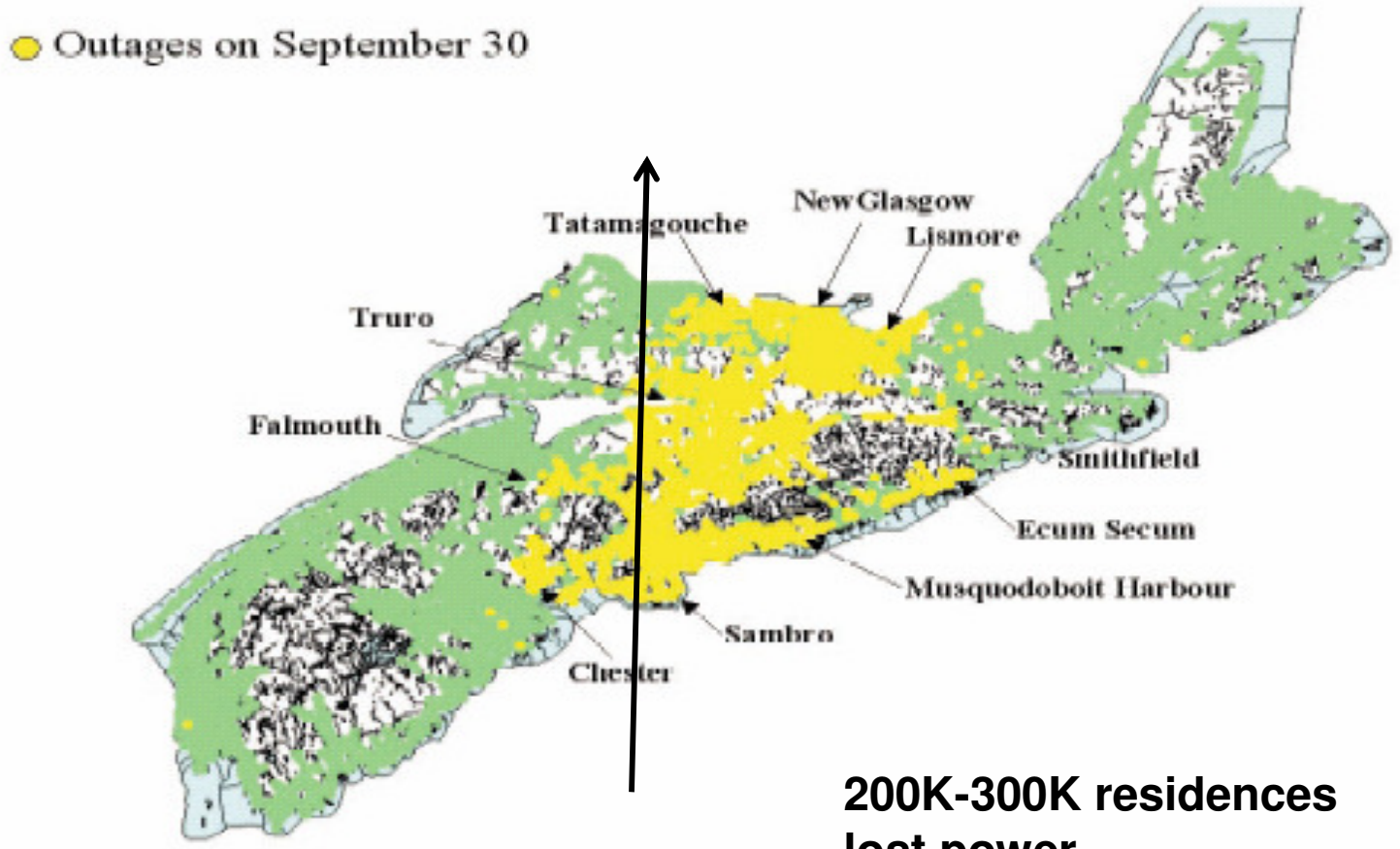


Juan's tree damage

Canadian Hurricane Centre

Juan's power outages

Canadian Hurricane Centre

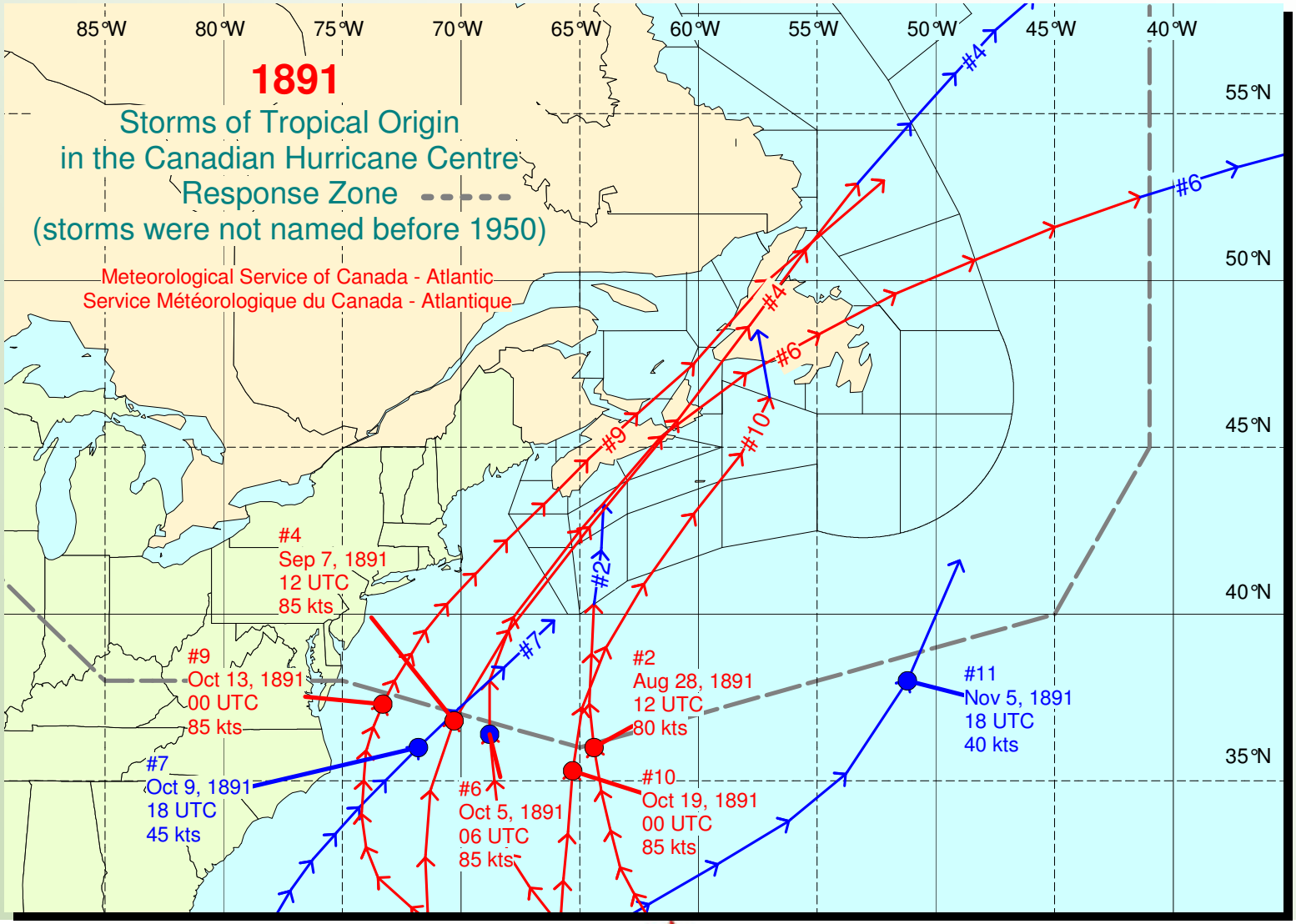


200K-300K residences lost power

Everyone measures grief in their own personal way

Canadian Hurricane Centre

"Lightning doesn't strike twice" … but we're talking hurricanes!



Canadian Hurricane Centre

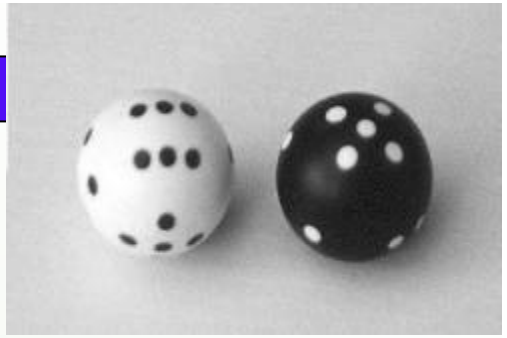
The power of denial

Canadian Hurricane Centre

Never underestimate the power of ignorance and denial when citizens “manage” their risks

Denial leads to higher vulnerability

Misconceptions



- Citizens do NOT understand that perfect forecasts are part of the world of fantasy
- The vast majority of citizens believe probabilistic forecasting is a subjective hedge (a forecaster or weather service deficiency) rather than a scientifically valid measure of uncertainty

Unrealistically

High expectations lead to higher vulnerability

Misconceptions

- Too few citizens understand that different weather patterns, different weather elements, and different time/space scales have differences in predictability

("How accurate are your forecasts?" . . . a good question with a loaded answer)

Ignorance leads to higher vulnerability

Psychological factors

Canadian Hurricane Centre

The “cry wolf” syndrome hinders citizen’s confidence . . . which hinders forecast utility. . .

. . . ***BIG PROBLEM!***

***Ignore*-ance leads to higher vulnerability**

Canadian Hurricane Centre

Boring-ness leads to higher vulnerability

Certainties are more readily accepted by citizens than uncertainties. Certainties are news, uncertainties aren't

This is an enormous problem!

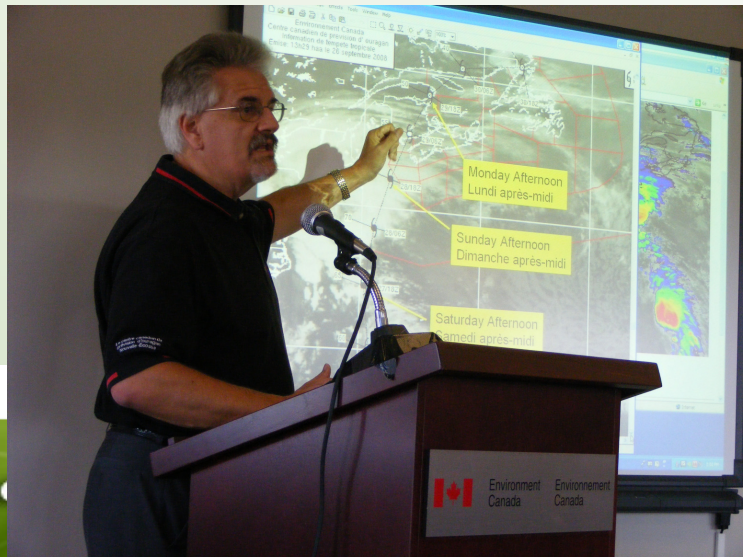
"Get the babies off the street"

Communication factors

Canadian Hurricane Centre

Miscommunication leads to higher vulnerability

A high level of media attention to a potential storm, coupled with experiences (or lack of) with similar recent events, can contribute to a sense of a deterministic event rather than a probabilistic event; uncertainty needs to be more adequately discussed



The "evils" of competitiveness

Canadian Hurricane Centre

There is a poor understanding of the subliminal effects of peer pressure within the forecast community . . . pressures which appear to reduce the communication of uncertainty in forecasts (*machismo is alive and well in forecasting*)

- Significant competitive pressures exist for broadcast meteorologists and weathercasters, and this contributes to some forecasters expressing unrealistic confidence

Over-confidence induces higher vulnerability

Can we put the genie back in the bottle?

Canadian Hurricane Centre

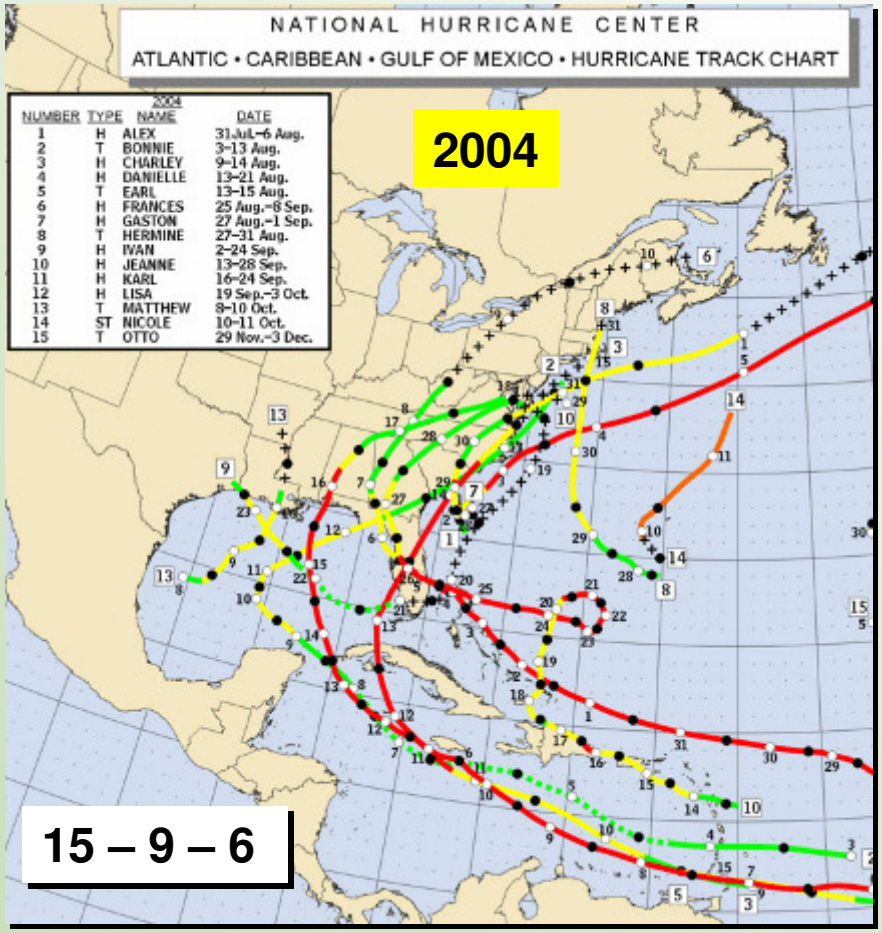
We have MUCH work to do to increase citizen awareness and understanding about the limits of predictability.

Unrealistically

High expectations lead to higher vulnerability

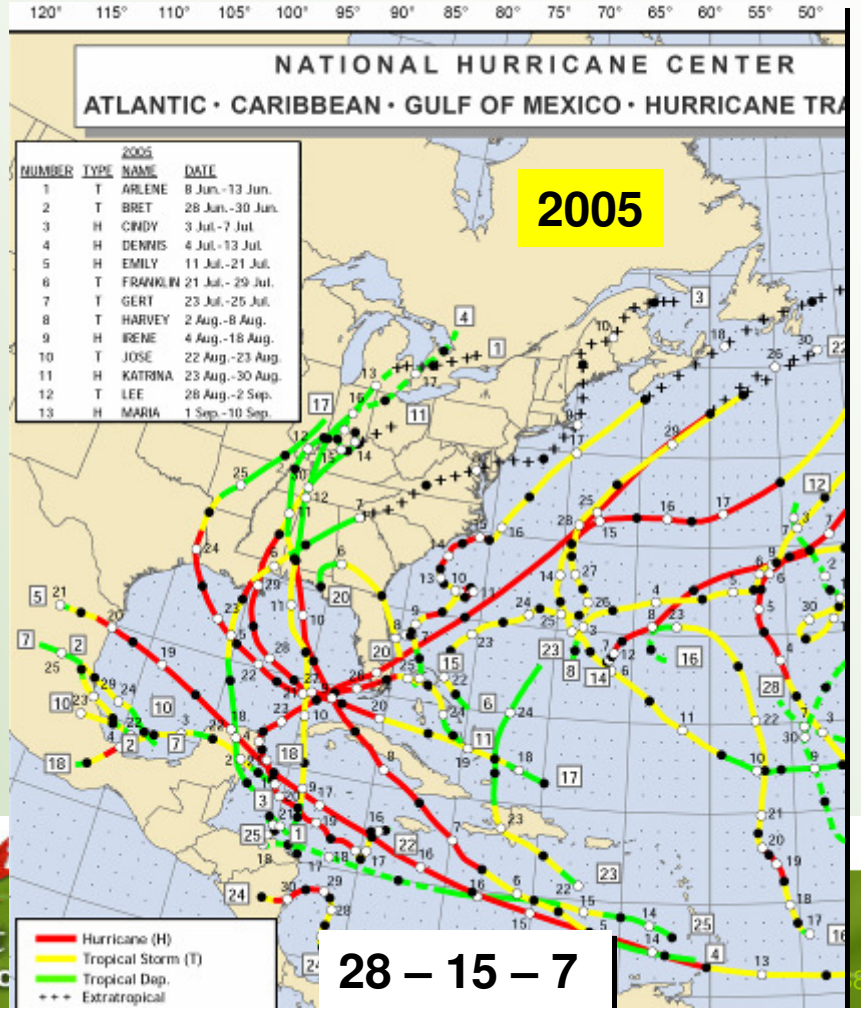
If THEY don't get it ….. ??????????????????

Canadian Hurricane Centre



58%

42%



Mobile Alabama Surveys

Not what you might have expected

Inland TC Fatalities since 1900

Canadian Hurricane Centre

Deaths	Killer Storms	Match the Province
99	9	Ontario
41	13	Quebec
14	3	New Brunswick
7	4	PEI
3	3	Nova Scotia
2	2	Newfoundland

Breakdown of Inland Fatalities up to 2003

Since 2004

NB – 1

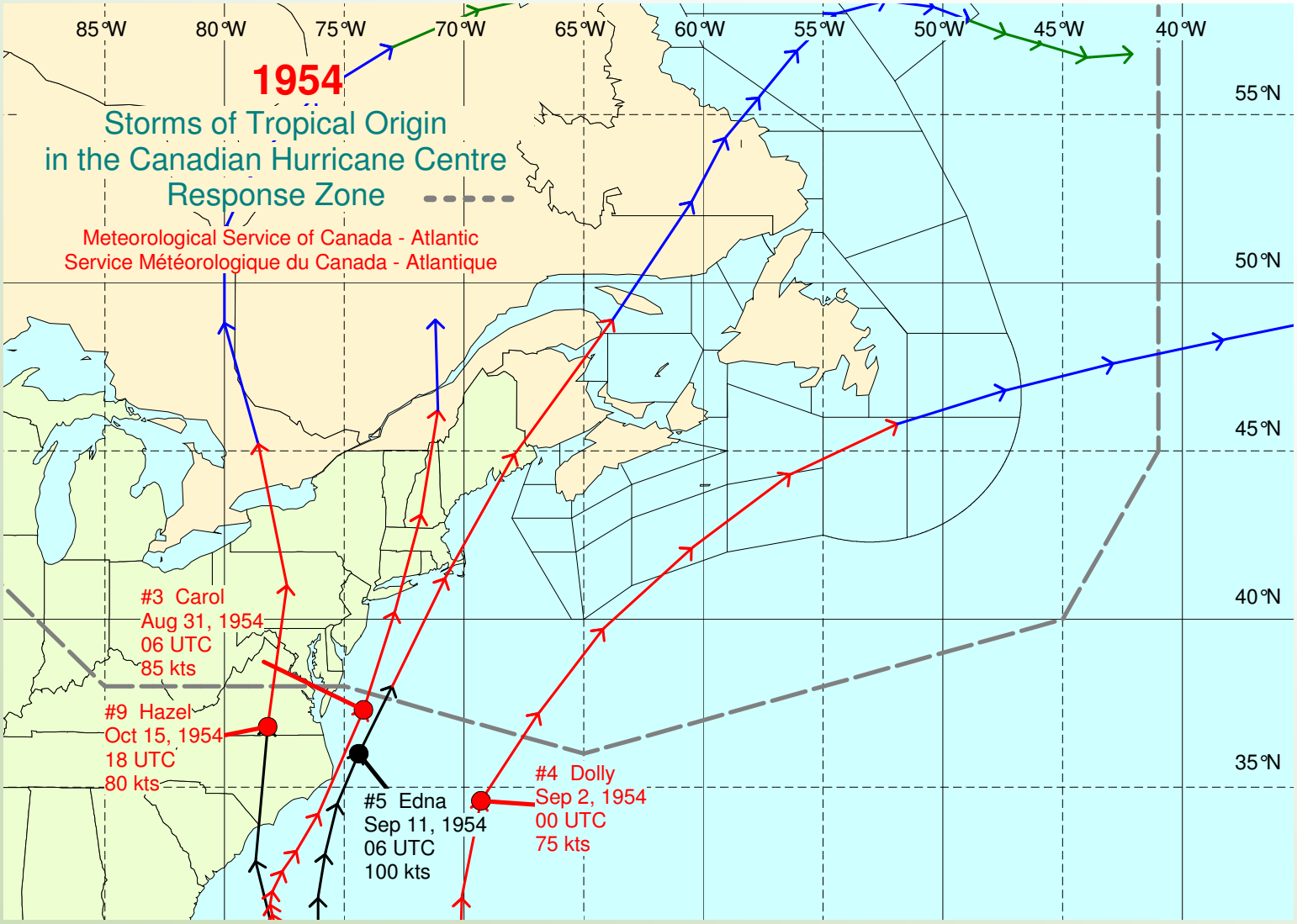
NS – 1

Ndfl – 4

Canadian TC Inland Fatalities Since 1899

#	Killer Storm	Ont	Que	NB	NS	PEI	Nfld	Total
1	1954-Hazel	81						81
2	1957-Audrey	5	10					15
3	1927-1				11			11
4	1921-1				7			7
5	1962-Daisy				6			6
6	2003-Juan				6			6
7	1915-1	5						5
8	1941-2	3						3
9	1949-2		3					3
10	1950-Able				2			2
11	1968-Gladys				1	1		2
12	1991-Bob				2			2
13	1900-1	1						1
14	1900-5			1				1
15	1904-2				1			1
16	1923-2						1	1
17	1938-4	1						1
18	1940-5			1				1
19	1944-7				1			1
20	1948-6						1	1
21	1954-Edna				1			1
22	1955-Connie	1						1
23	1960-Donna		1					1
24	1971-Beth				1			1
25	1976-SubTropical 2	1						1
26	1989-Gabrielle				1			1
27	1995-Luis						1	1
28	2002-Gustav					1		1
29	2003-Isabel	1						
	Total	**99**	**14**	**2**	**40**	**2**	**3**	**160**
	# Killer Storms	9	3	2	12	2	3	

Really bad years are still out there



Canadian Hurricane Centre

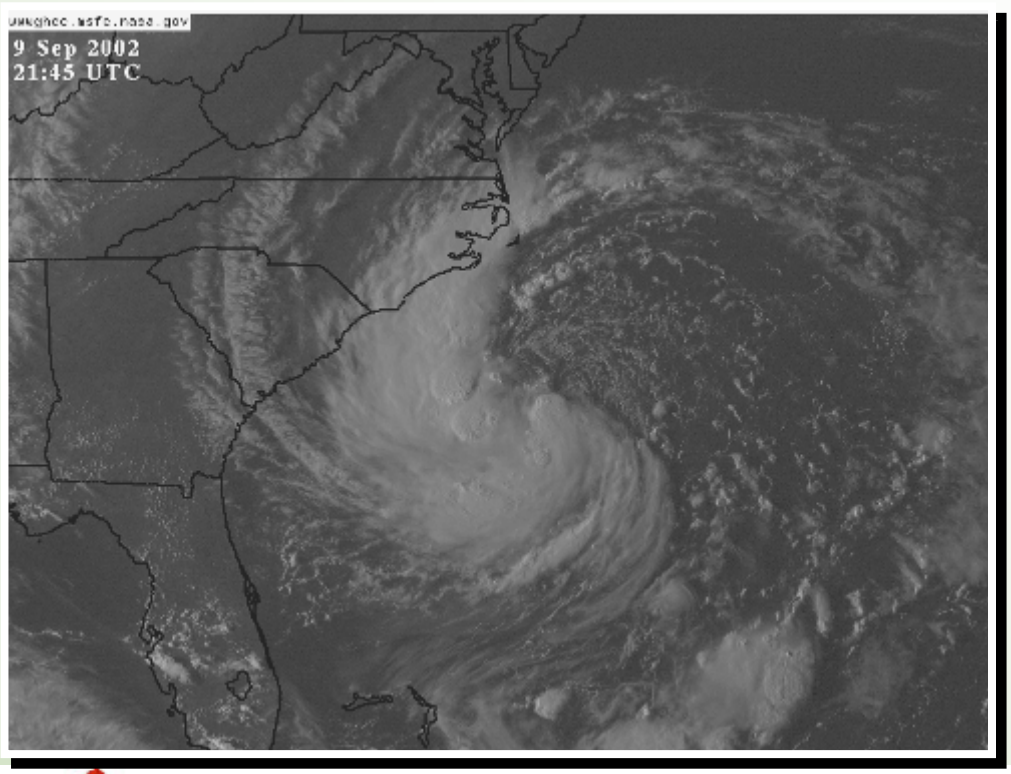
One storm can ….

Canadian Hurricane Centre

- 1 storm can create years of work for a lot of people
- 1 storm can bring about a significant change in awareness of vulnerability
- 1 storm can highlight weaknesses in any well-laid plan

Hurricane communications is a harmony, not a tug-of-war

Canadian Hurricane Centre



Canadian Hurricane Centre

Don't Be Scared

Just Be Prepared