Update on assessing the Japanese wartime hydrographic survey

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Background

> Limited time period, but wide coverage and high density

- 1. Fishery Institutions seas near Japan (1920s-1930s)
- 2. Imperial Navy western North Pacific (late 1930s-1944)



Questions

- Very poor metadata How did they measure?
 - \checkmark Ship position
 - ✓ Sampling depth
 - ✓ Sampling bottles
 - ✓ Thermometers
- Unclear data flow Do we share the same data?

Most Japanese wartime data (T-profiles) was sent to US by 1960, namely before NODC was established. JODC started in 1965.

This talk follows

"Japanese hydrographic survey during the WW2 - a very unsatisfactory archeology –" in GSOP workshop @Hobart, July 2013
"Progress on assessing the Japanese wartime hydrographic survey" in 3rd CLIVAR GSOP IQuOD Workshop @Hamburg, Nov. 2015

Unclear data flow How did NODC acquire those data? Do we share the same data?



Extensive post-war survey by US team (targeted many aspects of Japanese systems, including hydrography and oceanography, led by Washington Document Center, 1945-46, incl. literature hunting & interviews)

Soon transferred to US, and distributed.



Documents tell that copies were made before US collected the data.

小路零報分号(路到年9月 海軍時代の水路部海洋調査業務

"Hydrographic surveys conducted by Hydrographic Department under naval control.", Kishi, S. (this title is made by my quick translation, not official) – fully in Japanese, consisting of #1-#4 articles.

は容易なことではなかった。水路部沿革史第四巻(昭 和26年発行)には、水路部は終戦処理に当って、借し いことに資料の大半を焼却したというふうに否いてあ るが、実際にこのようなことがあろうはずはなく、第 五課で保管していた観測資料一そろいはそっくりその まま、現在もなお水路部に保管されている。終戦に際 して、第五課では観測資料をなんとかして進駐軍の押 収からのがれようと、ひそかにその保全策を詳じたわ けで、終敬の際の審類焼却は、重要資料保全のための 一つの手段に過ぎなかったわけである。 "The official chronicle of HD (v4, 1951) states that most of the data/reports were incinerated in the post-war processing, but it's not true. Actually, a set of data sheets that had been stored by competent #5 Division are still kept in HD, as a result of copying effort and camouflage to avoid requisition by the Allies. "

Note: Treaty of San Francisco was signed on Sep 8, 1951, and came into force on Apr. 28, 1952.

Typical example of data sheet in JP Hydrographic Reports

(taken in 1942 by Ryofu Maru =JMA ship)

Published in 1963

1963年来57

Depth (m)

0

10

Oceanography 7 (0404) (0400) $\frac{1}{4}$ (0401) (0402)6 (0403) 5 3 (0398) 2 (0399) 1 7 - 3 7 - 2 7 - 2 7 - 1 7 - 2 7 - 3 7 - 1 0730 - 0900 1735 - 1920 0846 - 1105 1740 - 1940 0325 - 0440 1105 - 1220 1930 - 2130 44 ~ 50N - 29N 44 - 18N 45 46 - 04N 43 - 47N 43 14N 42 - 401 -150 - 00E 151 - 52E 153 - 35E 147 - 42E 148 - 45E 145 - 30E 146 - 36E T("C) S(%) T(°C) | S(%) T(°C) S(‰) T(*C) : S(%) T(°C) | S(%) T(°C) \$(%。 T(°C) S(%0) 5.23 32.85 7.60 32.83 6.56 33.01 6,07 32.57 8,32 32.66 9.46 32.45 32.61 0.65 6.03 32.99 4.17 32.83 7,56 32.72 4,54 32.52 7.21 32.96 8.43 32.57 8.38 32.74 7.13 32.72 4.50 33.06 1.66 32.94 4.44 32.95 3.62 32.79 2.11 32.74 5.16 32.77 2.27 33.12 1.10 32.88 1.68 33.06 2.96 32.95 0.94 32.97 2.40 32,90 1,85 32,92 0.79 33.26 0.63 33.04 0.93 33.09 0.68 32.92 0.86 33.11 1.20 33.04 1.38 33.12 0.65 33.13 0.66 33.12 0.56 33.18 0.76 33.33 0.68 33.12 0.67 33.19 0.85 33.19 0.41 33.12 0.76 33.33 0.80 33.34 0.79 33.24 0.49 33.17 0.47 33.19 0.72 33.21 0.80 33.35 0.55 33.22 1.20 33.29 1.47 33.44 0.66 33.21 0.53 33.24 3.06 33.33 0.86 33.37 0.78 33.31 2.10 33.46 2.27 33.59 1.10 33.31 1.55 33.54 0.98 33.30 1.35 33.40 2.63 33.81 2,98 33,90 1.01 33.40 2.23 33.56 1.25 33.53 2.57 33.85 3.15 34.02 3.22 34.02 1,66 33,51 2.83 33.85 2.25 33.80 2,98 33.91 3,06 3.20 34.12 2.00 33.61 33.93 3.10 34.17 34.142.83+33.95 3.13 2.92 34.19 2,42 33,79 3.05 34.12 3.10 34.26 3.05 34.18 3.05+34.13 2,92 34,30 3.10 34.18 2,85 34.43 2.40 34.33 <u>2.87</u> 34.31 2.95+34.41 2.59 34.43 3.09 34.33 2.50 34.47 2.03 34.41 2.65 34.42 2.70 34.42 2.35 34.52 2.83 34.36 2.31 34.51 2.31 34.45 2.44 34.52 777.57 6 3 3 6 8 15 8 15

All are "standard-level" (or targeted) depth data.

All wartime data published in JP Hydrographic Reports are like this, with no exception. Likewise in WOD, too.



Not sure how they are realized in the scene.

But there were targeted depths widely notified.



Use reversing bottles for water sampling, but don't attach more than 2.

Typical example of data sheet in JP Hydrographic Reports

taken in 1960, published in 1964



SOS年海募撤制成果 (1965年教行)

※1959年為5の資料でも同じ時玩

Both of "observed" and "interpolated" depth data are given.

All data reports on post-WW2 survey are given in this format, even for those published <u>before</u> the wartime reports.



図 8-18 御前崎南微東の水温鉛直断面分布と黒潮との関係 (1931 年 8 月 17-19 日). 岸人 (1931c, 第 2 図A) による.

故に近来は水圧によって水深を指示する不防圧寒暖計[被圧温度計]を使 用して深さを check する方法が行はれて居るが,我が測量艦に於いては之を 使用してゐない.其の理由は測量船が帆船又は単螺旋の船或は機械の前進後 進停止を頻繁に行ひ得ざる内燃機械を装備して居る船等では船の操縦によっ て鋼線[鋼索]を垂直[鉛直]にすることが出来ないから,不防圧寒暖計の 使用は絶対的に必要であるが,我が測量艦の如く双螺旋の船では艦の操縦に 依って懸吊鋼線を垂直にすることは容易であるから不防圧寒暖計の使用は先 づ必要がない.寧ろ普通の顛倒式寒暖計[防圧温度計]を2本装備すること に依って正確なる温度を測定する方が優って居るのである.

Cited from Kawai (1997)

Meridional cross-section of temperature, south of Honshu (Kishindo, 1931)

All dots are plotted on standard depths.

"Recently, people often use unprotected thermometers to deduce depth, but we don't use them on our survey ships because we can easily keep wire vertical by controlling the ships by their twinscrew propellers. Rather, juxtaposing

> two protected reversing thermometers is more important to ensure accurate measurements of temperature." (<u>Kishindo</u>, 1931)

Captain of *Komahashi* (survey ship), Manager of HD #5 Division, and later Rear-Admiral, Dr. Sci.

"On the recent change of Kuroshio" 第九去 Dedicated to Imperial Household Agency, No.6, July 10, 1943. 远率ニ於ケル 黒潮, 靈化二就テ 水路 部



"On the recent change of Kuroshio" Dedicated to Imperial Household Agency, No.6, July 10, 1943.





Reported depth – Assumed target depth for #4 Kaiyo (-Maru), 1949-1953



Reported depth – Assumed target depth for #5 Kaiyo (-Maru), 1952



Instruments









Summary

(still unclear, inconsistent, more evidence wanted)

- Separate data flows <- copy was made before collection by US
- Why only standard depth? Maybe targeted, but how? Still unclear.
 - Very poor information. We have data, but without documentation.
 Living memory is no longer available.
 - All wartime data found in published "Hydrographic Reports" are given only in "standard-level" format. There are even no columns for wire length or angle.
 - Post-WW2 data were given in "observed & interpolated" format, even for those published before the wartime data. So, there must be enough background to keep original depth data.

Correction is not easy (maybe impossible), but some uncertainty estimate might be assigned.

Can change any view on decadal change? Might be yes, at least hypothetically.



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Thank you.

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