UNCLAS

Presentation to the Offshore Helicopter Safety Inquiry

Canadian Forces Search and Rescue

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(Director Air Force Readiness)

January, 27, 2010

Outline

- Historical Context
- Organization
- SAR Capabilities and Resources
- Operations

Historical Context

- Origins of Search and Rescue
- Prior to and the mid-1940's
  - Formal SAR in Canada did not exist
  - Best efforts of the closest vessel or aircraft
  - Searches usually directed by RCMP (or local police force)

Historical Context

- Evolving trends…
  - Aviation increasing (domestic and international)
  - Need for a structured SAR organization
    - Highly trained personnel
    - Specialized equipment
    - Facilities to control and coordinate response

Historical Context

- Interdepartmental Committee on SAR (ICSAR)

  in its early years

  - Justice
  - Defence
  - Fisheries
  - Transport

Canada

Historical Context

- Initial ICSAR direction
  - Make use of existing resources and services wherever possible and structure them to provide adequate response capabilities
  - Additions to be made in the “most economical manner compatible with reasonable efficiency”

Historical Context

- 1947 – Federal Cabinet Decision
  - RCAF to provide and coordinate Aeronautical SAR services
  - ICSAR Chair - Defence
  - Rescue Coordination Centers
  - Capitalize on existing capabilities, resources and command structure
- 1951 - Addition of Maritime SAR Mandate

Historical Context

- RCAF Mandate
  - The primary responsibility for the provision of aeronautical search and rescue (SAR) services and effective operation of the coordinated aeronautical and maritime SAR system.
  - Remains valid today as CF SAR mandate…

Historical Context

- 1960 – Formation of the Canadian Coast Guard (CCG)
  - On-water provision of Maritime SAR
  - CG Officers as Marine Coordinators
    - "Joint" Rescue Coordination Centers
- Mid-1960's – Unification of Tri-services
  - Canadian Armed Forces (1968)
  - RCAF Restructure
    - From 160 000 to 16 000 members
  - Command structure and resource impact

Organization

Federal Approach to SAR

Vision:

A Canada where the critical importance of Search and Rescue is reflected in a multi-jurisdictional approach to promoting individual, collective and organizational behaviours that minimize the risk of injury and/or loss of life and maintaining timely and effective response services

Objectives:

SAR Prevention

- To influence individuals and organizations on the assessment of risks and the importance of acquiring and using appropriate knowledge, skills and equipment

SAR Response

- To ensure an effective SAR Response (capability) in all areas of Canada

Organization

Program Objectives

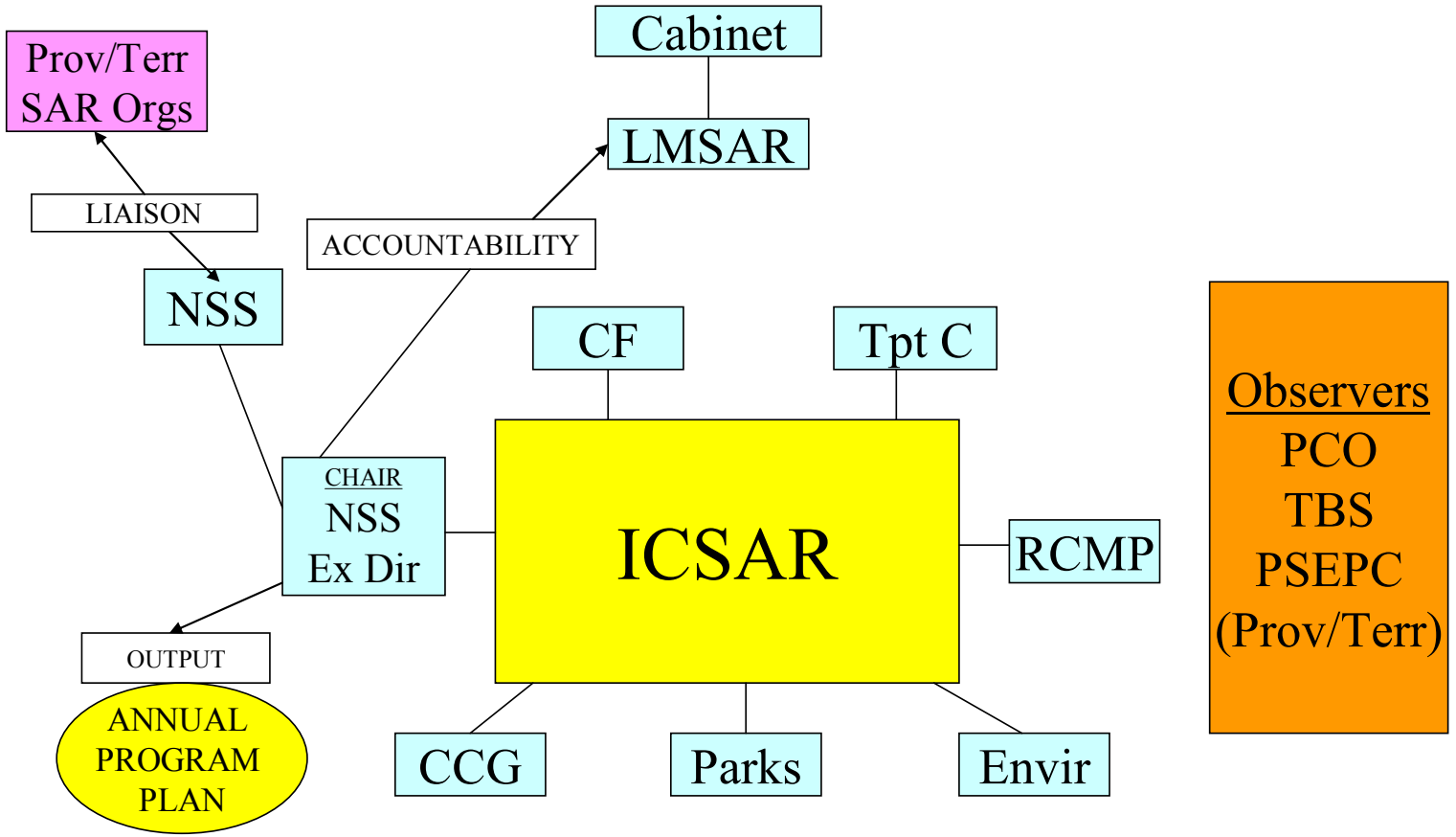
- **Preferred as it saves everyone**
- Activities that are motivated to reduce or even eliminate the incidents of distress
- Noble cause, however, it is unreasonable to expect that it will ever achieve 100% success

- The requirement for survivors to survive long enough for rescue to be effective
- **Increase survival time and the prospect of rescue**

- Necessary when prevention is overcome by circumstances
- SAR response accomplished by resources (external to the distress incident) that are capable of rendering assistance prior to the exhaustion of survival time
- **Shorten SAR delivery time**

Organization

NATIONAL SAR PROGRAM MANAGEMENT



Organization

- Today's National SAR Program federal partners…
  - NSS (ICSAR Chair and Advisor to LMSAR)
  - CF (Aeronautical SAR and Overall Coordination)
  - CCG (Maritime SAR Component)
  - RCMP (Spokesperson for Non-Federal SAR)
  - Parks Canada (National Parks)
  - Transport Canada (SAR Prevention)
  - Meteorological Services Canada

Organization

Federal SAR Structure

- To establish a single spokesperson for the federal government on overall SAR matters, the Prime Minister, in Dec 76, identified the Minister of National Defence as the Lead Minister for SAR (LMSAR) and spokesperson for the federal government on SAR.
- 2 independent bodies advise LMSAR
  - Interdepartmental Committee on SAR (ICSAR)
    - Comprised on senior officials of the federal departments that execute the SAR program
    - Advises on SAR policy and planning
  - National SAR Secretariat (NSS)
    - Independent body outside line authorities for SAR delivery
    - Coordinates, promotes and reviews the National SAR Program

Canada

Organization

- NSS Mandate and Role
  - To enhance the provision of effective, efficient and economical SAR services in Canada by facilitating the development of the National Search and Rescue Program (NSP).
  - A central managerial role to facilitate the co-operation, communication and co-ordination among NSP members in the development of policy, resource planning, research and development, analysis and review.

Organization

Functional SAR roles:

- DFO / Canadian Coast Guard:
  - Provide the maritime component for maritime SAR response
  - Provide maritime SAR incident response coordination through Canadian Forces Joint Rescue Coordination Centres (JRCCs) and Coast Guard Marine Rescue Sub-Centres (MRSCs)

- DND / Canadian Forces:
  - Provide the aviation component for maritime and aeronautical SAR response
  - Provide aeronautical SAR incident response coordination
  - Overall effective operation of the coordinated aeronautical and maritime SAR system

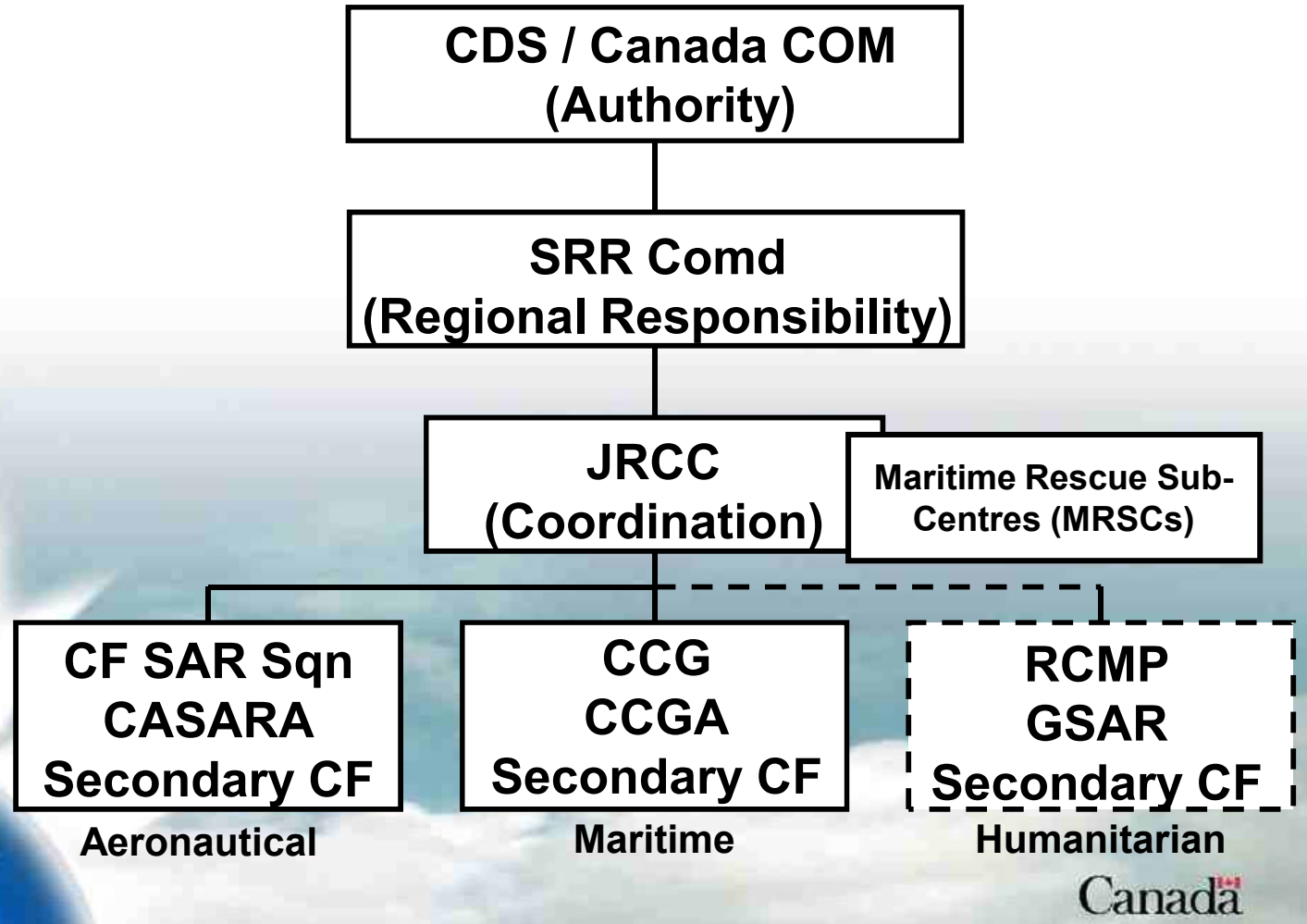
Organization

Within DND/CF:

- The responsibility for the execution of CF SAR activities rests with the Commander of Canada Command
  - All SRR commanders report to Commander Canada Command
- The Chief of the Air Staff is responsible for providing search and rescue aircraft to Commander Canada Command
  - Also is responsible for
    - Strategic SAR Policy in DND
    - Liaison with National SAR Secretariat
    - DND representative to ISCAR
    - Liaison with other national and international SAR departments

Organization

CF SAR Response Delivery



Organization

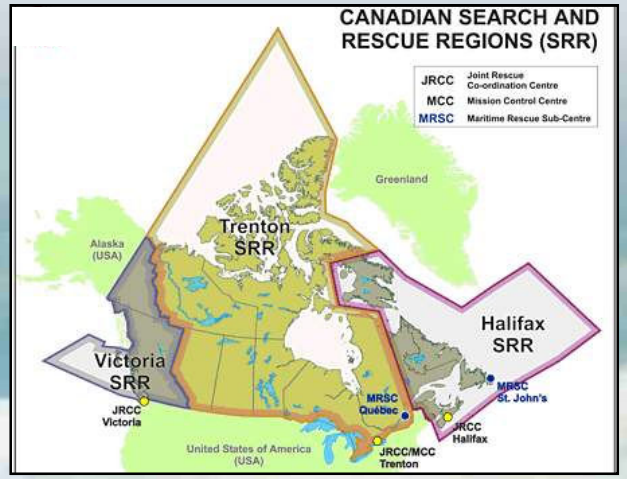
- Constitutionally,
  - Federal government has responsibility for coastal and ocean SAR
  - Provincial governments have responsibility for inland ground and water searches
- SAR coverage includes:
  - Nation's landmass
  - 1000 nm into the North Atlantic
  - 800 miles in the Pacific
  - to the Pole in the Arctic

Canada

Organization

Maritime and Aeronautical SAR

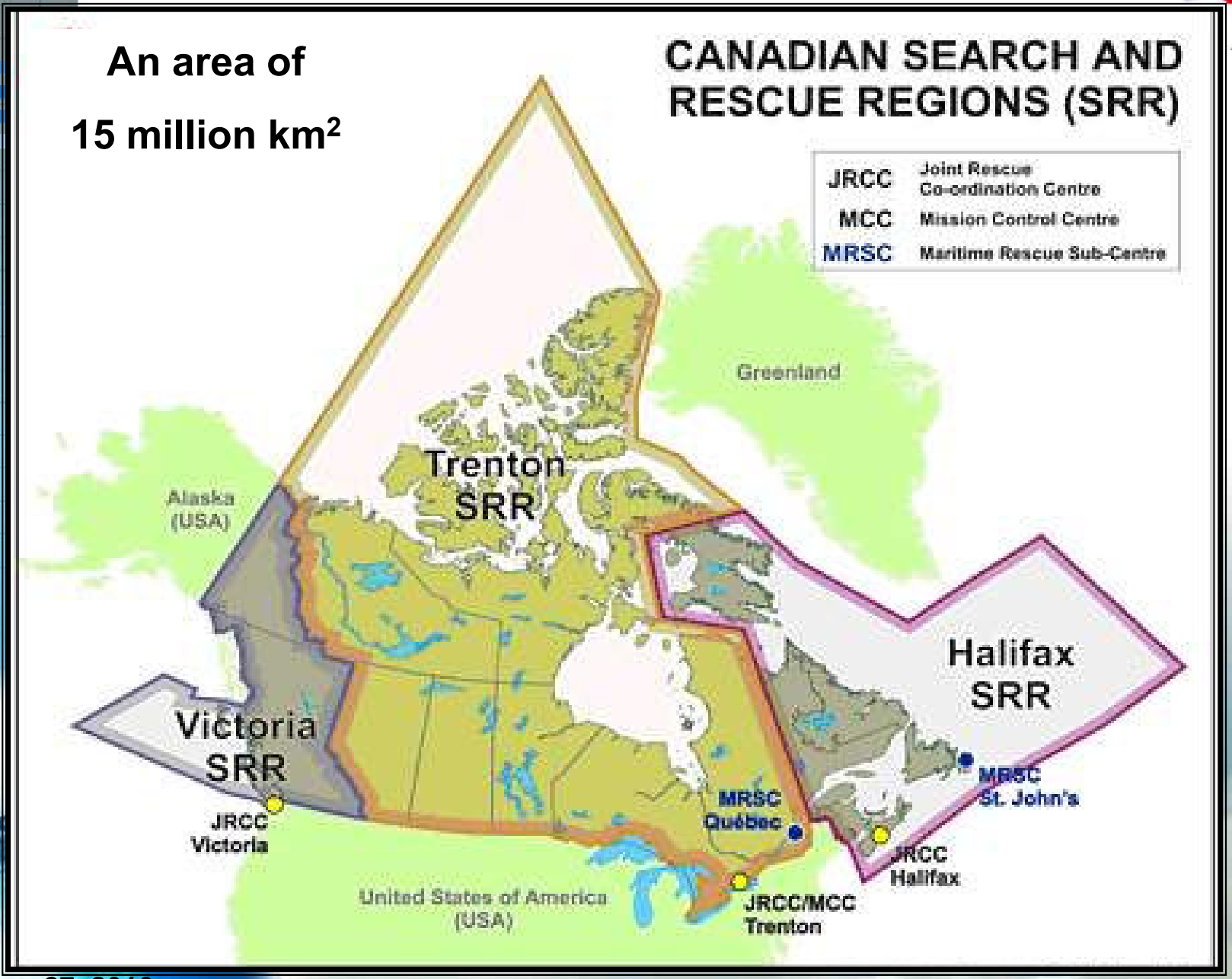
- Canadian SAR Area of Responsibility **(15 million km²)**
  - Established in accordance with
    - the International Maritime Organization (IMO), and
    - International Civil Aviation Organization (ICAO)
    - Maritime & Aeronautical boundaries are harmonized
  - 3 SAR Regions (SRR)
    - Halifax
    - Trenton
    - Victoria



Canada

An area of

15 million km²



Organization

"Timeliness of response, which usually depends on the proximity of rescue resources to incidents, is a critical factor in saving people in distress. Our review….noted that even in areas where federal search and rescue resources were available, other resources often performed the rescue because they were closer to the scene"

- 1992 Auditor-General's Report [Canada]

- **Leverage the resources that are present in the region**
  - **vessels / aircraft / resources of opportunity**

- **The federal safety net assures that SAR resources are available:**
  - **Canadian Forces and Canadian Coast Guard <u>dedicated</u> SAR aircraft and vessels**
    - **Quantities are constrained by resource limitations**
    - **Impossible to be "ever-present" "everywhere"**

Canada

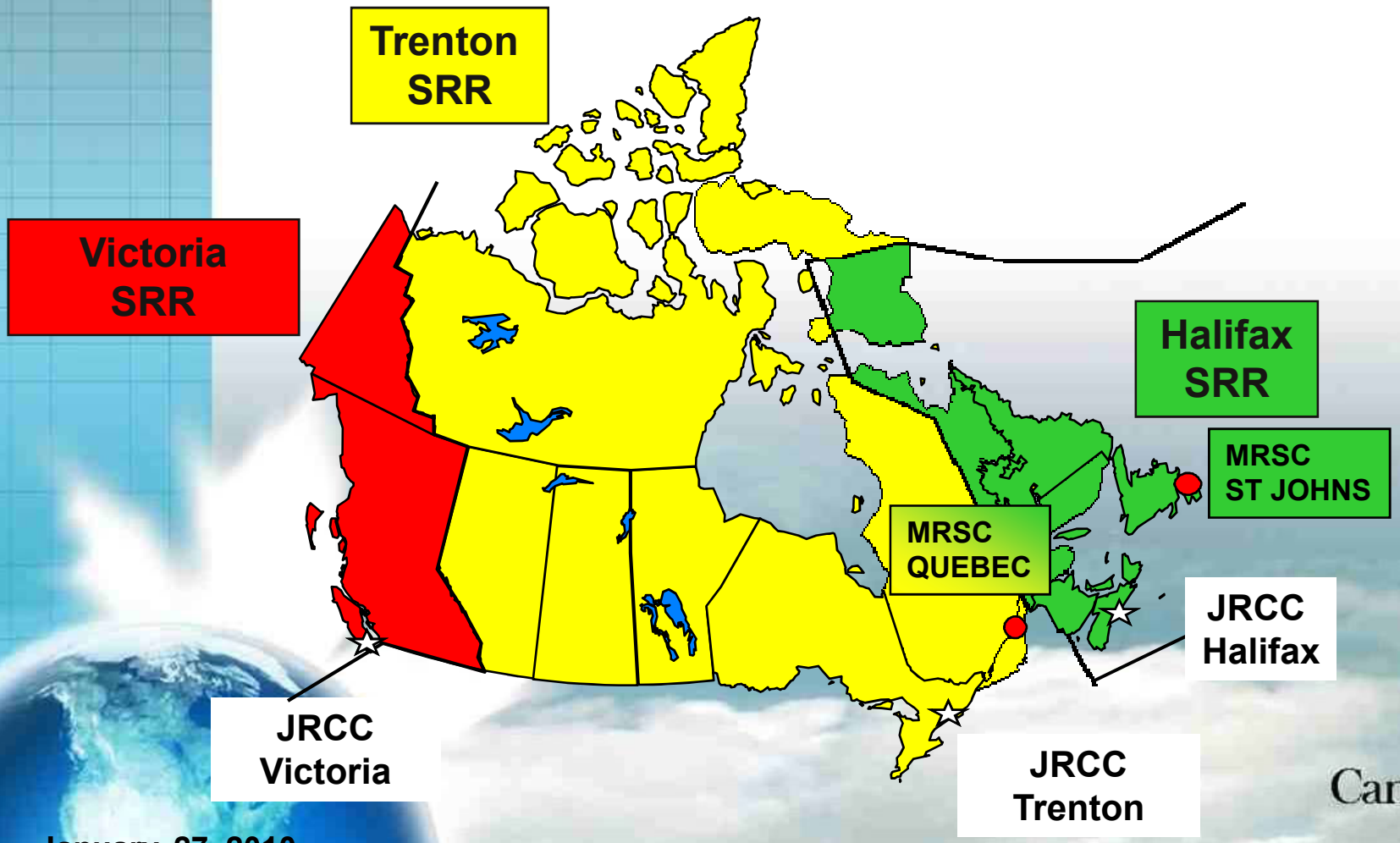
SAR Capabilities and Resources

Canadian Aeronautical & Maritime SAR System

- **Response Coordination**
  - **3 SAR Regions (SRRs)**
    - **Joint Rescue Coordination Centre (JRCC)**
      - **Maritime Rescue Sub-Centres (MRSCs)**
        - ✓ **Quebec**
        - ✓ **St John's**
    - **Canadian Mission control Centre (CMCC)**
- **Response Delivery**
  - **Dedicated Search and Rescue Units**
  - **Canadian Coast Guard Vessels**
  - **Volunteer organizations**
  - **Commercial assets**

SAR Capabilities and Resources

Coordination Centres



SAR Capabilities and Resources

Joint Rescue Coordination Centre (JRCC)

Role

- Coordination of the overall response to federal aeronautical and marine incidents

Particulars

- 24/7 operations
  - CF Manning
    - 1 x Maj – OIC
    - 6 x Capt – Air Coordinators
    - 4 x Assistant Air Coordinators
  - CCG Manning
    - 1 x Regional Supervisor Marine SAR (RSMS)
    - 8 x Marine Coordinators
    - 4 x Assistant Marine Coordinators (summer)

SAR Capabilities and Resources

Web: WWW.JRCCHALIFAX

Canada

SAR Capabilities and Resources

JRCC Personnel

- Officer in Charge (OIC) JRCC
  - Qualified CF SAR pilot or navigator
    - Shall have successfully completed Searchmaster course and unit On-Job-Training
    - Should have successfully completed the RCC/Maritime Rescue Sub-Centre course (MRSC)
  - Responsible to SRR Commander for the effective and efficient management of the JRCC
- Deputy OIC JRCC
  - Qualified CF SAR pilot or navigator
  - Duties include
    - Act as OIC JRCC in his/her absence
    - Fulfilment of duties as aeronautical coordinator, when so employed

SAR Capabilities and Resources

JRCC Personnel

- Regional Supervisor Maritime SAR (RSMS)
  - Senior CCG Officer assigned to JRCC
    - Responsible to ensure the continuing effectiveness of the maritime SAR system within the SRR except for those areas assigned to MRSCs

SAR Capabilities and Resources

JRCC Personnel

- SAR Mission Coordinator
  - Aeronautical
    - Qualified CF SAR pilot or navigator
      - RCC/Maritime Rescue Sub-Centre (MRSC) Controller course
      - Searchmaster Course
      - Applicable unit On-Job-Training
  - Maritime
    - Qualified CCG Ships' navigation officer
      - RCC/Maritime Rescue Sub-Centre (MRSC) Controller course
      - Fundamental Maritime SAR course
      - Applicable unit On-Job-Training

SAR Capabilities and Resources

JRCC Communications

- Recorded telephone lines
- Wireless networks and frequencies
  - HF – 5680 kHz (we use 5717)
  - VHF - 123.1 MHz (international voice VHF)
  - FM - Ch 16 (working freq 22A)
  - UHF – 246.2 MHz Cdn, 282.8 NATO
- VTS
  - Coast Guard FM radio network
- Search and Rescue IT Network
  - DND and DFO interface

SAR Capabilities and Resources

SMMS

- Search and Rescue Mission Management System
  - Strength of the SAR Coordination System
    - Computer based system integrating:
      - Reference resources (access to aircraft/vessel registration databases, etc)
      - Mapping resources
      - COSPAS/SARSAT Information
      - Log, Record and Data keeping

SAR Capabilities and Resources

Maritime Rescue Sub-Centre (MRSC)

Role

- Augment the coordination of maritime response to federal marine incidents in regions of greatest activity (St Lawrence Seaway and Eastern Approaches)
- Subordinate to parent JRCC responsible for the SRR

Particulars

- 24/7 operations
  - CCG Manning
  - Co-located with CCG Maritime Traffic Communication Services (MTCS)

SAR Capabilities and Resources

Canadian Mission Control Centre (CMCC)

Role

- Receive, analyze and distribute distress beacon alert information obtained from COSPAS/SARSAT system
  - Distress beacons
    - ELTs, EPRIBs and PLBs transmitting on 406 Mhz

Particulars

- Co-located with JRCC Trenton at 8 Wing
- Staffed 24/7
  - CF and DND Civilian personnel
  - 1 x Maj Officer-In-Charge
  - 7 x Controllers
- Canadian Beacon Registry for 406 MHz beacons (contact information/ vessel or aircraft information)

Canada

SAR Capabilities and Resources

Types of Electronic Distress Beacons

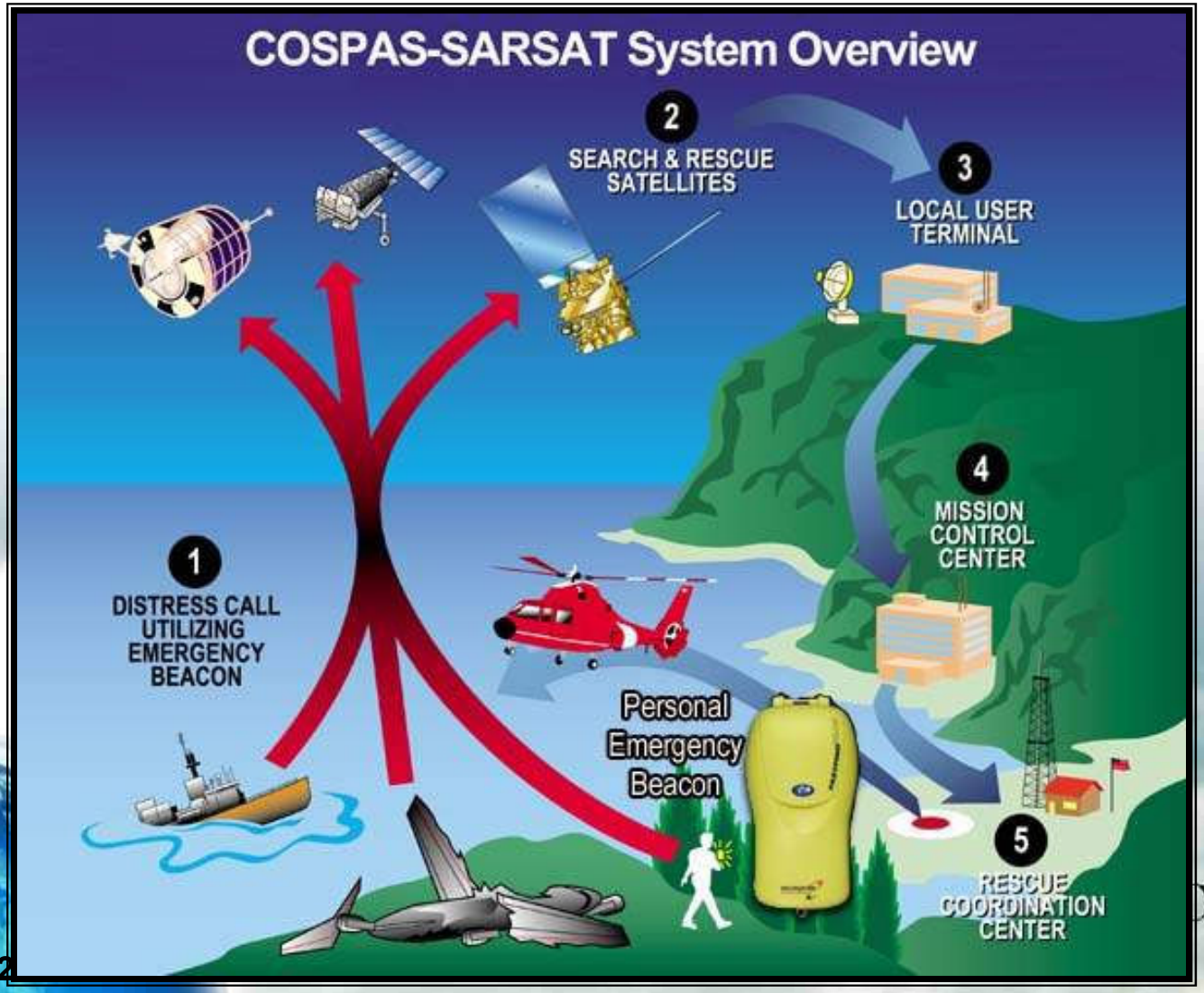
- PLB (*Personal Locator Beacon)*
  - *Manually activated*
  - *121.5 MHz, 243.0 MHz, or 406 MHz*

- ELT (*Emergency Locator Transmitter)*
  - *Impact or manually activated*
  - *Fixed or jettison-able*
  - *121.5 MHz, 243.0 MHz, 406 MHz*

- EPIRB (Emergency Position Indicating Radio Beacon)
  - Activated manually or by float activated switch
  - *121.5 MHz, 406 MHz*

SAR Capabilities and Resources

Search and Rescue Satellite-Aided Tracking (SARSAT)



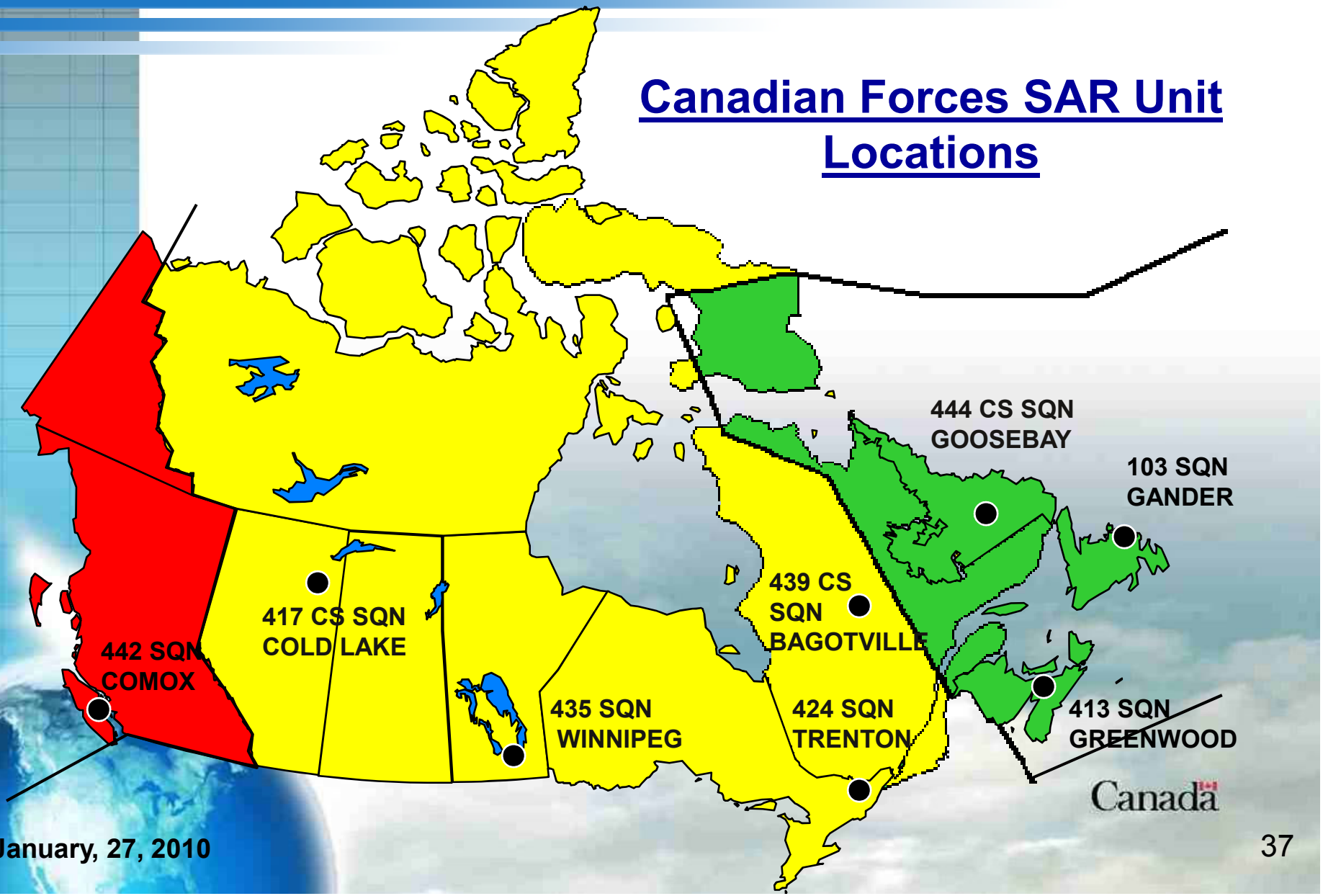
SAR Capabilities and Resources

Aircraft Direction Finding Equipment (Homing)

- CF SAR aircraft carry specialized radio equipment that will detect and effectively lead SAR crews to the exact location of the beacon emitting the distress signal.
- Aircraft, however, must first be within radio reception range.
- Distress beacons carried by Cougar Helicopters (both aircraft and personnel) are compatible with CF SAR aircraft detection and homing capabilities

SAR Capabilities and Resources

Canadian Forces SAR Unit Locations



SAR Capabilities and Resources

Primary Canadian Forces SAR Assets

COMOX, BC - 6 x CCII5 Buffalo
- 6 x CH149 Cormorant

WINNIPEG, MB - 5 x CC 130 Hercules

TRENTON, ON - 11x CC 130 Hercules
- 4 x CH 146 Griffon

GREENWOOD, NS - 4 x CH149 Cormorant
- 3 x CC 130 Hercules

GANDER, NL - 3 x CH149 Cormorant

1 of each aircraft type per base location dedicated to SAR response 24/7.

Canada

SAR Capabilities and Resources

Secondary Canadian Forces SAR Assets

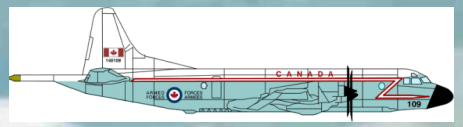
COLD LAKE, AB
BAGOTVILLE, QC
GOOSE BAY, NL
- CH 146 Griffon

SHEARWATER, NS - CH 124 Sea King

VICTORIA, BC - CH 124 Sea King

COMOX, BC - CP 140 Aurora

GREENWOOD, NS - CP 140 Aurora



+ ***Any*** CF aircraft or Navy vessel (as appropriate)

Canada

SAR Capabilities and Resources

Volunteer SAR Air Resource

- Civil Air Search and Rescue Association (CASARA)

  CASARA aircraft and crews are search/communications resources only

  - Cannot be tasked (volunteers) but are requested to undertake a tasking
  - No capacity to provide material aid to survivors (such as food/clothing/medical supplies)

SAR Capabilities and Resources

CC130 Hercules

Range: 7,222 km (4,488 statute miles)

Speed: 556 km/h (345 mph)

Crew: 7

SAR Configuration

- Air-droppable survival kits
- Air-droppable marine pump kits
- Air-droppable SAR Tech Toboggans
- Air-droppable sea rescue kits
- Food and water kits
- Flares for night illumination
- Smoke markers

Method of Insertion:

- **Parachute**

Method of extraction:

- **Helicopter or other means**

Radar: **Weather and minimal terrain mapping**

SAR Capabilities and Resources

CH149 Cormorant

Range: 1000+ km (688 statute miles)

Speed: 278 km /Hour (173 mph)

Crew: 5

Capacity:

- Standard SAR = 2 x stretchers + 4 seated
- Max Medevac = 12 stretchers
- Max Pax = 18 seated

Method of Insertion and Extraction:

- 2 co-located rescue hoists
- 600 lb capacity and 290' of cable

Radar: Weather Radar

Flight Capabilities:

- VFR / IFR / Night
- Into known icing conditions (moderate)
- 10,000' operational ceiling (non pressurized)

SAR Capabilities and Resources

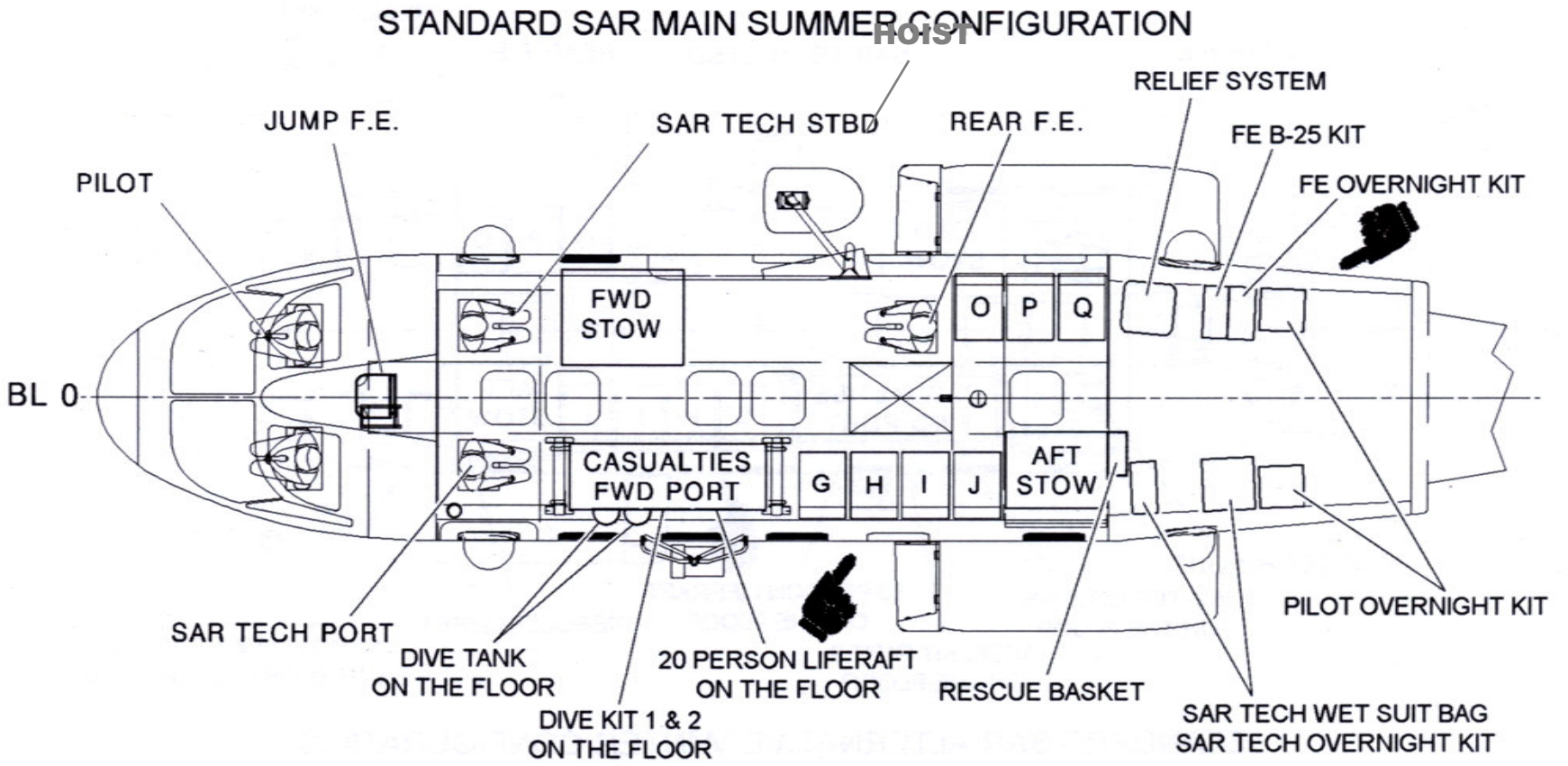
CF SAR Helicopter Replacement Program (Cormorant):

Auto-Hover Considered Essential:

- in low visibility and limited reference situations
  - Night and in obscuring phenomena (fog, recirculation of snow, dust, spray)
  - frequently encountered on overwater SAR missions
- provides stability over a geographic point in space above the earth's surface without the visual references normally required by the pilot to hover a helicopter
- crew focus is then on the precision of the helicopter location wrt the target location
  - The precise insertion point is sometimes only as large as few square feet that itself is subject to a very dynamic ocean environment.

SAR Capabilities and Resources

CH149 SAR Configuration



SAR Capabilities and Resources

SAR Crews

There are two vital components to a SAR Crew:

- **Search and Rescue Technicians:**
  - Primarily to operate from the aircraft (fixed wing and helicopters)
    - (5 year developmental process)
  - Perform some on aircraft duties related to SAR
    - Target spotting
    - Lookouts and Clearance calling on helicopters
- **The Remaining Aircraft Crew:**
  - Pilots (5 year process)
  - Flight Engineers (6 year process)
  - Navigators (Fixed Wing only) (3 year process)
  - Load Masters (Hercules only)
- Safe and effective operation of the aircraft
- Effectively deliver SAR Techs and equipment

SAR Capabilities and Resources

SAR Aircrew

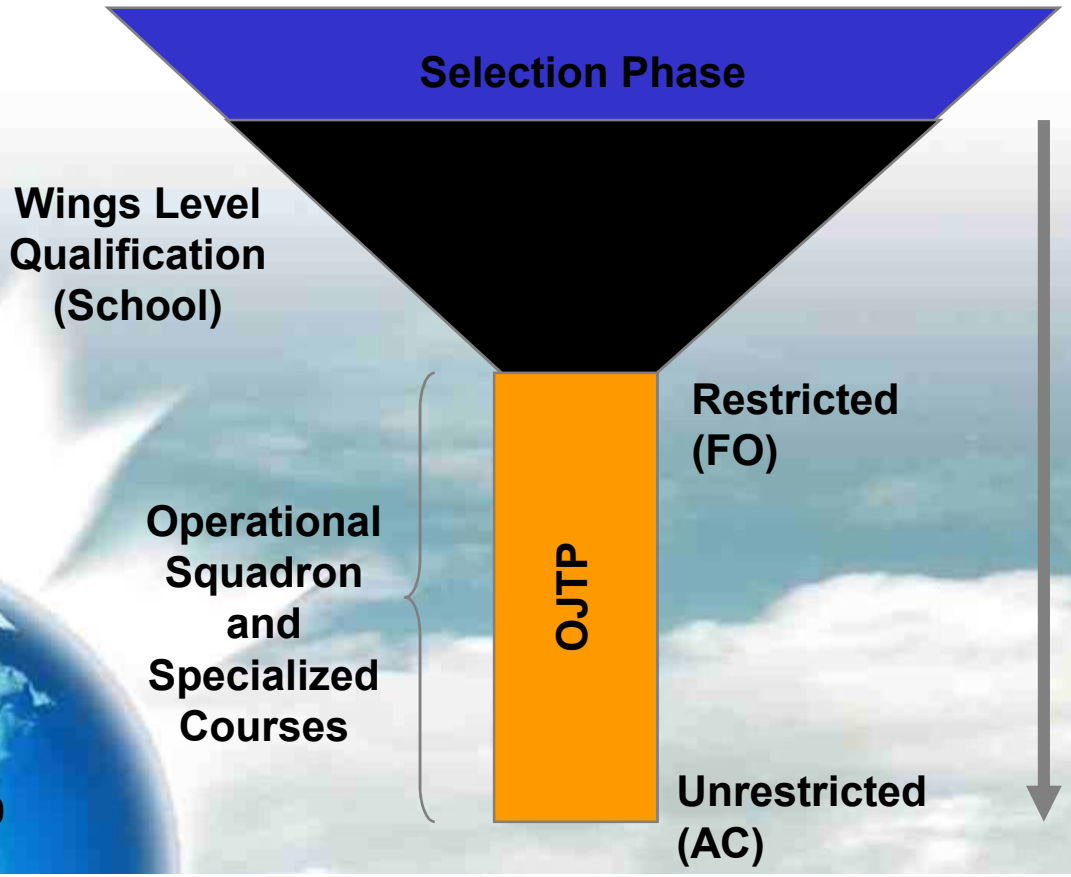
- **Responsible for the safe and effective operation of CF aircraft**
  - **The precise delivery of SAR Techs (the functional SAR component) as quickly and effectively as possible**
  - **Sufficiently and competently trained in specific roles:**
    - **2 Pilots (Helicopter and Fixed Wing) (2)**
    - **1 Flight Engineer (Helicopter and Fixed Wing)**
    - **1 Navigator (Fixed Wing only)**
    - **1 Load Master (CC130 Hercules only)**

SAR Capabilities and Resources

SAR Aircrew Development

Pool of Candidates:

- **Direct Recruitment and Occupational Transfer from within the CF (1-4 years)**



SAR Capabilities and Resources

CH 149 Pilot SAR AC

- Initial Officer Training (1-4 years)
- Basic Plt Course (1 year)
  - Three Phases to Wings Graduation
- Operational Training (3-12 months)
  - Specific aircraft type and role
  - Initial operational qualification (First Officer)
- On-Job-Training
  - Progressive training to Aircraft Commander (24 months)

SAR Capabilities and Resources

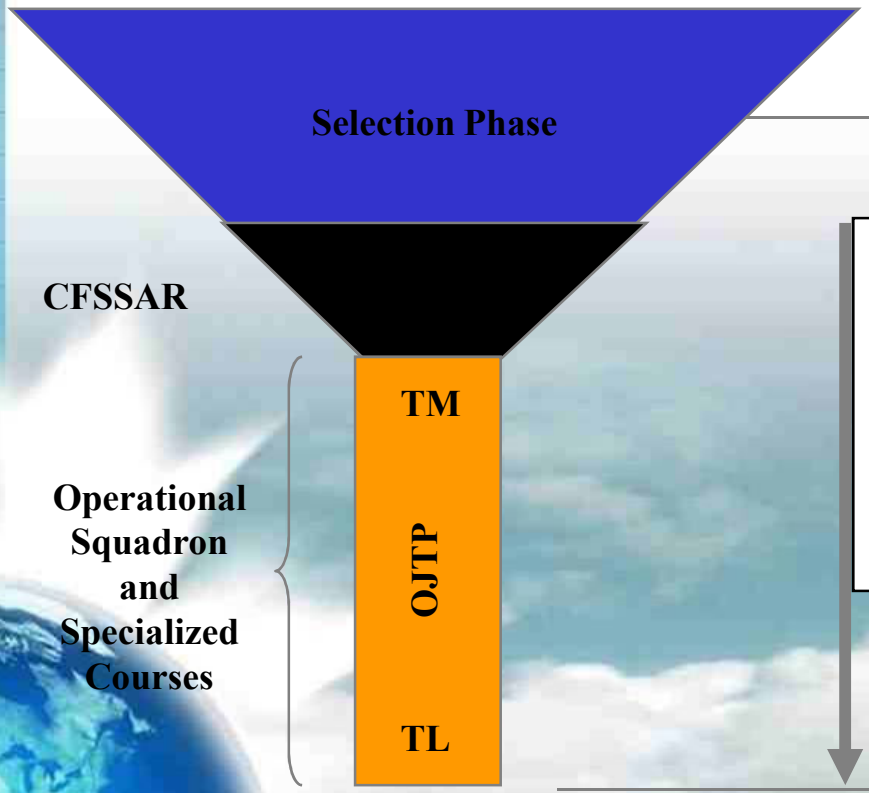
Search and Rescue Technician (SAR Tech)

- The functional component of the CF that is sufficiently trained and equipped to deploy from CF aircraft and as an independent team administer assistance to those involved in a distress situation to the point when they are handed over to proper medical authorities
  - High degree of medical training and competency
  - Versed in aircraft based operations and the techniques used to penetrate distress sites from those aircraft in most terrains and environments
  - Versed in independent survival in all conditions
- CF SAR response would be nothing without SAR Technicians

SAR Capabilities and Resources

SAR Tech Training

Pool of Candidates:
- **Existing CF Members**
- **Direct Recruitment**



From selection to:
- **Functional Team Member (TM) in 18 months**
- **Operational Team Leader (TL) in 5 years**

SAR Capabilities and Resources

Canadian Forces School of Search and Rescue

Consists of:

- School (Comox)
- Sea Survival School (Comox)
- Jarvis Lake (AB)
- Resolute Bay (NU)

Canada

SAR Capabilities and Resources

The Basic SAR Tech Crse

- 11 month Basic SAR Tech Course
  - Winter, Ground, Arctic Operations/Survival
  - Medical (Primary Care Paramedic) JIBC/CF
  - Parachute Operations (Static line / Freefall)
  - Helicopter Operations
  - Sea Survival
  - Diving (CABA/AGA) Operations
  - OTV (Over Turned Vessel Extrication)
  - Mountain Operations
  - (Tech. Rock, Snow & Ice)
  - Operational Evaluation Phase

SAR Capabilities and Resources

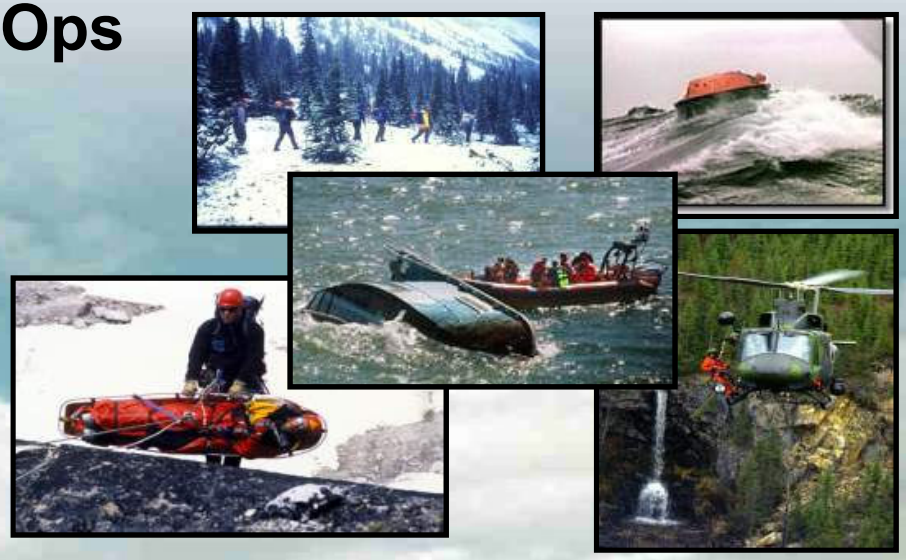
SAR Tech Capabilities

- Operate from fixed & rotary winged SAR aircraft
- Render on-site life-saving & sustaining medical care within established medical protocols

SAR Capabilities and Resources

SAR Tech Capabilities

- **Penetrate distress scenes in terrestrial or maritime environments**
  - **Parachute and Hoist**
- **Water rescue ops utilizing (CABA / AGA)**
- **Organize and lead ground search teams**
- **Mountain rescue Ops**



SAR Capabilities and Resources

SAR Tech Capabilities

- Prepare, Extract & Evacuate casualties by means of air, land or sea
- Continue life-sustaining medical care during a medical evacuation to an appropriate medical facility

SAR Capabilities and Resources

SAR Tech Capabilities

- Conduct survival procedures under all climatic and terrain conditions
- Communicate by use of radios, pyrotechnic, ground and hand signaling devices

Canada

SAR Capabilities and Resources

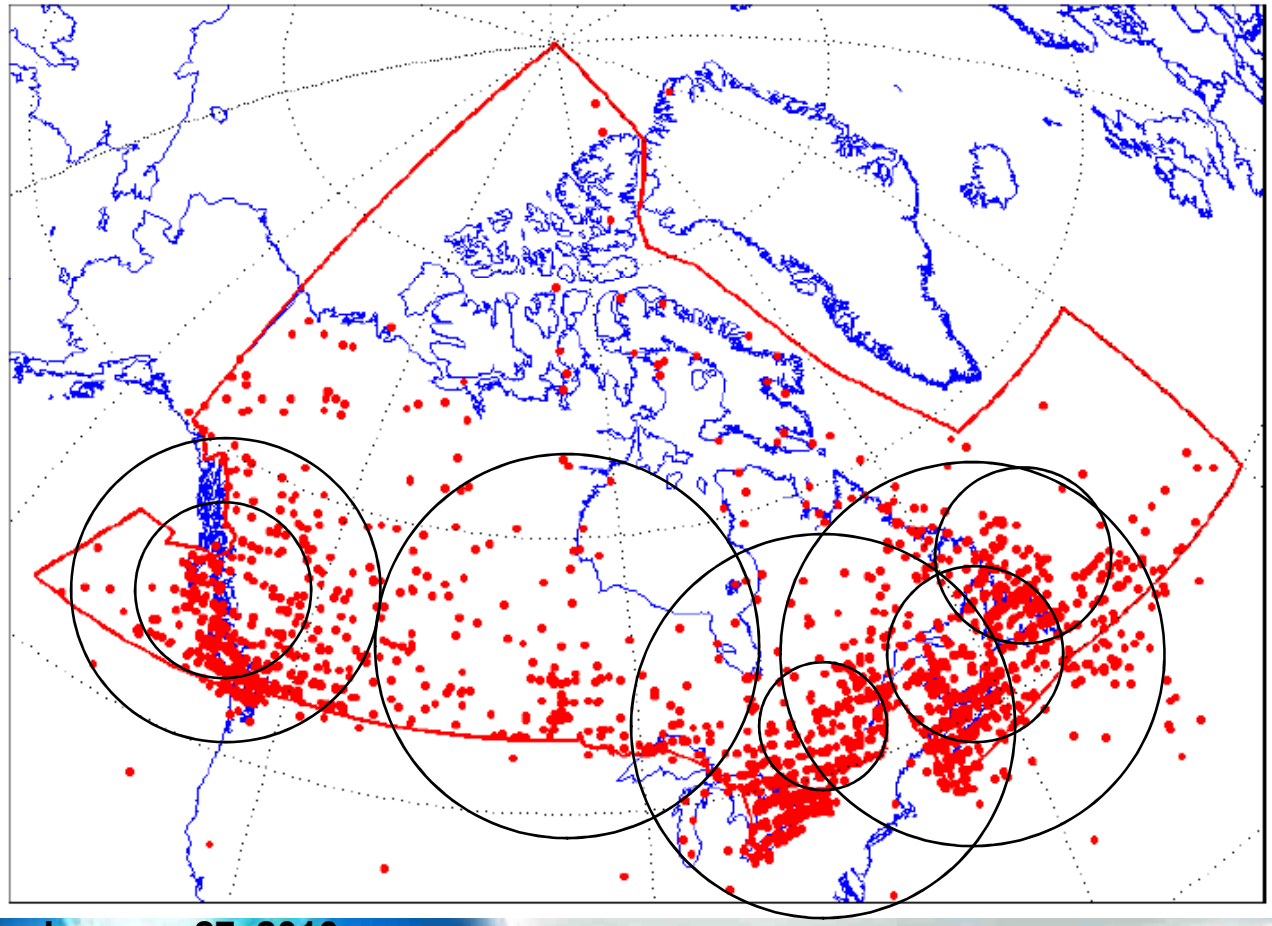
SAR Tech Capabilities

- Operate vehicles including Snowmobile, ATV and marine craft
- Manage SAR Tech resources

Operations

Canadian SAR Area of Responsibility *Incident Distribution*

Canadian Forces SAR Incident Response (1998-2001)

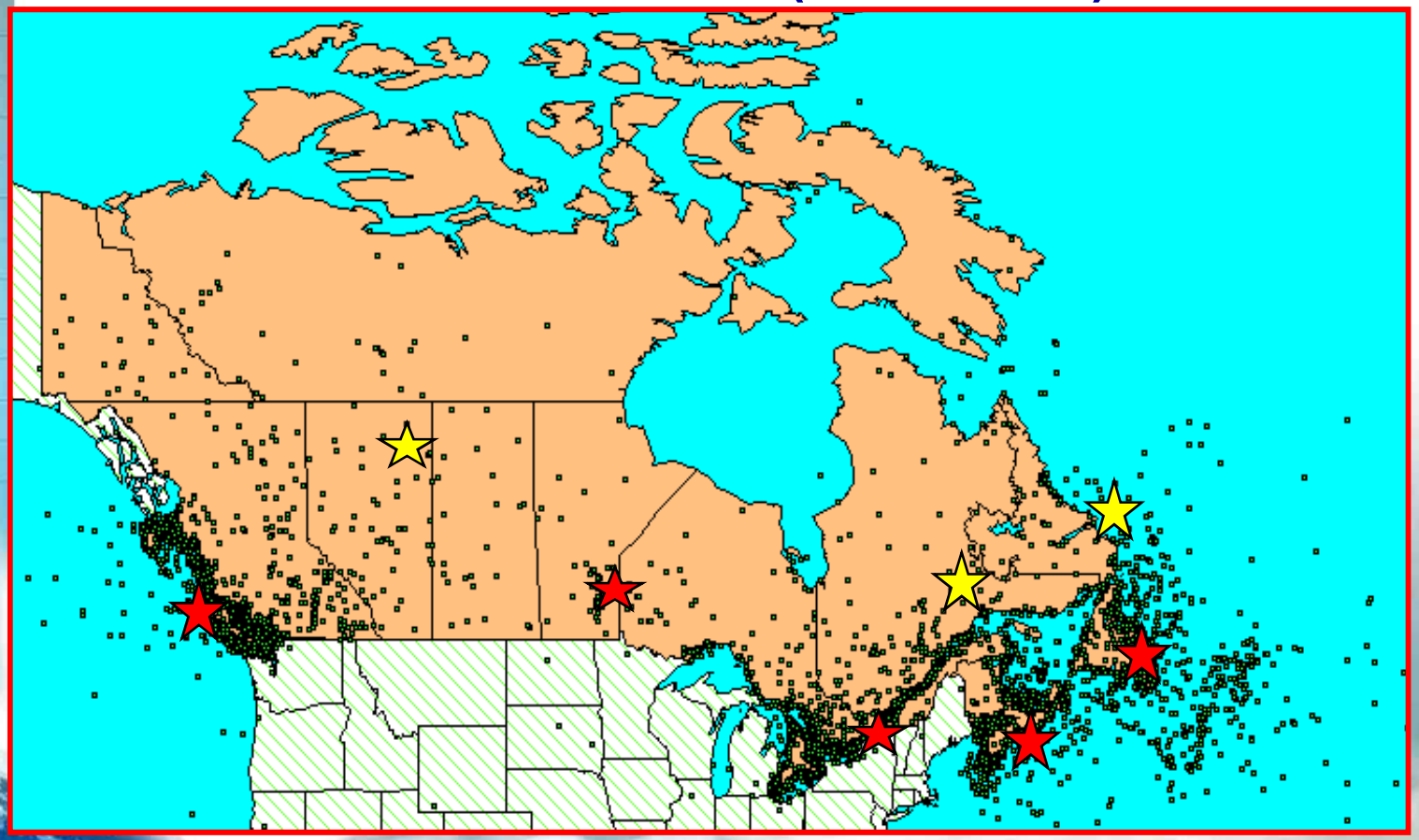


- **Distress patterns are consistent with the distribution of population.**
- **Majority of incidents are marine in nature.**
- **Federal Resources: Positioned to provide the greatest amount of good in the least amount of time.**

Canada

Operations

Incident Distribution (1995-1999)



★ *Primary SAR Squadrons* ★ *Secondary SAR Squadrons*

Canada

Operations

SAR Incident Classification

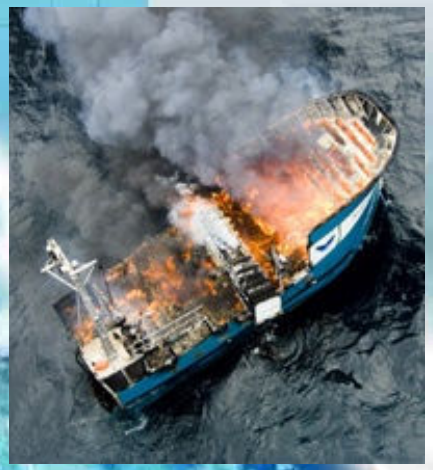
- BGA 209 National SAR Manual Definitions:
  - Aeronautical
  - Marine
  - Humanitarian

Operations

- Aeronautical Incident
  - A search and rescue incident involving an aircraft on land

Operations

- Maritime Incident
  - A search and rescue incident on the water involving a vessel or person(s) from a vessel, including the medical evacuation of a person(s) from a vessel
  - An aircraft in the water is treated as a maritime incident



Canada

Operations

- Humanitarian Assistance
  - A SAR incident (not Aeronautical or Maritime) that requires a CF SAR response in order to preserve life or relieve human suffering
    - Effectively, any incident that doesn't involve a plane or a boat on either the Ocean or Great Lakes
  - Provincial jurisdiction coordinated through the EMO or local police force (RCMP, RNC, OPP, QPP)
    - Missing hunters , snowmobilers, adventurers, etc

Operations

Statistics



YEAR END TOTAL NUMBER OF RECORDED INCIDENTS						
	2004	2005	2006	2007	2008	
HALIFAX SRR	1940	1958	2446	2723	2673	
TRENTON SRR	2574	3067	3108	3483	3278	
VICTORIA SRR	3012	2961	3007	3060	3146	
						5yr Avg
TOTAL	7526	7986	8561	9266	9097	**8487**

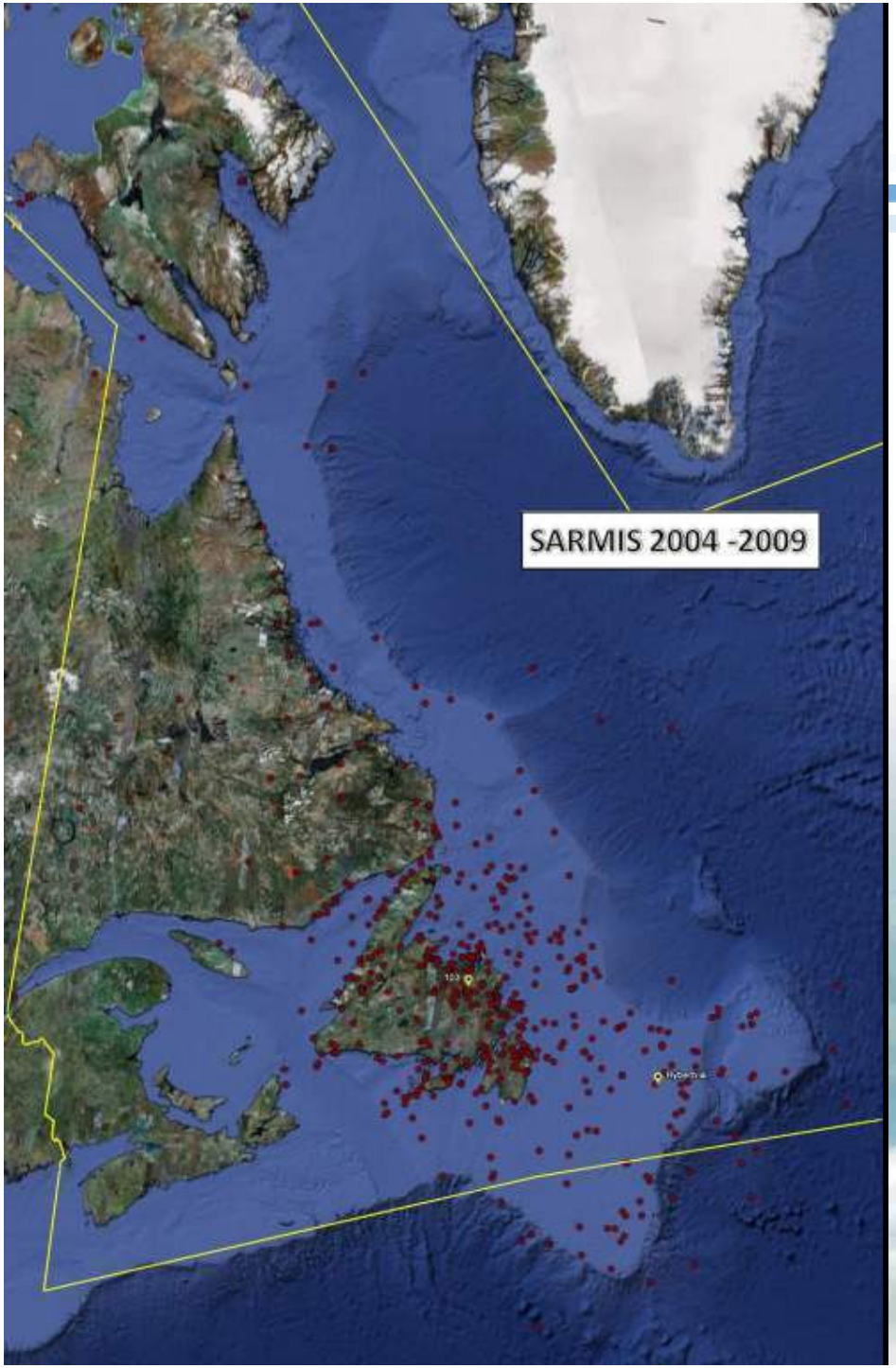
Canada

Operations

SAR Incident Distribution 2008

	Federal Response to:			
SRR	Total	Aeronautical	Maritime	Humanitarian
Halifax	2673	191	1752	730
Trenton	3278	535	2034	709
Victoria	3146	274	2174	698

Operations

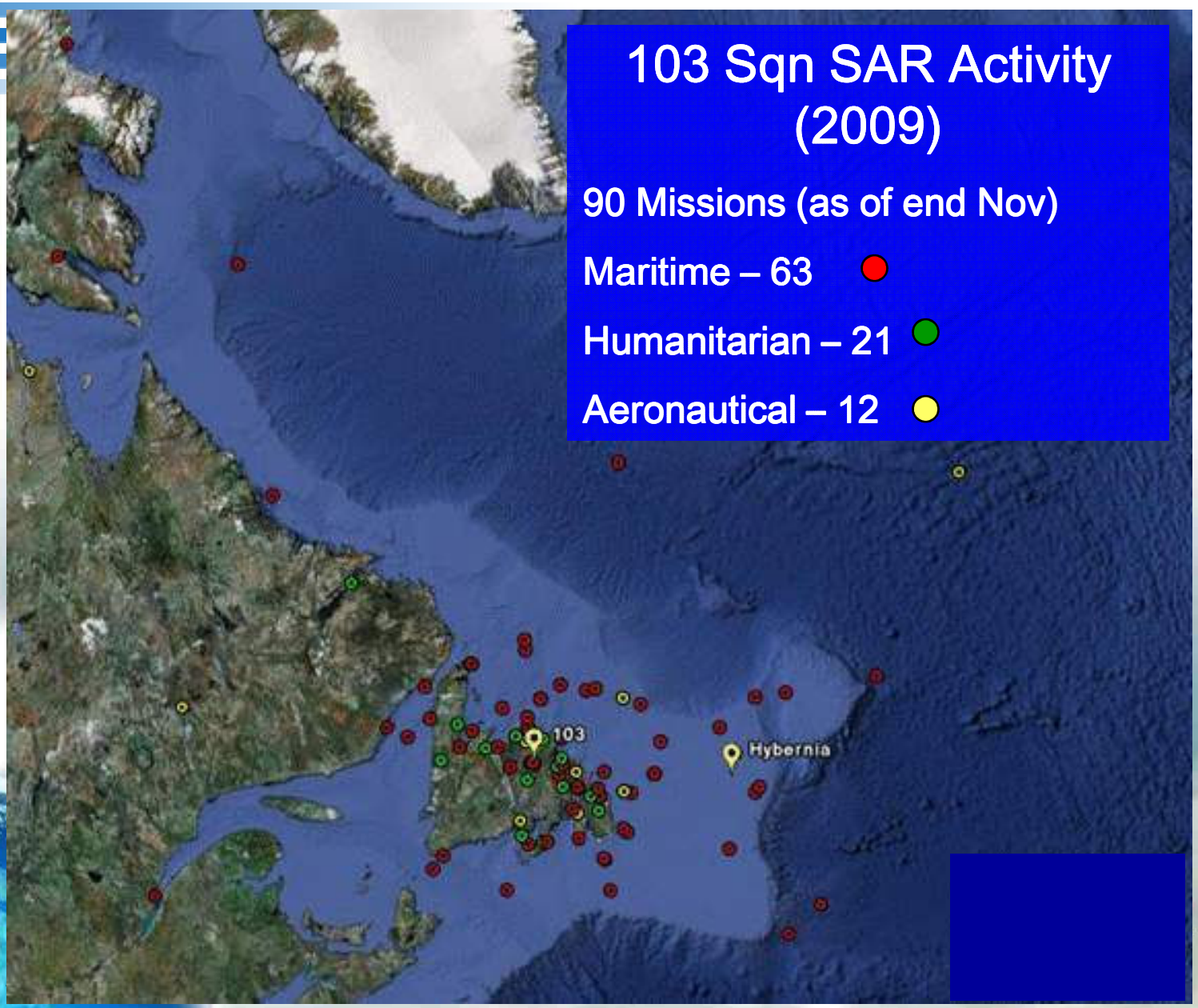


Incident Distribution

Locations to which 103 Sqn delivered a response from 2004 to 2009.

Canada

Operations


103 Sqn SAR Activity (2009)
90 Missions (as of end Nov)
Maritime – 63
Humanitarian – 21
Aeronautical – 12
103
Hybernia

UNCLAS

Halifax SRR
CF Primary SAR
Asset Location

24/7 SAR Standby

1 x CH149 Helo (Gander)

1 x CH149 Helo (Greenwood)

1 x CC130 Hercules (Greenwood)

Notification to Airborne in:

- 25 min @ 30min RP
- 70 min @ 2hr RP

CYYR

CYAY

103 Sqn

CYYT

Oil Fields

Cape Race

LFVP

413 Sqn

Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image IBCAO
Image © 2009 TerraMetrics
Image USDA Farm Service Agency
Streaming 100%

Pointer 51°33'56.15" N 60°41'29.24" W

January, 27, 2010

Halifax SRR
CF Secondary
Air Asset Locations

No National SAR Standby Posture

All CF assets are subject to tasking in support of national SAR requirements.

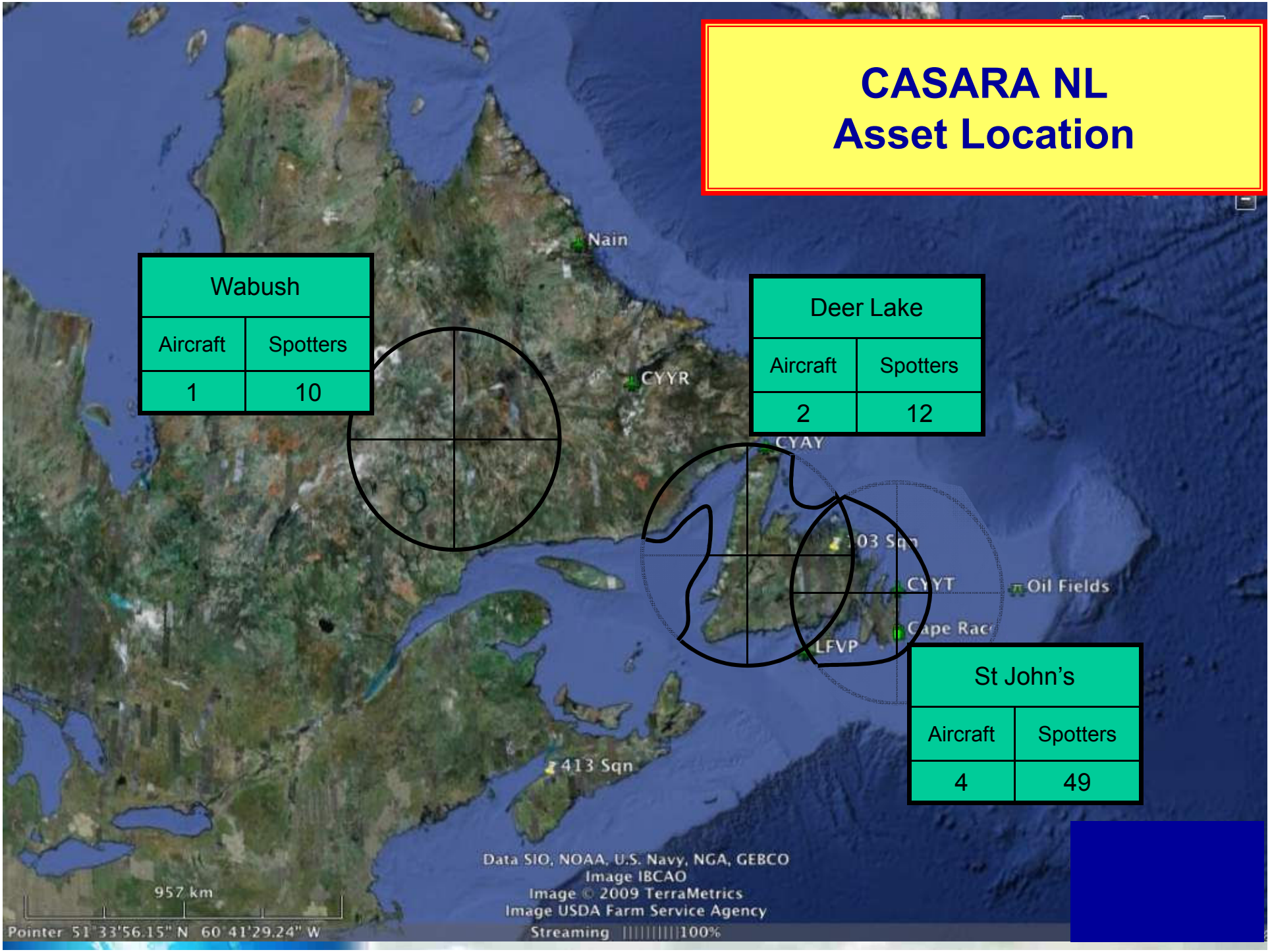
When required to backfill or augment Primary SAR assets the most commonly used (East Coast) resources are:

- CH146 Griffon (Helo)
- CH124 Sea King (Helo)
- CP140 Aurora (FW)

Nain
CYYR
CYAY
103 Sqn
CYYT
Oil Fields
Cape Race
LFVP
413 Sqn
Data SIO, NOAA, U.S.
Image © 2009 TerraMetrics
Image USDA Farm Service Agency
Streaming 100%
Pointer 51°33'56.15" N 60°41'29.24" W

January, 27, 2010

CASARA NL
Asset Location



Wabush	
Aircraft	Spotters
1	10

Deer Lake	
Aircraft	Spotters
2	12

St John's	
Aircraft	Spotters
4	49

Newfoundland/Labrador/adjacent Commercial Resources Known to JRCC

Kenn Borek Air

Universal Helicopters

Canadian Helicopters

Provincial Airlines (PAL)

Cougar Helicopters

Nain

CYYR

CYAY

103 Sqn

CYYT

Oil Fields

Cape Race

LFVP

413 Sqn

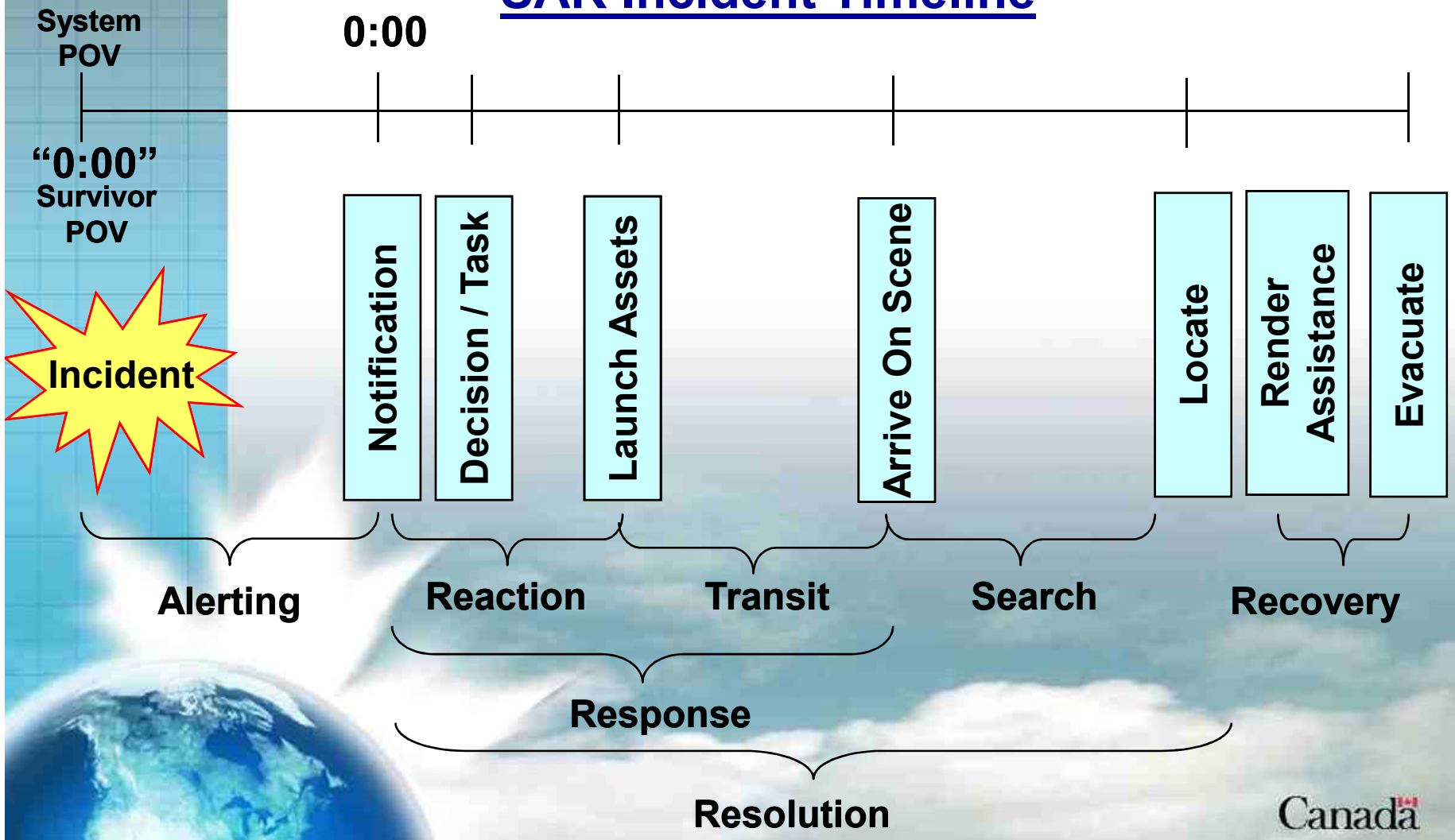
Data SIO, NOAA, U.S. Navy, NGA, GE
Image IBCAO
Image © 2009 TerraMetrics
Image USDA Farm Service Agency
Streaming 100%

957 km

Pointer 51°33'56.15" N 60°41'29.24" W

Operations

SAR Incident Timeline



Operations

Reports and Returns

- SAR Log and Case File (JRCC)
- Daily Situation Reports on individual cases (JRCC & Search Master)
- Missing Aircraft Notifications (Flight Service Stations)
- Briefing / tasking forms (JRCC)
- SAR Mission reports (CF Sqn and CCG Ships)
- Daily SAR Summary of all cases (JRCC)

Operations

SAR Operations (SAR Ops) Reports

- Purpose
  - Records the pertinent details of an incident for the information of participating SAR agencies, other agencies and owners/operators of the aircraft or vessel
- Criteria
  - Major SAR Op
  - To make recommendations or comments on the command, control and/or co-ordination aspects of the incident.

Operations

SAR Squadron Rhythm

- **Always a crew on SAR duty and always a crew awaiting to take over SAR duty.**
  - **Upon Notification**
    - Crews resting home are considered “fresh” and can be expected to deliver 15 to 18 hours of service
    - Crews on 30 minute response are only as “fresh” as the beginning of their shift (@ 0800)
      - Shifts are 8 hrs long, so a crew may only have 7-10 hours of useful service left upon notification.
      - Long range missions may require the early activation of the “freshest” crew because of the expected mission duration.
  - **Assess the requirement and implications of crew replacement**
  - **Training and Helicopter Maintenance are critical and ongoing activities that ensure the generation of SAR sufficient and capable SAR response Forces**

Operations

The Anatomy of a SAR Response

- **Notification**
  - Gather mission details (location / situation) from JRCC
    - Details are often very limited to begin with and over the course of the mission are updated based on JRCC investigation
    - Search requirements?
      - How much detail is known about the location (precise or general)
    - Rescue requirements?
      - Number of people involved
      - Any idea about their ability to sustain themselves?
        - Initial condition (trauma)
        - Survival equipment
      - Nearby vessels or resources
    - Identify a location of Safety….where do we take them?

Operations

The Anatomy of a SAR Response

- **Environmental Analysis** (Weather and Navigation Aids)
  - (VFR / IFR / combination)
    - Departure aerodrome
    - En route
    - At the distress location (assess the difficulty visually acquiring the distress site)
      - Over land
        - ✓ Closest suitable airport with an instrument approach
        - ✓ Closest suitable shoreline for a self directed radar approach
        - ✓ Suitable weather to proceed visually
      - Over water
        - ✓ Self directed radar approach
    - Influence on re-fueling options
    - Destination
    - Alternate aerodrome requirements to ensure a safe landing before fuel exhaustion (required for departures and arrivals)

Operations

The Anatomy of a SAR Response

- **Develop Plan**
  - Special equipment considerations
  - Route study and assessment
  - Sufficiency of initial fuel load
    - Maximize the amount of time available for the provision of on scene assistance prior to commencing evacuation
    - En-route re-fueling
  - Blue Forces (other assets providing assistance)
  - File the Flight Plan (normally ATC requires 30 minutes notice)
- **Don Appropriate Gear**
  - Immersion suits
  - NVGs (adjusted to each individual immediately prior to flight)
- **Launch**
  - As quickly as possible
    - 20 minutes during 30 min RP
    - 65 minutes during 2 rh RP

Operations

The Anatomy of a SAR Response

- **Execute the Plan**

➢ En Route
  - ➢ Maintain situational awareness with JRCC
  - ➢ Continually monitor and update the plan according to updates and "progress"
    - ➢ actual weather versus expected conditions
      - winds affect ground speed
      - Icing conditions
      - Improving or deteriorating weather
        - ✓ Offshore forecasting is only "so" accurate
        - ✓ A lot can change in the 5-8 hours that it takes to fully execute a mission
  - ➢ Rendevez-vous with Top Cover
  - ➢ Prepare to Arrive On-Scene
    - ➢ SAR Techs dressed and equipment prepared for deployment
    - ➢ Fully brief the expected chain of events
      - Means of arrival (visual or on instruments…contingencies if things do not unfold as planned)
    - ➢ All that training "kicks-in"

Operations

The Anatomy of a SAR Response

- **Execute the Plan**
- On-Scene
  - Visually acquire the target
    - Day = normal visual cueing
    - Night = assisted by Night Vision Goggles
      - NVGs
        - ✓ enhances visible light, but does not turn night into day.
        - ✓ Very effective in detecting light sources, particularly those that are not natural to the environment, which is usually a great indication of the presence of "man", whether it be fires or lights.
  - Maneuver the helicopter for optimal insertion of SAR Techs, without exacerbating the distress situation by the helicopter's rotor wash
  - Insertion of SAR Tech Team
    - Normally via hoist
    - Landing is an option when conditions permit
  - Conserve fuel with the intent of providing maximum amount of time on scene
  - Confirm weather conditions for return leg
  - SAR Tech Team stabilizes the situation and prepared survivors for extraction

Operations

The Anatomy of a SAR Response

- **Execute the Plan**
  - On-Scene
    - SAR Tech Team stabilizes the situation and prepared survivors for extraction
      - Further penetration may be required
        - Overturned vessel
        - Other location on larger ships (below decks)
        - Plane wreckage
        - Vertical rescue from mountain slopes
      - Medical protocols to treat urgent conditions
      - Package immobile cases
      - Communicate the extraction strategy to the helicopter
    - Extract the Team and survivors
    - Depart the scene
- Recovery to Safety as quickly as possible
  - Sustain survivors, and continue to their assess conditions
  - Re-assess suitability of the point of arrival and ETA
    - Will conditions permit hospital direct?
  - Hand-over to appropriate authorities

Operations

The Anatomy of a SAR Response

- **Mission Complete**
- **Reconstitution**
  - **Crew readies the helicopter and equipment for continuity of SAR service**
  - **Preparations are made to return to the Main Base of Operations**
  - **The Squadron will have considered and anticipated the state of the crew at the conclusion of the mission, and when appropriate they will activate a replacement crew, pending the availability of all of the necessary components:**
    - **Squadrons are established with personnel and equipment such that they can sustain a continuous ability to respond with no less than one dedicated SAR resource:**
      - **Crew availability (replacement crew)**
      - **Helicopter availability (more than one available airframe)**
      - **Equipment availability (sufficient stores and equipment)**

Conclusion

Beyond preventing distress incidents from occurring…..

Success in SAR is the delivery of a response appropriate to the needs of those in distress, who, having made reasonable effort to outlast their conditions find themselves in a situation that permits rescue.

- **Key Requirements**
  - **A *Responsible* and *Prepared* Public**
  - **Sufficient/capable resources (public/private/commercial)**

***The Challenge*: To strike a proper balance that favours survival while economizing effort and limiting costs.**

- Questions?