OUTLINE OF SEA CONDITIONS IN THE NORTHERN WATERS,
MAY-JULY 1966 (PRELIMINARY REPORT MAINLY BASED
ON THE WATER TEMPERATURE REPORTS)

by K. Kitano
Fisheries Agency of Japan

October 1966

1. INTRODUCTION

Water temperature values, which are considered to be an important element in the physical environment of salmon, were reported according to a prescribed form during the fishing season from May to July 1966 from salmon motherships, catcher boats, the research vessels Hokko-maru, Tsusan-maru, Nakashio-maru, Ariliso-maru and No. 2 Rumamoto-maru and the Hokkaido University training ships Oshoro-maru and Hokusei-maru.

The present report is mainly a discussion of the oceanographic characteristics of the fishing grounds of the mothership-type salmon fishery and related sea areas in 1966 based on data from the water temperature reports which have been received to date. The water temperatures were obtained by means of reversing thermometers or bathythermographs and include some uncorrected values.

Figures 1 to 14 show the horizontal distribution of water temperatures at 10 m and 100 m in solid lines for each 10-day period. For purposes of comparison, the distributions of isotherms for the same periods of 1965 are shown with dotted lines.

2. OCEANOGRAPHIC CONDITIONS AROUND THE TIP OF THE ALASKAN STREAM

In the vicinity of the tip of the Alaskan Stream, which flows west along the south side of the Aleutian Chain, water with temperatures of around 4°C at the 10 m level is usually encountered in late May, and this water gradually warms from one 10-day period to the next. In 1966 there was a gradual warming in the vicinity of 50°N, 170°E, with temperatures of 3°-4°C in late May, 5°C in mid-June, 6°-7°C in early July and 8°-9°C in late July. The trend of rising temperature did not differ much on the whole from that of the same period of the previous year, but the degree of extension of the cold water zone extending eastward south of the Alaskan Stream was somewhat more conspicuous.

The horizontal distribution of water temperatures at 100 m was very similar in phase to the distribution of temperatures in the dichothermal layer. The extent of the 4°C water indicated the scope of the Alaskan Stream comparatively well. The 4°C water did not appear west of 180° between late May and late June, extending only to the vicinity of 50°N, 170°E in mid- and late July. On the whole, the 4°C water was held more to the east of 180° in 1966. At the same period of the previous year it appeared between 170°E and 180°, at least in some places, and in 1963 it extended into the areas west of 170°E. Thus the 4°C water was limited to more easterly areas than in either 1965 or 1964 and was held much farther to the east than in 1963.

This may have been because of the greater development of the
dichothermal water than last year and a more active cooling of the Alaskan Stream area by horizontal mixing or it may have been that the rate of transport of the Alaskan Stream into the more westerly areas was lower. In 1966 there was a conspicuous extension of the cold water zone with temperatures around 2°C extending east along the south side of the Alaskan Stream, and the same tendency was seen at the 10 m level.

3. OCEANOGRAPHIC CONDITIONS IN THE BERING SEA

Water with temperatures of 5°-6°C was found at the 10 m level in late June and early July. On the basis of the fragmentary data that are available, it does not appear that there was any great difference from the same period of the previous year. On the other hand, the temperature distribution at 100 m showed on the whole an extension of 2°-3°C water, and temperatures appeared to be about 1°C lower than in the previous year.

4. OCEANOGRAPHIC CONDITIONS IN THE VICINITY OF THE SUB-ARTIC BOUNDARY

Water with temperatures around 7°-10°C and a comparatively steep temperature gradient was found at the 10 m level in mid-June and early July in the vicinity of 42°N-170°E. At 100 m, water with temperatures around 4°-8°C appeared in mid-June around 42°N.

According to Kitano (1966), a comparison of the water temperature distribution in this area with that at the 100 m level in 1958 shows no great difference. However, as compared with 1963, the temperature difference at the current boundary in 1966 was more pronounced and its position is thought to have been somewhat to the south.
Figure 1  Temperature at 10 meter depth, May 20-31, 1964 and 1965.

Figure 2  Temperature at 10 meter depth, June 1-10, 1964 and 1965.
Figure 3 Temperature at 10 meter depth June 11-20.

1964 and 1965
Figure 4: Temperature at 10 meter depth, June 21~30, 1964 and 1965.
Figure 5, Temperature at 10 meter depth July 1-10, 1964 and 1965.
Figure 6. Temperature at 10 meter depth, July 11-20, 1964 and 1965.
Figure 7. Temperature at 10 meter depth, July 21-30, 1964 and 1965 (5-14)
Figure 8. Temperature at 100 meter depth, May 20-31, 1964 and 1965.
Figure 9. Temperature at 100 meter depth.

June 1-10, 1964 and 1965.

(10-20)
Figure 10, Temperature at 100 meter depth.

Figure 11. Temperature at 100 meter depth.

Figure 12, Temperature at 100 meter depth.
July 1-10, 1964 and 1965.
Figure 13. Temperature at 100 meter depth, July 11-20, 1964 and 1965.
Figure 14. Temperature at 100 meter depth, July 21-30, 1964 and 1965.
Outline of sea conditions in the northern waters, May-July, 1966.
(Preliminary report mainly based on the water temperature reports)

1966年10月
October 1966

水産庁
Fisheries Agency of Japan
1966年5月〜7月の北洋観測観察
（主として水温観測資料による）

【中間報告】

北野 青光

§1 まえがき

サケマスの物質栄養事象として重要な水温の観測値は、1966年5月から7月迄の観測期間中、サケマス母船、独航船、観察船、北丸駆逐山丸、若朝丸、摩紀丸、第2熱木丸および北大鷹観船、おしよ丸、北星丸より予め定められた体制に従って報告されている。

本文は主として現在迄入手できた水温資料に基づき、1966年度のサケマス母船観察海域および関連海域の水況の状態について述べたものである。水温値は観測記録方式はパラメータ記録により得られたもので一部は未更正のものも含まれている。

第1図より第4図迄の図面は、各旬毎に実測で示したノルブ層およびノルブ層の水温分布図で、比較検討のため1965年同期の等温線分布を点線で示している。

§2 アラスカ海域南部近傍の水況

アリューシャン列島南側を西進するアラスカ海域南部近傍の水況は
例年5月下旬にノルブ層が下部に対称の水帯となり、旬を追って次第に昇温している。1966年度の昇温の度合は50°N、170°E

（）
附近的海域で5月下旬に3°〜4℃前後、6月中旬に5℃。7月上旬に6°〜7℃前後、7月下旬に8°〜9℃前後と変化次第に増減している。年間の晩季を季節同様に比較すると全体として大きな変化はみられないとアラスカ海流脈動を東方へextendする冷水帯の伸長の傾向が現象観測にみられる。

100 m層の水温水温分布はDichothermal layerの水温分布とよくたPhaseを示している。四℃Cの水温のひろがりはアラスカ海流脈動のひろがりの範囲を比較的よく示している。四℃Cの水温は5月下旬から6月下旬の間にノ80°以西の海域にはみられず、7月上旬および7月下旬に50°N、ノ70°E附近の海域にわずかにみられるにすぎない。全体としてみると1966年以前には四℃Cの水温がノ80°以東におさえられていた。同年同月には局地的であるがノ70°E〜ノ80°Eの海域にみられており、1963年はノ70°E以西の海域に延長していた。従って四℃Cの水温は1965年および1966年より更に東方の海域に、1963年よりは著しく東方海域に限定されている。

これは昨年よりDichothermal waterの発達が著しく、水温水温によるアラスカ海流脈動の増減が観測に進行したためか又はアラスカ海流脈動の西方海域へのtransport rateが小さいていたためであろう。

1966年にはアラスカ海流脈動の傾向を東方へ伸長する2℃C前後の冷水帯のextendするか速かであるか同様傾向は100 m層にもみられる。
8 3  ベーリング海の気況

10 m層で6月下旬および7月上旬に5° ～ 6° C前後の水温がみられた。断片的な資料に基づいているため詳細は不明であるが、5° ～ 6° C前後の水温が観測され、これより上層において大きな変化はみられていません。

一方、100 m層の水温分布では、全体として2° ～ 3° C前後の水温が観測され、同様に年と比較すると1° C内外の低差がみられた。

8 4  亜寒帯境界付近の気況

10 m層で比較的水温上昇の急な6° ～ 10° C前後の水温が6月中旬および7月上旬にみられ、170°E付近の海域にみられた。100 m層では6月中旬に4° ～ 8° C前後の水温が観測され、これより上層において大きな変化はみられなかった。

Kitano（1966）によると、この海域の水温分布は1958年の10m層の水温分布と比較して大きな変化はみられない。しかし、1963年と比較すると1966年には破壊の水温差がより顕著になり、且その位置は若干前後しているのではないかと思われる。
Figure 1 Temperature at 10 meter depth, May 20-31, 1964 and 1965.

Figure 2 Temperature at 10 meter depth, June 1-10, 1964 and 1965.
Figure 3. Temperature at 10 meter depth June 11-20, 1964 and 1965.
Figure 4. Temperature at 10 meter depth, June 21-30, 1964 and 1965.
Figure 5. Temperature at 10 meter depth July 1-10, 1964 and 1965.
Figure 6, Temperature at 10 meter depth, July 11-20,
1964 and 1965.
(13-18)
Figure 7. Temperature at 10 meter depth, July 21~30,
1964 and 1965 (18-4)
Figure 8. Temperature at 100 meter depth, May 20-31, 1964 and 1965.
Figure 9. Temperature at 100 meter depth.

June 1-10, 1964 and 1965.
Figure 10, Temperature at 100 meter depth,

Figure 11. Temperature at 100 meter depth.
Figure 12, Temperature at 100 meter depth, July 1~10, 1964 and 1965.
Figure 13. Temperature at 100 meter depth, July 11-20, 1964 and 1965.
Figure 14. Temperature at 100 meter depth, July 21-30, 1964 and 1965.