



SOUTHERN GULF OF ST. LAWRENCE (CFA 12, 12E, 12F, 19) SNOW CRAB (*CHIONOECETES OPILIO*) STOCK ASSESSMENT IN 2025

CONTEXT

The Fisheries and Harbour Management Branch of Fisheries and Oceans (DFO) has requested an assessment of the southern Gulf of St. Lawrence (sGSL) snow crab (*Chionoecetes opilio*) stock for Crab Fishing Areas (CFAs) 12, 12E, 12F and 19. This Fisheries Science Advisory Report is from the regional peer review of January 28, 2026 on the Southern Gulf of St. Lawrence (CFAs 12, 12E, 12F, 19) Snow Crab (*Chionoecetes opilio*) Stock Assessment in 2025. Additional publications from this meeting will be posted on the [Fisheries and Oceans Canada \(DFO\) Science Advisory Schedule](#) as they become available.

SCIENCE ADVICE

Status

- The 2025 sGSL snow crab commercial stock biomass, estimated at 46,720 tonnes (t), is above the Upper Stock Reference (USR), placing the stock in the Healthy Zone of the Precautionary Approach (PA) Framework.

Trends

- Snow crab stock is currently at a low point in its population cycle.
- The commercial biomass index has been decreasing for the past three years, down 45% from 2022, 31% from 2023 and 10% from 2024.
- Fishery pre-recruits (> 56 mm carapace width) are currently at average or below average levels.
- Female spawning stock abundance is currently below average, due to very low levels of incoming new mature females.
- The population recruitment index is currently below average.

Ecosystem and Climate Change Considerations

- The area of suitable snow crab habitat rose in 2025 and is above the long-term average.
- Water temperatures within the snow crab habitat are warmer than average, which may impact the snow crab population dynamics and distribution.

Stock Advice

- Based on the harvest decision rule, the 2025 commercial biomass index corresponds to a target exploitation rate of 34.82% and a catch option of 16,268 t for the 2026 fishery in the sGSL.

- A risk analysis indicates that for this catch option, there is a low likelihood (16.7%) that the commercial stock would be below the upper stock reference and therefore in the cautious zone of the PA after the 2026 fishery.

BASIS FOR ASSESSMENT

Assessment Details

Year Assessment Approach was Approved

November 21-25, 2011 (DFO 2012)

Assessment Type

Full peer-reviewed stock assessment

Most Recent Assessment Date

1. Last Full Assessment: January 22-23, 2025 (DFO 2025)

Stock Assessment Approach

1. Broad category: Index-based (trends in empirical indices only).
2. Specific category: Index-based (fishery-independent).

Stock, Ecosystem and Fishery Overview Information

The sGSL snow crab stock details are in Surette and Chassé (2025), ecosystem conditions in Galbraith et al. (2025), and the 2024 fishery review in Harbicht et al. (2025).

Stock Structure Assumption

The snow crab stock in the sGSL is considered as a single biological unit. The snow crab trawl survey covers the majority of crab habitat in the sGSL.

Reference Points

One Limit Reference Point (LRP) and one USR point were developed for the sGSL snow crab stock.

- Limit Reference Point (LRP): 10,000 t of residual crab biomass.
- Upper Stock Reference (USR): 41,400 t of total commercial crab biomass.

Harvest Decision Rule

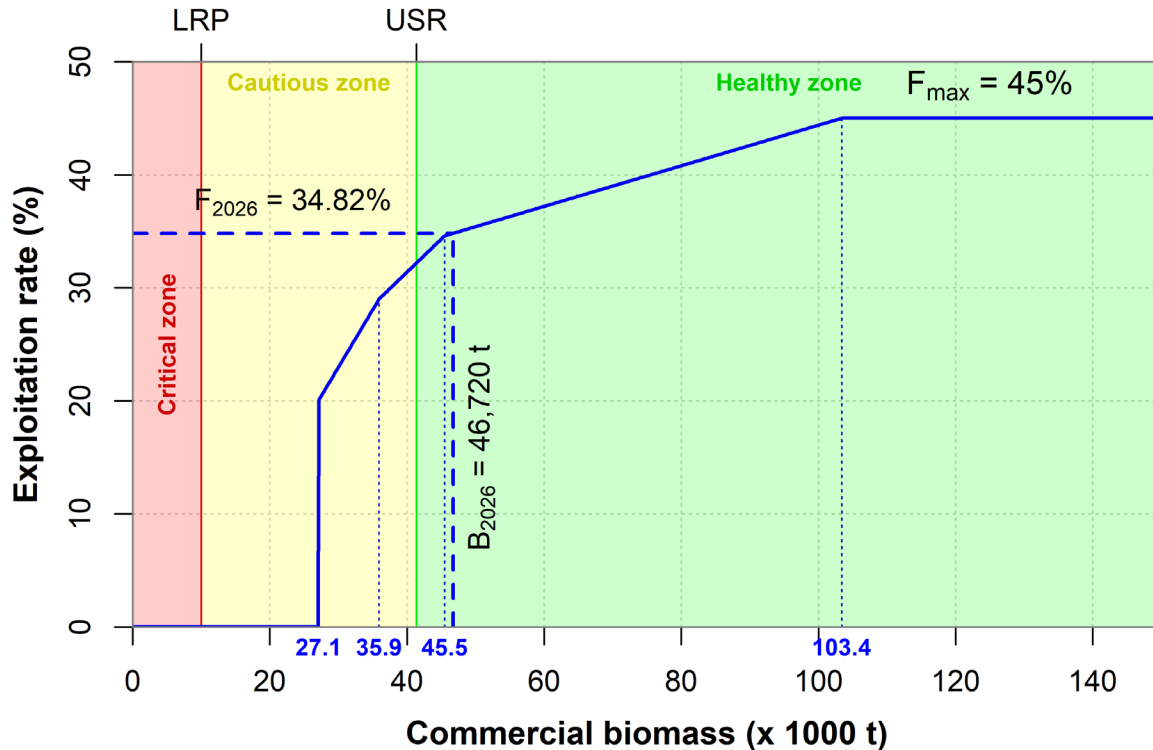


Figure 1. Harvest decision rule used for the southern Gulf St. Lawrence snow crab fishery (DFO 2014), which maps survey total commercial biomass to a target exploitation rate (solid blue line). The red line shows the limit reference point (LRP) for the residual biomass and the green line shows the upper stock reference (USR) point for the total commercial biomass. F_{max} represents the maximum allowed exploitation rate. The blue dashed line shows the projected commercial biomass for 2026 and its corresponding target exploitation rate. Dotted blue lines indicate inflection points in the harvest decision rule.

Data

- Commercial landings/sales slips: 1967-2025.
- Fishery logbooks: 1987-2025.
- Snow crab trawl survey: 1997-2025.
- Oceanographic data from September research vessel (RV) survey: 1971-2025.

Data changes:

- Survey design changes in 2006 and 2012, including expansion of the survey area and survey station redistribution.
- The survey vessel changed in 1999, 2003, 2013 and 2019 with possible changes in survey catchability.

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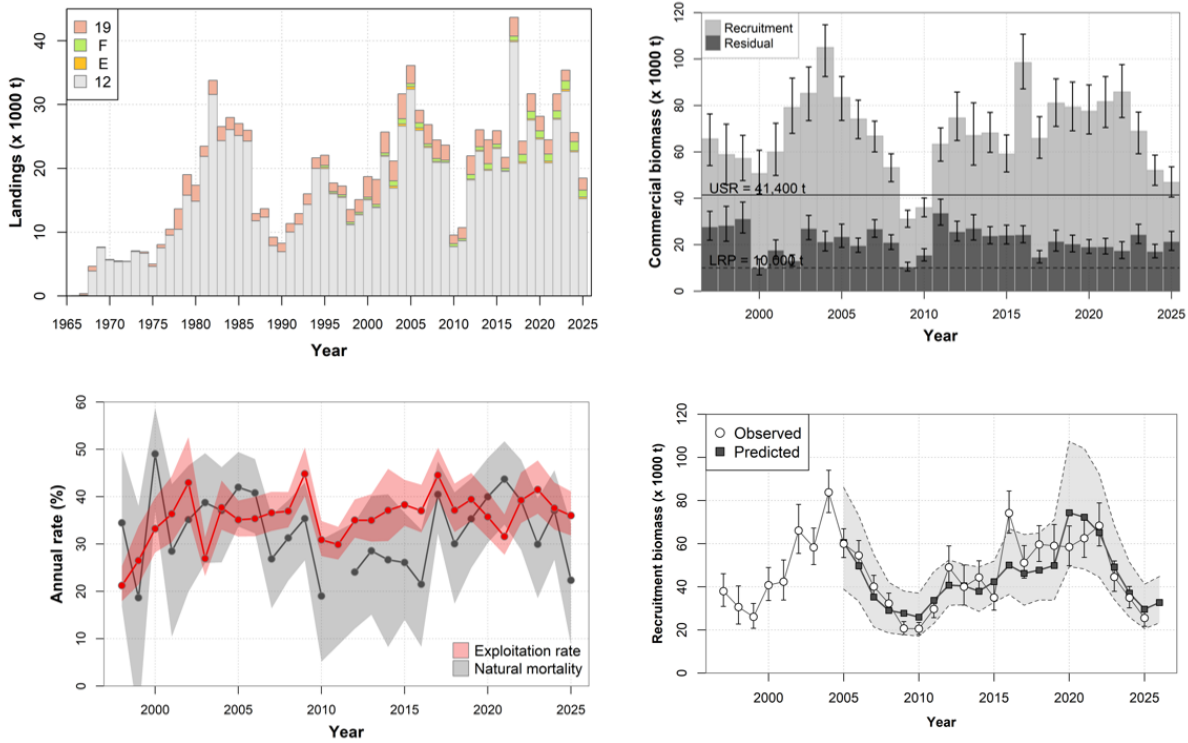


Figure 2. (Top left) Landings (in tonnes) of snow crab in the southern Gulf of St. Lawrence by fishing area, (Top right) Commercial recruitment and residual biomass in relation to the Upper Stock Reference (USR) (dashed line) and Limit Reference Points (LRP) (solid line), (Bottom left) Natural mortality and exploitation rate for commercial snow crab, (Bottom right) Observed (open circles and 95% confidence interval error bars) and predicted (black squares and shaded 95% confidence intervals) commercial recruitment by survey year.

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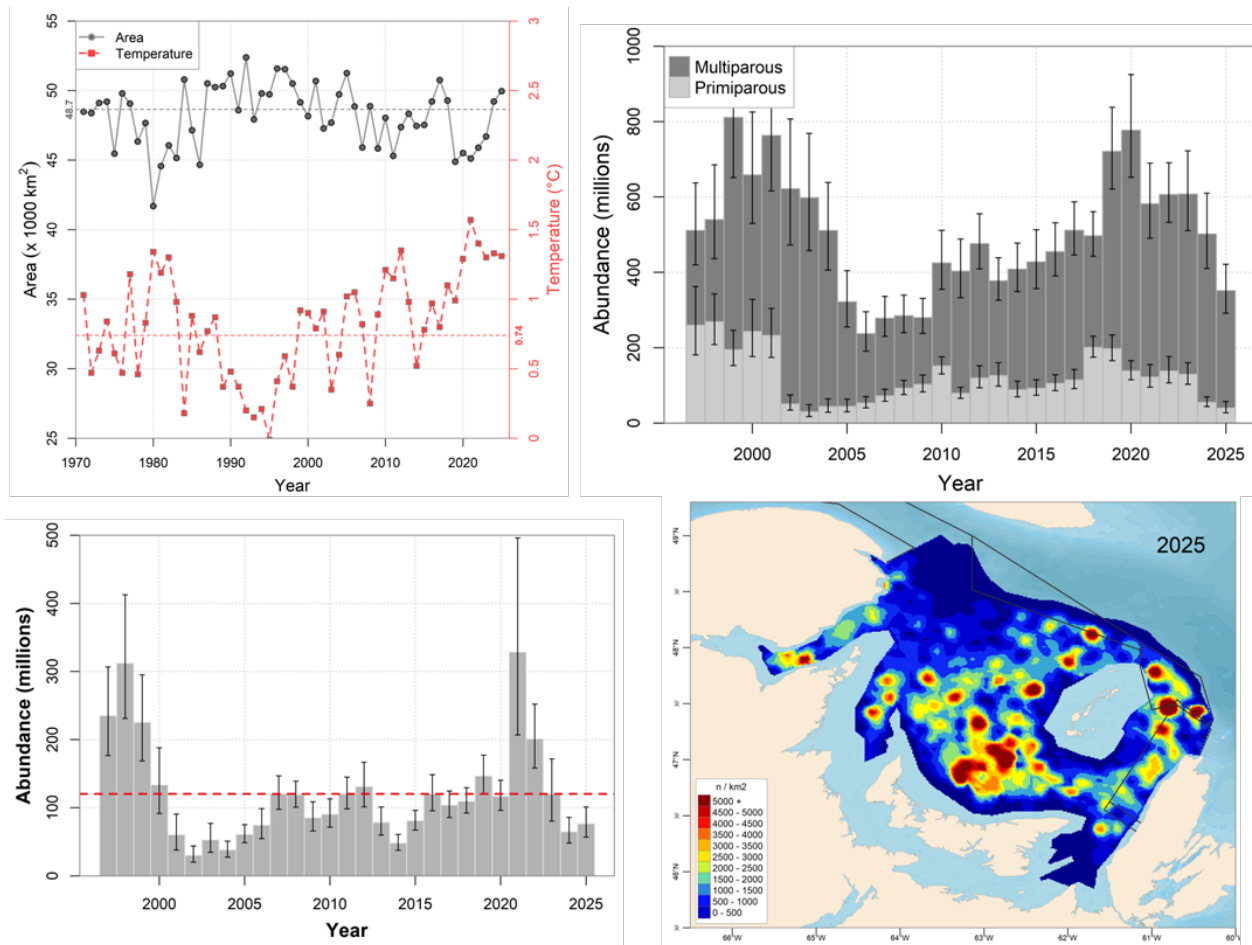


Figure 3. (Top left) Surface area within the polygon used for the biomass estimation and with bottom temperatures below 3 °C, an index of snow crab habitat, along with the mean temperature within the area. Horizontal dashed lines are the averages over the time series (1991-2020). (Top right) Abundance (in millions; means with 95% confidence intervals) of female spawners (primiparous and multiparous) and (Bottom left) population recruits (male instar VIII, 34 to 44 mm of carapace width), based on the trawl survey data. The red dashed line shows the average for the series. (Bottom right) Density contours (number per km²) of commercial crab in the southern Gulf of St Lawrence in 2025.

Stock Status and Trends

Biomass

The 2025 sGSL snow crab commercial stock biomass, estimated at 46,720 t, is above the USR, placing the stock in the Healthy Zone. The residual component of the biomass is 21,377 t, which is well above the LRP (Figure 2, Top right). The commercial biomass index has been decreasing for the past three years, down 45% from 2022, 31% from 2023 and 10% from 2024. The spatial distribution of commercial snow crab biomass in the sGSL in 2025 is presented in Figure 3 (Bottom right). Recent decreases in commercial crab biomass are driven by decreases in population and fishery recruitment.

Abundance

After a period of high abundance in the early 2000's, the female spawning stock declined to low levels in 2006 and gradually increased to high levels until 2023, but has since decreased and

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now stands at 352 million crab, which is below average, caused by low and record-low abundances of incoming new-shelled females in 2024 and 2025, respectively (Figure 3, Top right).

Natural Mortality

Over the time series, natural mortality of the commercial snow crab varied from 19% to 50%, with an average of 33%. In 2025, natural mortality stood at 23%, the lowest value since 2016 (Figure 2, Bottom left).

Recruitment

Population recruitment indices, which were at record levels in 2021, are below average in 2025 (Figure 3, Bottom left). Fishery recruitment is currently at a low level but is projected to increase by 28% in 2026 (Figure 2, Bottom right).

History of the Snow Crab Fishery

Snow crab landings from the sGSL were low in the early 1970s but increased more than threefold from 1975 to 1982. There were four periods of high landings (exceeding 20,000 t): 1981 to 1986, 1994 and 1995, 2002 to 2009, and recently from 2012 to 2024, the longest in the series (Table 1, Figure 2, Top left).

Catch per unit effort (CPUE) values in Crab Fishing Area (CFA) 12 decreased from 60.3 kilograms per trap haul (kg/th) in 2024 to 52.7 kg/th in 2025. CPUE values in CFA 12E decreased from 78.2 kg/th in 2024 to 36.2 kg/th in 2025. CPUEs in CFA 12F only slightly decreased from 90.0 kg/th in 2024 to 79.0 kg/th in 2025. The CPUE value for CFA 19 decreased from 136.5 kg/th in 2024 to 113.5 kg/th in 2025. CPUE values for CFA 19 are typically much higher than those of other CFAs.

Table 1. Landings, fishing effort and catch per unit effort from logbooks in the southern Gulf of St. Lawrence snow crab, Chionoecetes opilio, fisheries (Crab Fishing Areas 12, 12E, 12F and 19) from 2018-2025 (note: landings for 2025 are preliminary).

Year	Landings (t)					Effort (number of trap hauls)				Catch per unit effort (kg/trap haul)			
	12	12E	12F	19	Total	12	12E	12F	19	12	12E	12F	19
2018	20,769	260	1,183	2,048	24,260	469,887	5,579	17,120	13,120	44.2	46.6	69.1	156.1
2019	27,554	224	1,166	2,763	31,707	496,468	3,415	18,083	24,518	55.5	65.7	64.5	112.7
2020	24,554	234	1,084	2,284	28,156	556,780	5,098	22,168	22,458	44.1	45.9	45.2	101.7
2021	21,423 ¹	223	592	2,241	24,479	363,136	5,314	18,612	18,384	57.4	55.7	59.1	121.0
2022	27,620 ¹	197	1,173	2,671	31,661	537,820	2,509	15,240	23,690	51.4	78.5	76.5	112.6
2023	32,084 ¹	291	1,329	1,700	35,404	444,480	3,678	13,718	12,088	72.2	79.1	96.9	140.6
2024	22,560	203	1,431	1,422	25,616	374,043	2,588	15,896	10,420	60.3	78.2	90.0	136.5
2025	15,236	269	1,096	1,876	18,530	289,239	7,437	13,873	16,532	52.7	36.2	79.0	113.5

¹Total landings in CFA 12 include landings allocated to CFAs 12E (2021, 2022, 2023) and 12F (2021) that were fished in CFA 12.

Stock Advice: Projections and Risk Analysis for 2026 sGSL snow crab fishery

Table 2. Risk analysis for different catch options for the 2026 southern Gulf of St. Lawrence snow crab fishery showing the probability that the residual biomass (B_{res}) would be below the limit reference point (LRP), and the probability that the total commercial biomass (B) would be below the upper stock reference (USR), and the predicted biomass for the 2026 survey. In bold is the catch option corresponding to an exploitation rate of 34.82%, the rate as per the harvest decision rule.

Catch option (t)	Probability		Predicted survey biomass for 2026 (t)
	$B_{res} < LRP$	$B < USR$	
13,000	0.0%	5.1%	50,351 (39,996-62,935)
14,000	0.0%	7.7%	49,351 (38,996-61,935)
15,000	0.3%	11.2%	48,351 (37,996-60,935)
16,000	1.2%	15.4%	47,351 (36,996-59,935)
16,268	1.7%	16.7%	47,013 (36,657-59,636)
17,000	4.1%	20.5%	46,351 (35,996-58,935)
18,000	11.1%	26.4%	45,351 (34,996-57,935)
19,000	23.3%	32.8%	44,351 (33,996-56,935)
20,000	39.9%	39.6%	43,351 (32,996-55,935)

Ecosystem and Climate Change Considerations

Water temperature can affect several physiological and biological aspects of snow crab. Bottom temperatures in the core snow crab habitat are typically below 3 °C. Overall, bottom temperatures for the sGSL during 2025 remained warmer than the time-series average. In CFA 12, temperatures were 0.5 to 2 °C (or more) above average.

The surface area with bottom temperatures below 3 °C in September, and within the polygon used for the estimation of the commercial biomass, rose slightly in 2025 and was above the long-term average (48,640 km²) (Figure 3, Top left). The average temperature within that area (1.31 °C) remains above the long-term average (0.73 °C) and is similar to the temperature observed in 2023 and 2024. The 2025 average temperature is the sixth highest of the 1971-2025 time series.

SOURCES OF UNCERTAINTY

Changes in sampling design and trawling protocols have led to improvements in the survey over the years. However these changes, particularly the expansion of the survey area, the relocation of survey stations and variations in the survey's timing, may have led to variations in survey catchability. In addition, trawl catchability is known to vary with bottom type, sea conditions, current, vessel type and trawl geometry.

There is continued evidence of warming conditions in the sGSL that can impact snow crab population dynamics and distribution.

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