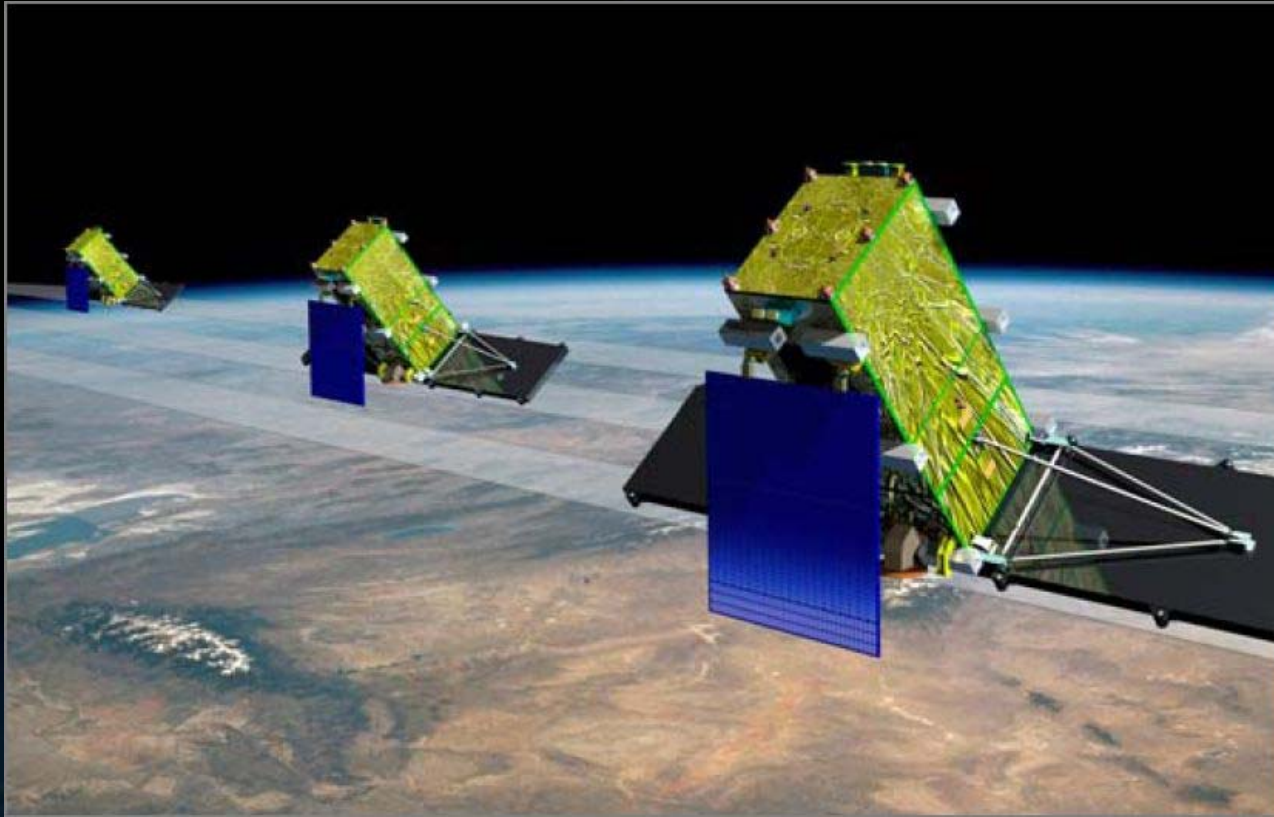


RADARSAT CONSTELLATION MISSION

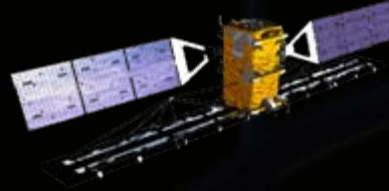
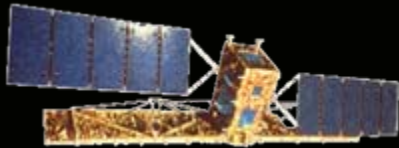


Phase D Update

Synthetic Aperture Radar Earth Observation for Canada



RADARSAT Program Evolution



1995: RADARSAT-1

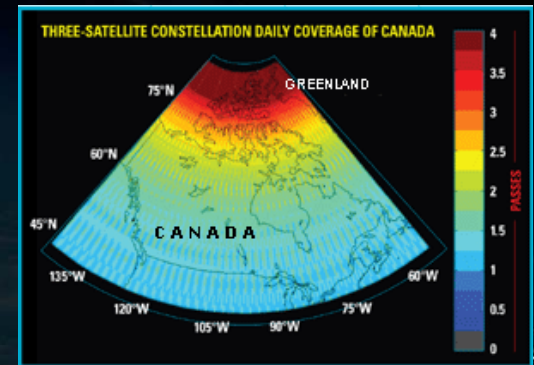
2007: RADARSAT-2

2018: RCM

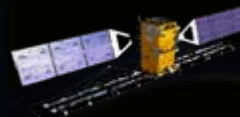
- First operational civilian SAR satellite
- Important R&D component
- GoC owned

- Ops extended to DND, DFO, NRCan, and EC
- Numerous sci & ops modes
- MDA owned (PPP)

- Fully operational
- Selected R2, Compact Pol. Coherent Change Detection
- Enhanced ship detection
- GoC owned
- Fast tasking, fast delivery



RADARSAT Satellites Comparison



RADARSAT-1

RADARSAT-2

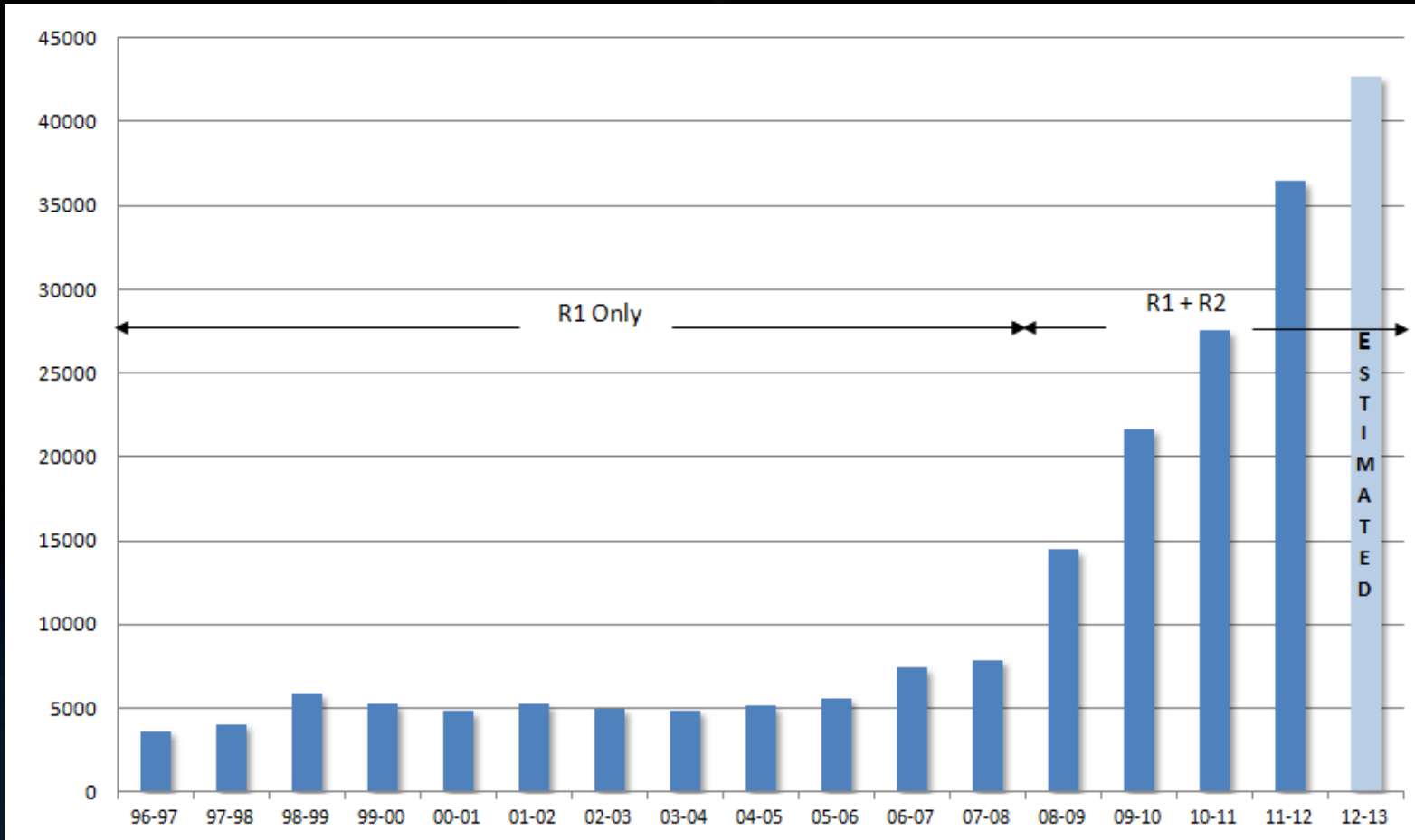
RCM

- Mass** • 2750 kg
- Complete Coverage** • 2-3 days
- Exact Revisit** • 24 days
- Imaging time /orbit** • 28 min
- antenna span** • 15 m
- Polarization** • Single HH
- Altitude** • 800 km

- 2280 Kg
- 2-3 days
- 24 days
- 28 min
- 15 m
- Single, Dual, Polarimetric
- 800 km

- 1430 Kg
- Daily coverage
- 4 days (12/sat)
- 15 min /sat
- 6.75 m
- Single, Dual, Compact Pol
- 600 km

Usage of RADARSAT Data by the Gov't



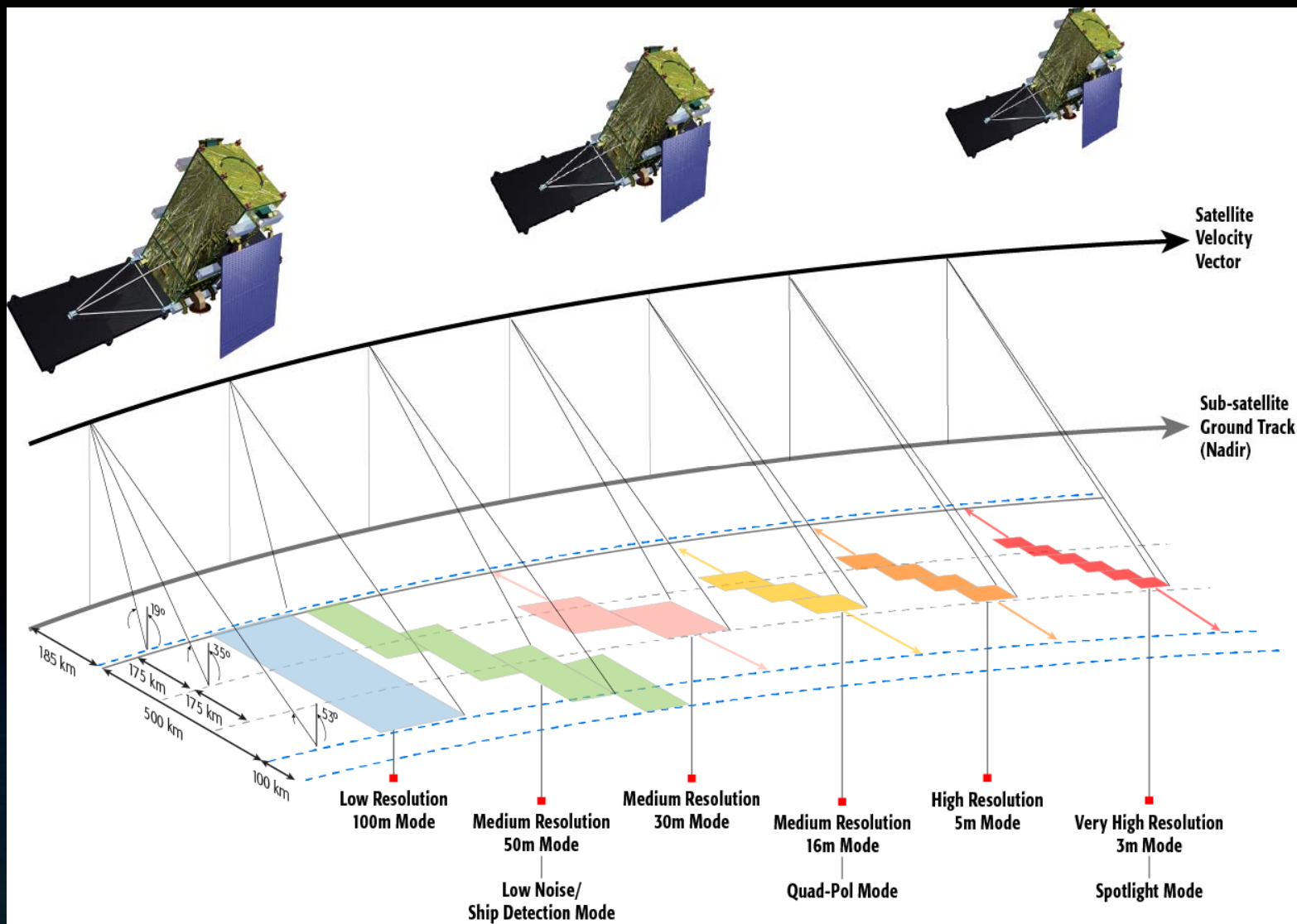
RCM Objectives



- **System of 3 small satellites designed to:**
 - Support the operational requirements of Federal departments ensuring continued access to critical RADARSAT data
 - Provide daily coverage over Canada and our maritime approaches
 - Provide improved and faster access to anywhere on the globe
- **RCM addresses Federal departments mandates and Government priorities in the following areas:**
 - *Maritime Surveillance*
 - *Disaster Management*
 - *Natural Resources Management*
 - *Northern Development*



RCM Imaging Modes





Current imaging offer

Mode	Nom. Res.	Num Looks	Nominal Swath Width (accessible)	Min Along Track Length	Nominal NESZ	Polarization Options							Quad Pol	Swath Width for Dual Pol non-real time downlink	
						Single Pol				Dual Pol					Compact
						HH	VV	HV	VH	HH+HV	VV+VH	HH+VV			
Low Resolution 100m	100	8x1	500 (500)	10	-22	✓	✓	✓	✓	✓	✓	✓	✓	500 (4-bit)	
Medium Resolution 50m	50	4x1	350 (500)	10	-22	✓	✓	✓	✓	✓	✓	✓	✓	350 (4-bit)	
Medium Resolution 16m	16	1x4	30 (350)	10	-25	✓	✓	✓	✓	✓	✓	✓	✓	30 (4-bit)	
Medium Resolution 30m	30	2x2	125 (350)	10	-24	✓	✓	✓	✓	✓	✓	✓	✓	125 (4-bit)	
High Resolution 5m	5	1	30 (500)	10	-19	✓	✓	✓	✓	✓	✓	✓	✓	22 (3-bit)	
Very High Resolution 3m	3 @35°	1	20 (500)	10	-17	✓	✓	✓	✓	✓	✓	✓	✓	18 (2-bit)	
Low Noise	100	4x2	350 (500)	10	-25	✓	✓	✓	✓	✓	✓	✓	✓	12 (3-bit)	
Ship Detection	var.	var.	350 (600)	10	var.	✓	✓	✓	✓	✓	✓	✓	✓	350 (3-bit)	
Quad-Polarization	9	TBD	> 20 (250)	10	-24								✓	20 (3-bit)	
Spotlight	1 (az) x 3 (grd) @35°	1	20 (350)	5	-17	✓	✓	✓	✓	✓	✓	✓	✓	18 (2-bit)	
														12 (3-bit)	

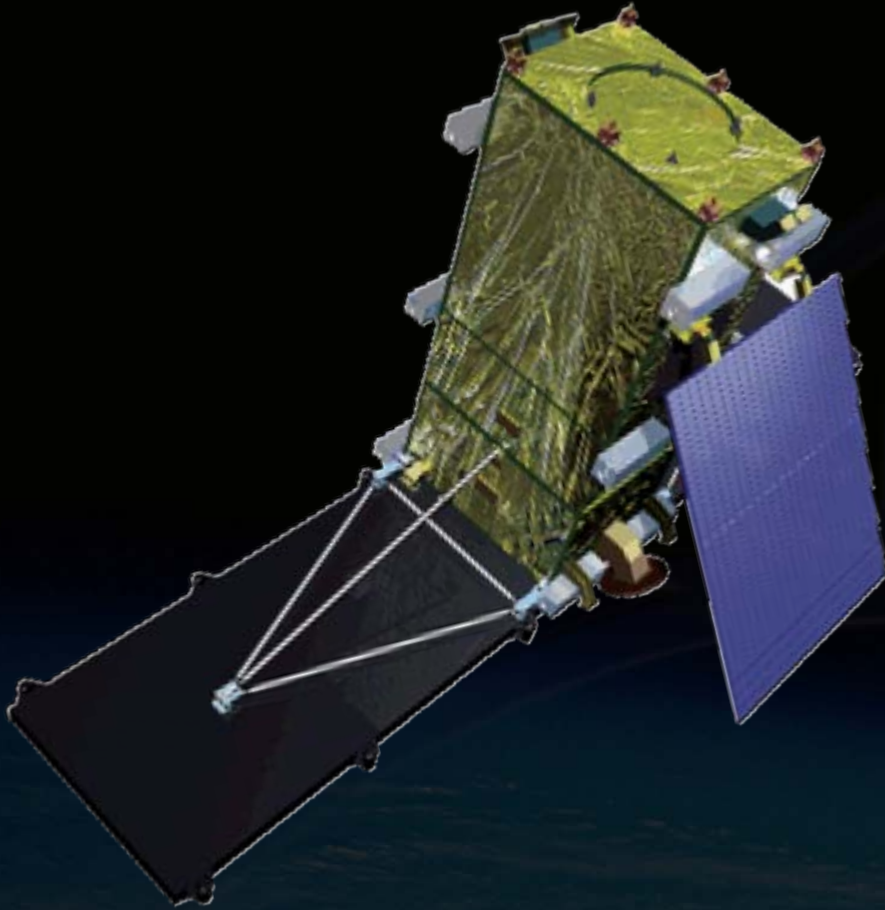
AIS Status

- AIS now fully integrated in the baseline
- AIS PDR (Phase B) completed in Jan 12, with closeout in Aug 12
- AIS Phase C planned to start Feb/Mar 13
- AIS CDR planned for Jan 14
- Expected to catch up with rest of sub-systems
- Part of RCM Phase D contract with MDA, but DND funded
- DND provides one project manager

Phases D & E1



Space Segment Baseline



Company	Role
MDA Richmond	Prime Contractor
MDA Montreal	Integrated Payload and Spacecraft AIT
COMDEV UK	AIS Payload
Bristol	Spacecraft Bus
Astrium	Crypto Units
MDA EO Systems	Ground Segment
SpaceX	Launch



Launch Vehicle

- All three spacecraft will be launched aboard a single Falcon 9 launch vehicle
- A launch slot has been reserved for a July 2018 launch from Vandenberg AFB
- The engineering services tasks were kicked-off in January 2012
- The next milestone is the start of the design of the spacecraft dispenser
- The latest Falcon flight was on October 7, 2012, an ISS re-supply mission that included the Dragon capsule
- Falcon 9 flight No 7 is planned to carry CASSIOPE later in 2013



Falcon 9 flight #2

Ground Segment Baseline (OGD's Role)

- **NRCan/CCRS**: Develop and manage long term archiving, cataloguing and data access for RCM unclassified data through CCRS' EODMS as well as antenna stations for satellite control and data reception in Prince-Albert (SK), Gatineau (Qc) and Inuvik (NWT);
- **DND**: Upgrade the Polar Epsilon stations in Masstown & Aldergrove in order to be able to use RCM SAR & AIS data;
 - The Polar Epsilon stations will be primarily use for RCM data reception, AIS data processing, and exploitation in the context of their Polar Epsilon 2 (PE2).
 - Data will be made available to other government users as necessary.

Ground Segment Baseline (GFEs & GFFS)

