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Proceedings 2017/023

Quebec Region

Proceedings of the Regional Peer Review Meeting on the Assessment of the Estuary and Northern Gulf of St. Lawrence Snow Crab Stocks

February 14 and 15, 2017
Mont-Joli, Quebec

Chair: Denis Chabot
Rapporteur: Sonia Dubé

Maurice Lamontagne Institute
Fisheries and Oceans Canada
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June 2017

Canada

Foreword

The purpose of these proceedings is to document the key activities and discussions that took place during the meeting. The proceedings may include research recommendations, uncertainties and the rationale for decisions made during the meeting. They may also document when data, analyses or interpretations were reviewed and rejected on scientific grounds, including the reason(s) for rejection. As such, interpretations and opinions presented in this report may be factually incorrect or misleading, but are included to record as faithfully as possible what was considered at the meeting. No statements are to be taken as reflecting the conclusions of the meeting unless they are clearly identified as such. Moreover, further review may result in a change of conclusions where additional information was identified as relevant to the topics being considered, but not available in the timeframe of the meeting. In the rare case when there are formal dissenting views, these are also archived as appendices to the proceedings.

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SUMMARY

This document contains the proceeding from the meeting held within the regional assessment process on Snow crab in the Estuary and Northern Gulf of St. Lawrence. This review process was held on February 14-15, 2017 at the Maurice Lamontagne Institute in Mont-Joli. This meeting gathered about fifty participants from science, management and industry. These proceedings contain the essential parts of the presentations and discussions held, and report the recommendations and conclusions that were presented during the review.

SOMMAIRE

Ce document renferme le compte rendu de l’examen régional par des pairs portant sur l'évaluation des stocks de crabe des neiges de l’estuaire et du nord du golfe du Saint-Laurent. Cette revue, qui a eu lieu les 14 et 15 février 2017 à l'Institut Maurice-Lamontagne à Mont-Joli, a réuni une cinquantaine de participants des sciences, de la gestion et de l’industrie. Ce compte rendu contient l'essentiel des présentations et des discussions qui ont eu lieu pendant la réunion et fait état des recommandations et conclusions émises au moment de la revue.

INTRODUCTION

The Quebec Region of Fisheries and Oceans Canada (DFO) is responsible for assessing several stocks of fish and invertebrate species harvested in the Estuary and Gulf of St. Lawrence. Most of these stocks are periodically assessed as part of a regional advisory process conducted at the Maurice Lamontagne Institute in Mont-Joli. This document consists of the proceedings of the meeting held on February 14 and 15, 2017, on the assessment of the Estuary and Northern Gulf of St. Lawrence Snow Crab stock.

The objective of the review was to determine whether there were any changes in the resource's status and whether management plans needed to be adjusted based on the chosen conservation approach. The ultimate goal was to produce a Science Advisory Report on the management of Snow Crab stocks in the Estuary and Northern Gulf of St. Lawrence for the 2017 fishing season.

These proceedings report on the main points discussed in the presentations and deliberations stemming from the activities of the regional stock assessment committee. The regional review is a process open to all participants who are able to provide a critical outlook on the status of the assessed resources. Accordingly, participants from outside DFO are invited to take part in the committee's activities within the defined terms of reference for this review (Appendices 1 and 2). The proceedings also list the recommendations made by meeting participants.

CONTEXT

The meeting Chair, Denis Chabot, summarized the peer review objectives and process. He reviewed the agenda and the Terms of Reference for the meeting. The participants introduced themselves. Assessment Biologist Jean Lambert noted the contributions made by the participants. He provided a general overview of landings on the Atlantic coast and by fishing area (16, 17, 15, 16A, 12C, 13, 14, 12A and 12B). In 2016, landings totalled 9,167 t, a 7%-increase over 2015. Area 16 accounted for the largest share of landings, although Area 17's share was increasing.

The conservation principle that applies to these areas seeks to protect reproductive potential. Management measures include limiting catches by setting a total allowable catch (TAC), controlling effort (number of traps, number of licences and fishing season) and setting the minimum legal carapace size at 95 mm. In addition, the fishery is closed when catches in an area include more than 20% white crab.

The data used in the assessment are mainly from the fishery (ZIFF and logbooks, commercial sampling) and independent sources (post-season survey, trawl survey). These data provide the key stock status indicators, including the commercial catch per unit effort (CPUE), post-season number per unit effort (NPUE), combined CPUE and NPUE index, carapace condition at landing, prospects for recruits/adolescents and crab left by the fishery, distribution of fishing effort, average size and size frequency.

Mr. Lambert then provided a brief overview of the various carapace conditions and crab categories mentioned in the review. Categories 1 and 2 are recruits, and categories 3 to 5 are crabs left by the fishery. Mr. Lambert said the combined index was based on the average of both commercial biomass indices (standardized CPUE from the commercial fishery and NPUE of adults ≥ 95 mm in the post-season survey).

Before going into the details of the assessment area by area, a few environmental considerations were introduced, including the preferred temperatures at various life stages (0 to

2°C for initial benthic stages; below 3 to 4°C for large crabs) as well as the temporal trend of the area of the bottom ≤ 3°C per area.

- Participants noted a decrease in preferred Snow Crab habitat (≤ 3°C) in several areas resulting from warming of deep waters in the Gulf of St. Lawrence.

ASSESSMENT OF THE RESOURCE

Mr. Lambert reviewed the key indicators for each fishing area. A summary for the area was then presented as well as the wording of three exploitation scenarios that mention the potential impact on biomass. Participants asked questions and made comments. In this meeting, it was specified that participants must agree on the wording of all three scenarios (intensive, intermediate, careful). The preferred option will be discussed at the Advisory Committee meeting.

Area 16

Indicators: Area 16

The TAC increased by 10% to 4,561 t between 2015 and 2016, and was reached. The catch rate decreased during the 2016 commercial fishery and was slightly below average. Landings consisted of a slight majority of recruits.

The commercial biomass index in the post-season survey decreased in 2016 versus 2015, which was primarily attributable to a decrease in recruitment. However, it was still above average.

The combined index of commercial CPUE and NPUE from the post-season survey decreased, suggesting that less biomass will be available to the fishery in 2017 than in 2016.

The trawl survey conducted in the western part of the area indicated a decrease in the abundance of adolescents ≥ 78 mm in 2016. These results suggested lower recruitment in the short and/or medium term. However, the trawl results suggested an increase in recruitment in the longer term (5 to 7 years).

A marked decrease in preferred Snow Crab habitat in Area 16 has been observed in recent years, which could affect Snow Crab productivity.

A participant made the following comment:

- During the trawl survey, a significant loss of adolescents was observed between 2015 and 2016, possibly due to a delay in moulting.

Summary and outlook: Area 16

Participants discussed the summary and scenarios presented:

- Participants found that juveniles were more affected by the sharp decline in preferred habitat, although the decline will undoubtedly affect all individuals. Habitat contraction could increase internal control via competition.
- Some participants were of the view that warming can cause commercial size to be reached more quickly.
- It was noted that the return of predators can also have an impact. It was suggested that greater emphasis be placed on the stomach contents of large predators given their resurgence.

- In fact, various factors may come into play, but for now it is difficult to assess the extent of the impact on Snow Crab stocks.
- For the most part, the participants agreed on the proposed scenarios.

The following scenarios were proposed and accepted:

The drop in the combined index suggests that 2017 catches should decrease compared to 2016:

1) A decrease in catches of less than 20% would lead to a high harvesting intensity and increase the effect of expected lower recruitment.
2) A decrease of approximately 25% would be unlikely to lead to an excessively high harvesting intensity and would moderate the effect of expected lower recruitment.
3) A decrease of 30% could help maintain a substantial biomass available to the fishery over a longer period of time.

AREA 17

Indicators: Area 17

The TAC increased by 25% to 1,678 t between 2015 and 2016, and was reached. The catch rate increased during the 2016 commercial fishery and was well above average. Landings consisted primarily of intermediate-shell crabs, although the percentage of recruits had increased since 2015.

The commercial biomass index from the post-season survey increased due to a slight rise in recruits and crab left by the fishery. However, this index remains below average.

The combined index of commercial CPUE and NPUE from the post-season survey increased, suggesting that the biomass available to the fishery in 2017 will be higher than in 2016.

The average size of crabs caught in the commercial fishery remained low despite a slight increase, and according to the post-season survey, the average size could increase in 2017. The post-season survey indicated a decrease in the abundance of adolescents ≥ 78 mm. This result was not consistent with 2015 trawl and experimental trap survey results, which suggested an increase in 2016.

Preferred Snow Crab habitat in Area 17 decreased significantly in recent years, which could have an impact on stock productivity.

Participants did not have any questions regarding the indicators presented.

Summary and outlook: Area 17

Participants discussed the summary and scenarios presented:

- The participants wondered about the possibility that a decrease in preferred habitat can lead to an increase in catches given that crabs become more concentrated.
- Two points of view were expressed regarding the decrease in adolescents ≥ 78 mm. Some believed that the adolescents were intimidated and did not go into traps. Others thought there was a real decrease.
- However, there was consensus on the scenarios presented.

The participants agreed on the following scenarios:

The rise in the combined index suggests that catches could increase in 2017 compared to 2016:

1) An increase in catches of 30% or more would lead to a high harvesting intensity, which could reduce the expected increase in commercial biomass.
2) An increase of 25% should lead to a moderate harvesting intensity and help increase the biomass available to the fishery.
3) An increase of 15% or less would help increase the biomass available to the fishery or maintain it over a longer period.

AREA 15

Indicators: Area 15

The TAC increased by 10% between 2015 and 2016 to a peak of 789 t and was reached. The commercial fishery catch rate decreased, but was well above average. Landings consisted primarily of intermediate-shell crab.

The commercial biomass index from the post-season survey dropped below average. The temperature increase in the deep layer of the Anticosti Channel and the thinning of the cold intermediate water layer may have caused some crab to move to shallow waters not sampled by the survey.

The combined index composed of the commercial CPUE and the post-season survey NPUE decreased, suggesting that the biomass available to the fishery in 2017 will be lower than in 2016.

The post-season survey indicated that adolescent crabs ≥ 78 mm decreased to slightly below average, suggesting low recruitment in the short to medium term, as also expected in adjacent traditional fishing areas 16 and 14.

Participants made a few comments:

- Participants wondered about the impact of changing traps (Japanese instead of standard) and on the approach for standardizing the series. A meeting may need to be held on this topic. For the time being, only data on Japanese traps are recorded to calculate the combined index.
- Although concerns were raised, a participant said standardization should allow historical data to be reconverted. Fishermen in this area will therefore not be penalized compared to fishermen in other areas who changed traps earlier.
- Participants raised a caveat about the reliability of NPUE regarding crabs left by the fishery and recruits in the post-season survey. Participants decided that these data would not be considered in the assessment. The same concerns about post-season survey sampling applied to areas 16A and 12C.
- Participants also wondered about the decrease in adults which seemed excessive in the post-season survey. Should more weight be given to the commercial survey? It looks like it. This should be mentioned before the scenarios are developed.
- It would also be interesting to see what is going on near the coastlines to find out whether the crabs are moving to another area.

Summary and outlook: Area 15

Participants discussed the summary and scenarios presented:

- There was consensus on the proposed scenarios, provided that a preamble be included underlining the uncertainty regarding the post-season survey.

The participants accepted the following scenarios:

The uncertainty surrounding the crab's range during the post-season survey provides a rationale for increasing the weighting of the commercial biomass indicator during the fishery (catch per unit effort or CPUE). However, this indicator suggests that 2017 catches should decrease compared to 2016:

1) A decrease of less than 15% would lead to a high harvesting intensity and increase the effect of expected lower recruitment.
2) A decrease of approximately 20% would be unlikely to lead to an excessively high harvesting intensity and would moderate the effect of expected low recruitment.
3) A decrease of 25% or more could help maintain a substantial biomass available to the fishery over a longer period of time.

AREA 14

Indicators: Area 14

The TAC increased by 5% to 762 t between 2015 and 2016, and was reached. The commercial fishery catch rate increased slightly in 2016 and was the highest in the series. Landings consisted primarily of intermediate-shell crab.

The commercial biomass index from the post-season survey decreased due to a sharp drop in recruitment.

The combined index of commercial CPUE and NPUE from the post-season survey decreased, but remained high, suggesting that the biomass available to the fishery will be lower in 2017 than in 2016.

The post-season survey indicated a low abundance of adolescent crabs ≥ 78 mm since 2015, suggesting that recruitment to the fishery will continue to be low in the short to medium term.

The participants did not raise any issues.

Summary and outlook: Area 14

Participants discussed the summary and scenarios presented:

- There were no particular concerns regarding this area.
- The participants accepted the scenarios as proposed.

The participants agreed on the following scenarios:

The drop in the combined index suggests that 2017 catches should decrease compared to 2016:

1) A decrease of less than 10% would lead to a high harvesting intensity and increase the effect of expected lower recruitment.

2) A decrease of approximately 15% would be unlikely to lead to an excessively high harvesting intensity and would moderate the effect of expected low recruitment.

3) A decrease of 20% or more could help maintain a substantial biomass available to the fishery over a longer period of time.

AREA 16A

Indicators: Area 16A

The TAC decreased by 10% to 510 t between 2015 and 2016, and it was reached. The commercial catch rate decreased in 2016 and was below average. Landings consisted primarily of intermediate-shell crab.

The commercial biomass index from the post-season survey in 2016 decreased compared to 2015.

The combined index of commercial CPUE and NPUE from the post-season survey decreased in 2016 compared to 2015 and was well below average, suggesting that the commercial biomass available to the fishery will be lower in 2017 than in 2016.

The post-season survey indicated that the abundance of adolescent crabs had remained near average since 2013, suggesting that recruitment to the fishery will vary little in the short and medium term.

Preferred Snow Crab habitat in Area 16A has decreased in recent years, which could have an impact on stock productivity.

Participants made a few comments:

- A participant said additional traps had been set in shallower waters. They will be kept. However, for 2016, moving the effort near the coastlines did not produce any noticeable increase in catches.
- The same bias was observed as in Area 15 regarding crabs left by the fishery and recruits in the post-season survey. This should be taken into account when preparing the summary. However, there were no concerns about the combined index calculation.

Summary and outlook: Area 16A

Participants commented briefly on the summary and scenarios presented:

- It was decided that the proposed scenarios be kept, with the proviso that recruitment be described as average rather than low.

The participants agreed on the following scenarios:

The drop in the combined index suggests that 2017 catches should decrease compared to 2016:

1) A decrease of 10% or less would lead to a high harvesting intensity in an average recruitment period.

2) A 15 to 20% decrease would be unlikely to lead to an excessively high harvesting intensity.

3) A decrease of over 20% could help maintain the biomass available to the fishery over a longer period of time.

AREA 13

Indicators: Area 13

The TAC increased by 20% to 338 t between 2015 and 2016, and it was reached. When the area was reopened in 2008, it was decided that precautionary, meaning low, TACs would be in effect at first and would gradually increase only if the stock indices remained positive despite harvesting. The commercial fishery catch rate increased slightly in 2016 and was well above the 1988–2015 average. In 2016, fishing effort was divided almost equally between the northern and southern parts of the area. Landings consisted primarily of intermediate-shell crab.

Post-season surveys suggested an increase in commercial biomass in the north, the highest level in the series, and a decrease in the southern part of the area. Based on these surveys, recruitment was high in the northern section and low in the southern section.

The combined index of commercial CPUE and NPUE from the post-season surveys increased slightly to the highest value of the series. This result suggested that the biomass available to the fishery in 2017 will be slightly higher than in 2016.

The post-season survey in the northern section indicated an increase in the abundance of adolescents ≥ 78 mm, whereas the trawl survey indicated a decrease. The post-season survey conducted in the southern section also indicated a low abundance of adolescents ≥ 78 mm.

The trawl survey indicated a high abundance of crabs < 40 mm in the northern section, suggesting high recruitment to the fishery in the long term (5–7 years).

Participants made a few comments:

- The combined index is not weighted to consider north or south. It is an average of both surveys.
- The participants noted a slight increase in size in the northern section related to the warming of the Mécatina Trough, which was encouraging.

Summary and outlook: Area 13

Participants discussed the summary and scenarios presented:

- It is important to include a sentence to provide background information on this area (which is not fully exploited) to indicate that there is room for some flexibility in terms of management.
- In the first scenario, it was suggested that the increase be 15 to 20% rather than 15% or more, and that exploitation not be described as “high” in scenarios 1 and 2. Scenario 3 should be rewritten to reflect these changes.

The participants agreed on the following scenarios:

This stock was reopened to fishing in 2008, and it was subject to a conservative harvesting approach. The slight rise in the combined index suggests that it is possible to maintain or slightly increase catches in 2017 compared to 2016:

1) An increase in catches of 15 to 20% would lead to a high harvesting intensity and could reduce the biomass available to the fishery in 2018.
2) The status quo or an increase of no more than 10% would help maintain the biomass available to the fishery.
3) A decrease would help maintain a substantial biomass available to the fishery over a longer period of time.

AREA 12C

Indicators: Area 12C

The TAC decreased by 10% to 285 t between 2015 and 2016, and it was reached. The catch rate for the commercial fishery increased slightly in 2016 and is near average. Landings consisted primarily of intermediate-shell crab.

The commercial biomass index from the post-season survey decreased in 2016 and is now well below average.

The combined index of commercial CPUE and NPUE from the post-season survey remained stable and was below average, suggesting that the biomass available to the fishery in 2017 will be similar to 2016.

The post-season survey indicated that the abundance of adolescent crabs had remained near average since 2014, suggesting that recruitment to the fishery will vary little in the short and medium term.

Preferred Snow Crab habitat in Area 12C has decreased in recent years, which could have an impact on stock productivity.

A participant made the following comment:

- There was the same potential bias in areas 15 and 16A regarding crabs left by the fishery and recruits in the post-season survey.

Summary and outlook: Area 12C

Participants discussed the summary and scenarios presented:

- Participants decided to remove the term “or more” in scenario 1, because they were not comfortable with this flexibility.
- The remaining scenarios were accepted as proposed with minor changes in the wording.

The participants agreed on the following scenarios:

The stability of the combined index suggests that 2017 catches should be similar to 2016:

1) An increase in catches of 10% would lead to a high harvesting intensity and could reduce the biomass available to the fishery in 2018.
2) The status quo would be unlikely to lead to an excessively high harvesting intensity and should maintain the commercial biomass.
3) A decrease could help maintain or increase the biomass available over a longer period of time.

AREA 12A

Indicators: Area 12A

The TAC decreased by 30% to 106 t between 2015 and 2016, and it was reached. The commercial catch rate decreased in 2016 and was below average. Landings consisted primarily of intermediate-shell crabs.

There was no post-season survey in 2016.

The average size of crabs caught in the commercial fishery has been decreasing since 2013 due to a decline in the number of large crabs and a greater percentage of crabs near the legal size.

Preferred Snow Crab habitat in Area 12A has decreased in recent years, which could have an impact on stock productivity.

Participants made a few comments:

- Some think there is a lot of noise in the system. Fishermen's experience appears to be highly variable.
- Participants were disappointed that there was no post-season survey in 2016. This means that we will have to exercise more caution in forming our opinion.

Summary and outlook: Area 12A

Participants made some comments on the summary and scenarios presented:

- Prior to selecting scenarios, the need to be more cautious should be emphasized given the lack of information due to the fact that there was no post-season survey.
- Several participants were not comfortable with a status quo scenario. The first scenario therefore became "a less than 10% decrease."

Finally, the participants agreed on the following scenarios:

The decrease in the commercial catch rate suggests that 2017 catches should decrease compared to 2016. A lack of information due to the absence of a post-season survey warrants greater caution in the choice of scenarios:

1) A decrease in catches of less than 10% would lead to a high harvesting intensity and could reduce the biomass available to the fishery in 2018.
2) A decrease of approximately 15% could lead to a moderate harvesting intensity and help maintain the biomass available to the fishery.
3) A decrease of over 15% could help increase the biomass available or maintain it over a longer period.

AREA 12B

Indicators: Area 12B

The TAC decreased by 15% to 311 t between 2015 and 2016. Landings were 193 t. The difference between the TAC and landings was largely due to the fact that some fishermen stopped fishing early because of low yields. The commercial catch rate decreased significantly and was the lowest in the series. Landings consisted primarily of intermediate-shell crab.

The commercial biomass index from the post-season survey decreased from 2015 levels due to a decrease in residual biomass and recruitment.

The combined index composed of the commercial CPUE and the post-season survey NPUE decreased, suggesting that the biomass available to the fishery in 2017 will be lower than in 2016.

The post-season survey indicated a low abundance of adolescent crabs of ≥ 78 mm since 2014, suggesting that recruitment to the fishery will continue to be low in the short to medium term.

Preferred Snow Crab habitat in Area 12B decreased significantly in recent years, which could have an impact on stock productivity.

Participants made a few comments:

- This area appeared to be one of the most affected by warming and therefore by the loss of preferred Snow Crab habitat.
- In addition, industry members believed that predation (e.g. cod, halibut) would have a significant impact on small crabs and females.
- Participants were concerned about the sharp drop in residual biomass and recruits in the post-season survey.

Summary and outlook: Area 12B

There were some comments on the summary and scenarios presented:

- According to some participants, the difference between the TAC and landings may have been attributable to fishermen moving to other areas. Socio-economic factors could therefore explain the failure to land the TAC. It was suggested that this be mentioned in the summary and preamble to scenarios.
- Participants agreed that the results of all indices were not very encouraging. Some participants believed that the scenarios should be more cautious. There was a significant discrepancy between the proposals and the decrease in the combined index, even if there was some uncertainty in this index.
- It would be advisable to review the warnings that were made when creating this mini-area (overflow area).
- Therefore, the participants decided to replace “an insufficient decrease” with “a decrease of about 20% or less” in scenario 1.
- For scenario 2, “a decrease of approximately 40%” was recommended rather than “a minimum 20% decrease.” Scenario 3 became “a decrease of more than 40%.”

The participants agreed on the following wordings:

The drop in the combined index suggests that 2017 catches should decrease compared to 2016. Failure to achieve TAC could be partly explained by socio-economic factors:

1) A decrease in catches of 20% or less would lead to a high harvesting intensity and could reduce the biomass available in 2018.
2) A decrease of approximately 40% would moderate the harvesting intensity.
3) A decrease greater than 40% could help maintain the biomass available to the fishery if environmental conditions do not deteriorate further.

RESEARCH IDENTIFICATION AND PRIORITIZATION

A few points were raised regarding research priorities during this review:

- It was suggested that the protocol for some post-season surveys be reviewed in order to better sample shallower waters.
- Gather temperature data during the post-season survey, and take a closer look crab distribution and migration based on temperature.

- Continue to map preferred Snow Crab habitat, taking optimal temperatures and sediment into account.
- Study the influence of temperature on growth.

APPENDIX 1- LIST OF PARTICIPANTS

Name	Affiliation
Bernier, Denis	DFO Science
Boucher, André*	Industry
Boucher, Jean-René*	Industry
Boudreau, Mathieu**	DFO Science
Bourassa, Luc	Biologist consultant
Bourdages, Hugo	DFO Science
Bourdages, Yan**	Industry
Brulotte, Sylvie*	DFO Science
Bruneau, Benoît*	DFO Science
Collier, Frank	Industry
Côté, Langis	Industry
Couillard, Catherine*	DFO Science
Chabot, Denis	DFO Science
Chevalier, Jody (tel)**	Industry
Cyr, Charley	DFO Science
Dallaire, Jean-Paul	DFO Science
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Dupuis, Mario*	Industry
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Galbraith, Peter	DFO Science
Gauthier, Pierre	Industry
Gauthier, Sylvain*	Industry
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Hardy, Magalie	MPO Gestion des pêches
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Jones, Neal (tel)**	Industrie
Lambert, Jean	DFO Science
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Landry René	Industry
Langelier, Serge	Industry
Lavallée, Dean (tel)**	Industry
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Morin, Mathieu	DFO Fisheries management
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Vallée, Simon*	Industry
Vigneault, Guy*	Industry

* Day one only, ** Day two only

APPENDIX 2- TERMS OF REFERENCE

Assessment of the Estuary and northern Gulf of St. Lawrence Snow Crab stocks

Regional Peer Review - Quebec Region

February 14-15, 2017
Mont-Joli, Québec

Chairperson : Denis Chabot

Context

The snow crab fishery in the Estuary and the northern Gulf of St. Lawrence began in the late 1960s. Landings have varied depending on the adjusted Total Allowable Catches (TACs) based on the recruitment waves and troughs. In 2015, landings have totaled 8,554 t, down by 14% from 2014.

The Estuary and northern Gulf of St. Lawrence are divided into nine management areas (13 to 17, 16A, 12A, 12B and 12C). The effort is controlled by a fishing season as well as a limited number of licences and traps and catches are limited by quotas. The legal size is 95 mm.

The resource is assessed each year to determine whether changes that have occurred in the stock status necessitate adjustments to the conservation approach and management plan.

Objectives

Provide scientific advice to determine TACs for the snow crab stocks in the Estuary and northern Gulf of St. Lawrence: management units 13 to 17, 16A, 12A, 12B and 12C for the 2017 fishing season. The advice shall include:

- Description of the biology of the snow crab in the Estuary and northern Gulf of St. Lawrence;
- Description of the fishery including landings, fishing effort, carapace condition, size structure and mean carapace width for males;
- Analysis of catches per unit effort from the fishery;
- Analysis of data from post-season trap surveys conducted annually in collaboration with fishers. Indicators: number per unit of effort (NPUE) of legal-size and sub-legal-size crabs, mean carapace width for males and spermatheca load;
- Analysis of data from trawl survey(s) conducted annually in certain sectors or areas. Indicators: abundance index of legal-size and sub-legal-size males, size structure and maturity of both males and females;
- Identification and prioritization of research projects to be considered for the future;
- Perspectives and/or recommendations on management measures in effect for the 2017 fishing seasons, among others, harvest levels and their possible effects on the abundance and maintenance of the reproductive potential, based on a summary table of main indicators for the precautionary approach and short- and medium-term predictions.

Expected Publications

- Science Advisory Report on snow crab of the Estuary and Northern Gulf of St. Lawrence;
- CSAS Proceedings summarizing the discussion

Participation

- Fisheries and Oceans Canada (DFO) (Science, and Ecosystems and Fisheries Management sectors)

- Fishing industry
- Provincial representatives
- Aboriginal Communities / Organizations