# Hake Benchmark Assessment Meeting Schedule

| Meeting | Date | Location |
|---|---|---|
| Data I<br>Ecosystem Consumption (1) | Aug. 23<br>9:00 AM | Aquarium Conference Room<br>166 Water St.<br>Woods Hole MA |
| Data II | Sep. 7<br>10 am – 5:30 pm<br>Sep. 8-10<br>9 am – 5:30 pm | Aquarium Conference Room<br>166 Water St.<br>Woods Hole MA |
| **Assessment models** | **Oct. 25-29<br>9 am – 5:30 pm** | **Aquarium Conference Room<br>166 Water St.<br>Woods Hole MA** |
| Stock Assessment Review Committee (SAW) | Nov. 29 – Dec. 3 | Aquarium Conference Room<br>166 Water St.<br>Woods Hole MA |

**For the Assessment Models meeting, the following instructions may be used to participate remotely via the Internet:**

| **Date** | **Oct 25** | **Oct 26** | **Oct 27** | **Oct 28** | **Oct 29** |
|---|---|---|---|---|---|
| **Meeting number** | **796 245 781** | **798 404 317** | **794 639 620** | **792 391 220** | **796 746 910** |

Meeting Password: (This meeting does not require a password.). Please click the link below to see more information, or to join the meeting.

To join the online meeting (Now from iPhones too!)
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1. Go to https://nmfs-st.webex.com/nmfs-st/j.php?ED=147289832&UID=0 <https://nmfs-st.webex.com/nmfs-st/j.php?ED=147289832&UID=0>
2. Enter your name and email address.
3. Enter the meeting password: (This meeting does not require a password.)
4. Click "Join Now".
5. If the meeting includes a teleconference, follow the instructions that appear on your screen.

To join the teleconference only
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Teleconference Instructions

866/658-7997 (toll free); 517/833-7464 (toll; for international callers)
Participant code: 4319624

**Hake Models Meeting**

NEFSC Woods Hole Laboratory, Woods Hole, MA USA
Clark Conference Room

**25-29 October 2010**

**Draft Agenda**

**25 October 2010 – Monday**

9:00 – 12:15 Welcome and Introduction (Cadrin)
Review agenda and Terms of Reference (Cadrin)
Industry Meeting Review (Cadrin)
Data Meeting Review (Cadrin)
Review Ageing data for silver and red (Burnett)
Review Silver Hake Input Data (Alade)
Review Red Hake Input Data (Sosebee)
Review Offshore Hake Input Data (Traver)

12:15 – 1:15 Lunch
1:15 – 3:00 Silver Hake Models (Alade)
AIM
ASAP

3:00 – 3:15 Break
3:15 – 5:30 Continue with Silver Hake Models (Alade)

**26 October 2010 – Tuesday**

9:00 – 10:30 Red Hake Models (Sosebee)
AIM
SS3

10:30 – 10:45 Break
10:45 – 12:30 Continue with SS3 (Sosebee)
12:30 – 1:30 Lunch
1:30 – 3:00 Red Hake Models
SCALE (Nitschke)
3:00 – 3:15 Break
3:15 – 5:30 Continue with SCALE

**27 October 2010 – Wednesday**

9:00 – 10:00 Offshore Hake Models (Traver)
AIM
SEINE
CSA

| | |
|---|---|
| 10:00 – 10:15 | Break |
| 10:15 – 11:45 | Consumption |
| 11:45 – 1:15 | Lunch |
| 1:15 – 3:15 | Silver Hake Reruns |
| 3:15 – 3:30 | Break |
| 3:30 – 5:30 | Silver Hake Reruns |

**28 October 2010 – Thursday**

| | |
|---|---|
| 8:00 – 10:00 | Red Hake reruns |
| 10:00 – 10:15 | Break |
| 10:15 – 12:00 | Red Hake reruns |
| 12:00 – 1:00 | Lunch |
| 1:00 – 3:15 | Offshore Hake Reference points, stock status, projections, summary report |
| 3:15 – 3:30 | Break |
| 3:30 – 4:30 | Continue offshore hake |

**29 October 2010 – Friday**

| | |
|---|---|
| 9:00 – 10:00 | Silver Hake Reference points, stock status, projections, summary report |
| 10:00 – 10:15 | Break |
| 10:15 – 12:00 | Continue silver hake |
| 12:00 – 1:00 | Lunch |
| 1:00 – 3:15 | Red Hake Reference points, stock status, projections, summary report |
| 3:15 – 3:30 | Break |
| 3:30 – 4:30 | Continue red hake |
| 4:30 – 5:30 | Remaining items and drafting plans |

# *Final Assessment Terms of Reference for SAW/SARC51 (11/29 – 12/3, 2010)*

(file vers.: 4/23/2010)

**A. Silver hake (2 Stocks: Northern and Southern)**

For each stock or combined,

1. Estimate catch from all sources including landings, discards, and effort. Characterize the uncertainty in these sources of data, and estimate LPUE. Analyze and correct for any species mis-identification in these data.

2. Present the survey data being used in the assessment (e.g., regional indices of abundance, recruitment, state surveys, age-length data, etc.). Characterize the uncertainty and any bias in these sources of data.

3. Evaluate the validity of the current stock definition, and determine whether it should be changed. Take into account what is known about migration among stock areas.

4. Estimate annual fishing mortality, recruitment and stock biomass (both total and spawning stock) for the time series (integrating results from Silver hake TOR-5), and estimate their uncertainty. Include a historical retrospective analysis to allow a comparison with previous assessment results.

5. Evaluate the amount of silver hake consumed by other species as well as the amount due to cannibalism. Include estimates of uncertainty. Relate findings to the stock assessment model.

6. State the existing stock status definitions for "overfished" and "overfishing". Then update or redefine biological reference points (BRPs; estimates or proxies for $B_{MSY}$, $B_{THRESHOLD}$, and $F_{MSY;}$ and estimates of their uncertainty). If analytic model-based estimates are unavailable, consider recommending alternative measurable proxies for BRPs. Comment on the scientific adequacy of existing BRPs and the "new" (i.e., updated, redefined, or alternative) BRPs.

7. Evaluate stock status (overfished and overfishing) with respect to the existing BRPs, as well as with respect to the "new" BRPs (from Silver hake TOR 6).

8. Develop and apply analytical approaches and data that can be used for conducting single and multi-year stock projections and for computing candidate ABCs (Acceptable Biological Catch; see Appendix to the TORs).
    a. Provide numerical short-term projections (3 years). Each projection should estimate and report annual probabilities of exceeding threshold BRPs for F, and probabilities of falling below threshold BRPs for biomass. In carrying out projections, consider a range of assumptions about the most important uncertainties in the assessment (e.g., terminal year abundance, variability in recruitment).
    b. Comment on which projections seem most realistic, taking into consideration uncertainties in the assessment.
    c. Describe this stock's vulnerability to becoming overfished, and how this could affect the choice of ABC.

9. Review, evaluate and report on the status of the SARC and Working Group research recommendations listed in recent SARC reviewed assessments and review panel reports. Identify new research recommendations.

**B. Longfin squid (*Loligo*)**

1. Characterize the commercial catch including landings, effort, LPUE and discards. Describe the uncertainty in these sources of data.

2. Characterize the survey data that are being used in the assessment (e.g., regional indices of abundance, recruitment, age-length data, etc.). Describe the uncertainty in these sources of data.

3. Estimate annual fishing mortality, recruitment and stock biomass for the time series, and characterize the uncertainty of those estimates (consider *Loligo* TOR-4). Include a historical retrospective analysis to allow a comparison with previous assessment results.

4. Summarize what is known about consumptive removals of *Loligo* by predators and explore how this could influence estimates of natural mortality (M).

5. State the existing stock status definitions for the terms "overfished" and "overfishing". Then update or redefine biological reference points (BRPs; estimates or proxies for $B_{MSY}$, $B_{THRESHOLD}$, and $F_{MSY;}$ and estimates of their uncertainty). Comment on the scientific adequacy of existing BRPs and for the "new" (i.e., updated, redefined, or alternative) BRPs.

6. Evaluate stock status with respect to the existing BRPs, as well as with respect to the "new" BRPs (from *Loligo* TOR 5).

7. Develop approaches for computing candidate ABCs (Acceptable Biological Catch; see Appendix to the TORs), and comment on the ability to perform projections for this stock.

8. Review, evaluate and report on the status of the SARC and Working Group research recommendations listed in recent SARC reviewed assessments and review panel reports. Identify new research recommendations.

**C. Red hake (2 Stocks: Northern and Southern)**

For each stock or combined,

1. Estimate catch from all sources including landings, discards, and effort. Characterize the uncertainty in these sources of data, and estimate LPUE. Analyze and correct for any species mis-identification in these data.

2. Present the survey data that are being used in the assessment (e.g., regional indices of abundance, recruitment, state surveys, age-length data, etc.). Characterize the uncertainty in these sources of data.

3. Evaluate the validity of the current stock definition, and determine whether this should be changed. Take into account what is known about migration among stock areas.

4. Estimate measures of annual fishing mortality, recruitment and stock biomass (both total and spawning stock) for the time series, and characterize their uncertainty. Include a historical retrospective analysis to allow a comparison with previous assessment results.

5. State the existing stock status definitions for the terms "overfished" and "overfishing". Then update or redefine biological reference points (BRPs; estimates or proxies for $B_{MSY}$, $B_{THRESHOLD}$, and $F_{MSY;}$ and estimates of their uncertainty). If analytic model-based estimates are unavailable, consider recommending alternative measurable proxies for BRPs. Comment on the scientific adequacy of existing BRPs and the "new" (i.e., updated, redefined, or alternative) BRPs.

6. Evaluate stock status (overfished and overfishing) with respect to the existing BRPs, as well as with respect to the "new" BRPs (from Red hake TOR 5).

7. Develop and apply analytical approaches and data that can be used for conducting single and multi-year stock projections and for computing candidate ABCs (Acceptable Biological Catch; see Appendix to the TORs).
    a. Provide numerical short-term projections (3 years). Each projection should estimate and report annual probabilities of exceeding threshold BRPs for F, and probabilities of falling below threshold BRPs for biomass. In carrying out projections, consider a range of assumptions about the most important uncertainties in the assessment (e.g., terminal year abundance, variability in recruitment).
    b. Comment on which projections seem most realistic, taking into consideration uncertainties in the assessment.
    c. Describe this stock's vulnerability to becoming overfished, and how this could affect the choice of ABC.

8. Review, evaluate and report on the status of the SARC and Working Group research recommendations listed in recent SARC reviewed assessments and review panel reports. Identify new research recommendations.

**D. Offshore hake**

1. Use models to estimate the commercial catch. Describe the uncertainty in these sources of data.

2. Characterize the survey data that are being used in the assessment (e.g., regional indices of abundance, recruitment, age-length data, etc.). Describe the uncertainty in these sources of data.

3. Estimate measures of annual fishing mortality, recruitment and stock biomass for the time series, and characterize the uncertainty of those estimates.

4. State the existing stock status definitions for the terms "overfished" and "overfishing". Then update or redefine biological reference points (BRPs; estimates or proxies for $B_{MSY}$, $B_{THRESHOLD}$, and $F_{MSY;}$ and estimates of their uncertainty). If analytic model-based estimates are unavailable, consider recommending alternative measurable proxies for BRPs. Comment on the scientific adequacy of existing BRPs and the "new" (i.e., updated, redefined, or alternative) BRPs.

5. Evaluate stock status (overfishing and overfished) with respect to the existing BRPs, as well as with respect to the "new" BRPs (from Offshore hake TOR 4).

6. If a model can be developed, conduct single and multi-year stock projections and for computing candidate ABCs (Acceptable Biological Catch; see Appendix to the TORs).
    a. Provide numerical short-term projections (3 years). Each projection should estimate and report annual probabilities of exceeding threshold BRPs for F, and probabilities of falling below threshold BRPs for biomass. In carrying out projections, consider a range of assumptions about the most important uncertainties in the assessment (e.g., terminal year abundance, variability in recruitment).
    b. Comment on which projections seem most realistic, taking into consideration uncertainties in the assessment.
    c. Describe this stock's vulnerability to becoming overfished, and how this could affect the choice of ABC.

7. Propose new research recommendations.

## *Appendix to the SAW TORs:*

# Clarification of Terms used in the SAW/SARC Terms of Reference

(The text below is from DOC National Standard Guidelines, Federal Register, vol. 74, no. 11, January 16, 2009)

**On "Acceptable Biological Catch":**

*Acceptable biological catch (ABC)* is a level of a stock or stock complex's annual catch that accounts for the scientific uncertainty in the estimate of [overfishing limit] OFL and any other scientific uncertainty…" *(p. 3208) [In other words, OFL ≥ ABC.]*

*ABC for overfished stocks.* For overfished stocks and stock complexes, a rebuilding ABC must be set to reflect the annual catch that is consistent with the schedule of fishing mortality rates in the rebuilding plan. *(p. 3209)*

NMFS expects that in most cases ABC will be reduced from OFL to reduce the probability that overfishing might occur in a year. (p. 3180)

ABC refers to a level of ''catch'' that is ''acceptable'' given the ''biological'' characteristics of the stock or stock complex. As such, [optimal yield] OY does not equate with ABC. The specification of OY is required to consider a variety of factors, including social and economic factors, and the protection of marine ecosystems, which are not part of the ABC concept. (p. 3189)

**On "Vulnerability":**

*"Vulnerability.* A stock's vulnerability is a combination of its productivity, which depends upon its life history characteristics, and its susceptibility to the fishery. Productivity refers to the capacity of the stock to produce MSY and to recover if the population is depleted, and susceptibility is the potential for the stock to be impacted by the fishery, which includes direct captures, as well as indirect impacts to the fishery (e.g., loss of habitat quality)." (p. 3205)

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