(1958), Cochrane (1958), and Pollak (1958) still stand, but I believe that their classes are too large. One can see that by merging the present classes into divisions as large as 0.5‰ of salinity, as Cochrane and Pollak have done, or 1.0‰, as Montgomery has done, the high-volume warm prongs (figure 2.9) would be artificially blurred and merged with one another.

One or two colleagues have asked whether I could not use a logarithmic volume scale in such presentations as figures 2.2–2.5 so that the warm water masses (if included) could be made to stand out more clearly, but one of the principal virtues of the volumetric *T–S* diagram is that it displays the relative abundances of the water masses as they actually exist. The *concentration* of water in the most abundant North Pacific class exceeds that in the warm-water prongs (shown in figure 2.9) by a ratio of about 25,973 to 10 or less. This is analogous to comparing the elevation of Mount Everest to that of Water Street, Woods Hole, near the original building of the Woods Hole Oceanographic Institution. In fact, if we were able to sample and measure salinity more perfectly, the apparent elevations shown in the deep water in figure 2.8 would probably be even higher.

The feelings I have about the census are compounded equally of fascination and frustration. The frustration is the result of the decrease in the rate of acquisition of new high-quality data. This decrease is due in part to the trends in modern physical oceanography in which the dramatic improvements in direct current measurements have understandably taken priority over routine measurements of water properties on a large scale. It is also clear that there is a long delay (as much as 5 years) between the time hydrographic data are obtained at sea and the time these data become available on tape from the National Oceanographic Data Center (in part because some investigators take a long time to turn their data in to the Data Center). I have been reluctant to obtain new data informally, from friendly colleagues, however, because I do not think that the Data Center should be bypassed at present; its function would be impaired if data were only exchanged between a cabal of skilled observers.

The fascination results from the precise but peculiar way in which the water masses of the oceans are arranged—particularly the deep water masses that make up the greater part of the oceans. Why, for instance, are the big, exclusive North Pacific classes fresher than existing circumpolar and South Pacific waters? Are they fossil water masses that were formed in some past millennium when the oceans were somewhat fresher, or are they still undergoing a change toward the fresher as the result of slow vertical mixing (across density surfaces) with the still fresher water that lies above them at the present time? I do not think that we can supply answers to such questions at present, and answers will not be available even in the future without painstaking observations. There are indications this style of observations may be coming back into vogue. The authorless Scripps data report of the INDOPAC expedition (Scripps Institution of Oceanography Reference: 78-21) is an excellent example. It should be worthwhile to reactivate this census (which was closed as of June 1977) when more high-quality data of this kind are available from NODC, and I shall probably propose to do so at some time in the future.

2.4 The Formation of Water Masses

There is only one hypothesis about water-mass formation that is universally agreed upon, that is, that the cold, dense water that fills the great ocean basins has been formed at high latitudes. The manner in which the thermocline–halocline is formed is under dispute, and there are almost as many notions of the *rate* at which all the various water masses are formed as there are investigators.

Given the extraordinary regularity of the *T–S* curves that are found in much of the oceans, it is natural to assume that these curves are the result of vertical mixing between two end water masses. Very simply stated, this assumption implies that the bottom water (as all agree) has been formed at high latitudes, that the surface water at middle and low latitudes has received its *T–S* characteristics from the atmosphere by the uneven processes of evaporation and heating, and that the remainder of the water column is a mixture of surface and bottom water. Wüst (1935) clearly recognized that this was an oversimplification, and his use of the "core-layer" method reflects his conviction that different water masses can be traced to a small number of more-or-less point sources at the sea surface over a wide range of latitude.

The notion that *all* the thermocline water masses can be traced to the sea surface is generally attributed to Iselin (1939a). He constructed a *T–S* diagram from winter observations at the surface of the western North Atlantic, and found that it corresponded closely to the *T–S* diagram obtained from a typical hydrographic station in that ocean. It is worth noting that Wüst (1935, p. 3) anticipated Iselin (in the South Atlantic) by 4 years. He wrote, "The vertical structure of the Subantarctic Intermediate Water, with its horizontal spreading at depths, is analogous to a vertical figure of the horizontal arrangement of temperature and salinity at the surface of the formation region." Wüst did not dwell on this subject further, and it is clear that he regarded core layers as more important as indices of ocean circulation.

In his 1939a paper, Iselin stressed "lateral mixing" as responsible for the *T–S* curve in the western North Atlantic. Sverdrup, in chapter XV of *The Oceans* (Sverdrup, Johnson, and Fleming, 1942) amplified Iselin's concept; he suggested that "subtropical convergences" were the dominant source of the waters in the thermocline-halocline. In these convergences, according to Sverdrup, surface water sinks, in late winter, over a wide range of latitude. He compared late-winter, sea-surface T-S points to the T-S curves obtained from subsurface hydrographic data and found a close correspondence in the south Indian Ocean, the eastern and western South Pacific, and the western North Pacific, just as Iselin (1939a) had done for the North Atlantic.

In this type of water-mass formation, very little change takes place in each individual water type—when 10°C water outcrops at the sea surface, it sinks again at 10°C or nearly so, not at 4°C. In vertical-mixing models, the water types are constantly changing. In the most violent of these, Stommel (1958) held that bottom water was produced at two sinks, the Weddell Sea in the south and the Irminger Sea in the north. He theorized that bottom water was produced constantly and moved upward through the thermocline. The thermocline in this theory was maintained by a downward diffusion of heat that balanced the upward advection of cold bottom water. Later, Stommel and Arons (1960b) produced a simple schematic model in which $20 \times 10^6\ m^3\,s^{-1}$ was formed in each sink and flowed equatorward in the form of deep western boundary currents. Subsequently, this water upwelled through the thermocline (as outlined in Stommel's earlier paper) with an upward velocity of about $4\ m\,yr^{-1}$.

Cooper (1955a) refocused attention on the Norwegian Sea overflows as a source of the North Atlantic Deep Water, and this paper touched off a series of investigations into these overflows, using newly developed methods of direct current measurement such as the Swallow float (Swallow, 1955), I (1970) have summarized some of the earlier investigations (see also chapter 1, this volume). In essence, it was evident that if cold bottom water does in fact flow across the sills of the Norwegian Sea into the deep Atlantic Ocean, relatively warm surface water must be drawn into the Norwegian Sea to replace it. It was possible to write water and heat budgets for the Norwegian Sea; the cold outflows ($9 \times 10^6\ m^3\,s^{-1}$) transported 63×10^{12} less calories per second than the warm inflows (also $9 \times 10^6\ m^3\,s^{-1}$). This excess heat must go to the atmosphere, and the calculated heat loss from the oceanographic data, $75\ kcal\,cm^{-2}\,yr^{-1}$, corresponded pretty well with Budyko's (1963) calculated heat loss from meteorological data—about $60\ kcal\,cm^{-2}\,yr^{-1}$.

Of the $9 \times 10^6\ m^3\,s^{-1}$ of cold water flowing out of the Norwegian Sea, $3 \times 10^6\ m^3\,s^{-1}$ is embodied in the shallow, fresh East Greenland Current. The remaining $6 \times 10^6\ m^3\,s^{-1}$ is dense overflow water; the overflows entrain a further $4 \times 10^6\ m^3\,s^{-1}$ of Atlantic water at their sills and a total of $10 \times 10^6\ m^3\,s^{-1}$ flows southward along the western side of the North Atlantic as a narrow deep western boundary current. The fact that this current originates in the Norwegian Sea and not in the Irminger Sea does not affect the theory, but it is naturally of vital interest to the descriptive oceanographer.

Thus the formation of North Atlantic Deep Water follows a classic pattern—cold, dense water is formed at high latitudes, and warm surface water flows poleward to replace it. In this pattern, the process of water-mass formation changes the water characteristics radically. Much of the replacement water must come from the tropical South Atlantic since the North Atlantic Deep Water flows into the South Atlantic at a rate of $9 \times 10^6\ m^3\,s^{-1}$ according to Sverdrup et al. (1942), or $7 \times 10^6\ m^3\,s^{-1}$ according to my box model (Worthington, 1976, figure 11). As this tropical surface water flows north, it gradually transfers heat to the atmosphere and undergoes enormous changes in its T-S characteristics before it finally becomes North Atlantic Deep Water.

This pattern is clearly consistent with the Stommel (1958) theory since upwelling of the North Atlantic Deep Water must take place—provided that the volume of the North Atlantic Deep Water remains constant. One could conceive of a water mass that refuses to mix with its neighbors—in this case the Antarctic Intermediate Water, the Circumpolar Deep Water, and the Antarctic Bottom Water—but, instead, pushes them bodily aside, preserving the purity of its original T-S characteristics and increasing its own territory. In the case of the North Atlantic Deep Water, it seems unlikely that such behavior has taken place. The area of the Atlantic Ocean is $82.4 \times 10^6\ km^2$. The North Atlantic Deep Water is found throughout two-thirds of this area. Its volume is $89 \times 10^6\ km^3$—$62 \times 10^6\ km^3$ in the North Atlantic according to Wright and Worthington (1970) by their definition, and the remaining $27 \times 10^6\ km^3$ in the South Atlantic according to this census (same definition). The mean thickness of the North Atlantic Deep Water is thus about 1500 m. The width of the South Atlantic at the southern limit of more or less pure North Atlantic Deep Water (35°S) is 6400 km. To advance 1° of latitude (110 km) southward, the North Atlantic Deep Water would have to increase in volume by $1.06 \times 10^6\ km^3$. If $7 \times 10^6\ m^3\,s^{-1}$ cross the equator, as I have suggested, this flux should result in an advance of 1° of latitude every 4.5 years if no upwelling were taking place. Since the *Meteor* expedition was made, over 50 years ago, the southern limit of the North Atlantic Deep Water would have had to advance 11° of latitude; it plainly has not done so. We should, however, be cautious even in crude calculations like these, since our numbers for the amount of water formed may not be even approximately correct. For example, most of the measurements made in the deep, dense overflows from the Norwegian Sea were made in the 1960s—a cold decade in the northern North Atlantic relative to the decades that preceded it (Colebrook, 1976). This could easily have resulted in an overestimation of the climatic mean flow of the dense overflows.

We should probably not regard the Iselin (1939a) theory of the thermocline-halocline formation as exclusive of the Stommel (1958) theory, or vice versa. The evidence that water sinks along density surfaces that have outcropped at the sea surface seems inescapable, yet there is equally strong evidence that upwelling of deep water through the thermocline must take place, at least in the Atlantic.

Recently (Worthington, 1977a), I have questioned the Stommel-Arons (1960b) model as it applies to the Pacific Ocean. The argument is a simple one; the deep water in the Pacific contains not less than 7 g of dissolved silicon per cubic meter, and the upper layers are very nearly silicon-free. If the deep water (formed in the Weddell Sea) upwells through the thermocline throughout the Pacific and flows southward in the upper layers, two processes must take place. First, the dissolved silicon must be removed from the deep water before it can return southward to the formation area, free of silicon. Second, an equal, or nearly equal, amount of silicon must be replaced before the surface water sinks below 2000 m in the Weddell Sea. The removal and replacement rate necessary to accommodate the model can be calculated to be about 30×10^{14} g of silicon per year. I believe that to ask the ocean to perform feats like this is unreasonable and that the most logical conclusion to be drawn is that the deep waters in the Pacific are not being renewed at the present time. One could guess that they might not be renewed until the time when the rate of accumulation of ice on the Antarctic continent begins to exceed that of ablation and runoff.

The *surface* waters around Antarctica are fairly rich in silicon, as are those of the northern North Pacific. Reid (1973b) has attributed this situation in the North Pacific to upwelling, and this also is the most reasonable explanation for the state of affairs around Antarctica. Nutrient-rich upwelled water, augmented by runoff from Antarctica, flows equatorward until the amount of sunlight is sufficient to cause photosynthesis; then the silicon (and other nutrients) is immediately used for plant growth—consistent with the rich biota in the zone around Antarctica and with the high rate of accumulation of siliceous sediments beneath this zone (Lisitzin, 1972).

By comparison, the North Atlantic surface waters (except in the coastal zones) are a desert because they consist of nutrient-stripped water from the middle and low latitudes, and Metcalf (1969) has shown that newly formed North Atlantic Deep Water is also silicon poor. The subject clearly invites further investigation, but, as a first approximation, one might suppose that in silicon-poor oceans such as the Atlantic, the Stommel (1958) theory holds true, but in silicon-rich oceans, such as the Pacific and Indian Oceans, the process of deep-water formation has been suspended and the Stommel mechanism awaits application for the next cold, climatic variation in the southern hemisphere. If such a cold variation should take place, and if the vast store of nutrients that has (I believe) been accumulating in the deep Pacific through the years should be brought up into the sunlight, the results, in terms of biological productivity, might be staggering.

If this hypothesis is even approximately correct, we are faced with the problem of how the thermocline-halocline is maintained in the Pacific and Indian Oceans. A clue to this has been provided by McCartney (1977). He has identified a family of water types in the South Atlantic, South Pacific, and Indian Oceans that he has termed Subantarctic Mode Water. These layers appear to originate by deep convective overturning immediately equatorward of the Antarctic Circumpolar Current. They can be identified at great distances from their formation regions by thermostads with *T–S* characteristics identical to those of the deep overturned waters, and usually by an oxygen maximum in these thermostads. These layers are strongly reminiscent of the 18°-Water thermostad formed south of the Gulf Stream (Worthington, 1959) and of the Subtropical Mode Water (Masuzawa, 1969) south of the Kuroshio and the Kuroshio Extension. They differ from 18° Water and the Subtropical Mode Water in that they are found at much greater distances (up to 3000 km) from their points of origin and that they occur over a wider range of temperature (14–4°C).

Although the matter is still under investigation (McCartney, 1980), it appears that most of the southern hemisphere thermocline waters (in terms of volume) originate in these thermostadal layers by means of convective overturn. Certainly, all the southern, high-volume classes between 4 and 14°C that appear at the base of the central prong in figure 2.9 can be traced to the deep mixed layers described by McCartney (1977).

Water-mass formation is a complicated process. There seems to have been no major hypothesis on the subject that can be entirely accepted or entirely rejected. The earth's geography and the atmospheric circulation encourage the production of a wild variety of water masses, and evidently these water masses are formed in a number of different ways. I have attempted to describe some of these. The study of water-mass formation is intimately tied to the study of the general ocean circulation. The most promising method for the future will be to combine these two studies by means of direct current measurements and the rigorous observation of the distribution of variables in the oceans and of the atmospheric processes that bring about these distributions.

Appendix: Census of World-Ocean Water Masses with Division by Bivariate (°C × ‰) Classes and Rank by Volume

Rank	T°	S, ‰	Volume	Total Volume	N. Pac.	S. Pac.	So. O. Pac.	Ind.	So. O. Ind.	N. Atl.	S. Atl.	So. O. Atl.
1	1.1- 1.2	34.68-34.69	25,973	25,973	100	-	-	-	-	-	-	-
2	1.2- 1.3	34.67-34.68	14,010	39,983	100	-	-	-	-	-	-	-
3	0.7- 0.8	34.71-34.72	13,571	53,554	-	48	9	35	5	-	2	1
4	1.2- 1.3	34.68-34.69	13,494	67,048	91	9	-	-	-	-	-	-
5	1.1- 1.2	34.69-34.70	12,905	79,953	82	18	-	-	-	-	-	-
6	1.0- 1.1	34.69-34.70	11,988	91,941	95	5	-	-	-	-	-	-
7	0.6- 0.7	34.71-34.72	11,930	103,871	-	55	12	24	6	-	2	1
8	1.5- 1.6	34.68-34.69	10,337	114,208	5	95	-	-	-	-	-	-
9	1.3- 1.4	34.67-34.68	9,826	124,034	99	1	-	-	-	-	-	-
10	0.8- 0.9	34.71-34.72	9,607	133,641	-	52	8	34	3	-	2	1
11	1.0- 1.1	34.72-34.73	9,252	142,893	-	24	9	63	2	-	1	1
12	1.6- 1.7	34.67-34.68	8,836	151,729	16	84	-	-	-	-	-	-
13	1.5- 1.6	34.67-34.68	7,881	159,610	22	78	-	-	-	-	-	-
14	0.9- 1.0	34.72-34.73	7,618	167,228	-	26	15	49	7	-	2	1
15	1.4- 1.5	34.67-34.68	7,027	174,255	49	51	-	-	-	-	-	-
16	1.6- 1.7	34.66-34.67	6,627	180,882	23	77	-	-	-	-	-	-
17	0.8- 0.9	34.72-34.73	6,487	187,369	-	28	17	40	11	-	3	1
18	0.9- 1.0	34.70-34.71	6,434	193,803	68	28	-	2	1	-	-	1
19	1.3- 1.4	34.73-34.74	6,387	200,190	-	10	9	78	2	-	-	1
20	1.3- 1.4	34.66-34.67	6,052	206,242	100	-	-	-	-	-	-	-
21	1.4- 1.5	34.73-34.74	6,030	212,272	-	10	7	81	2	-	-	-
22	1.1- 1.2	34.67-34.68	6,024	218,296	100	-	-	-	-	-	-	-
23	1.0- 1.1	34.68-34.69	5,844	224,140	100	-	-	-	-	-	-	-
24	0.5- 0.6	34.71-34.72	5,676	229,816	-	29	40	21	6	-	3	1
25	1.1- 1.2	34.72-34.73	5,497	235,313	-	23	12	61	1	-	1	2
26	1.3- 1.4	34.68-34.69	5,473	240,786	38	62	-	-	-	-	-	-
27	0.9- 1.0	34.71-34.72	5,382	246,168	-	60	9	27	1	-	2	1
28	1.2- 1.3	34.73-34.74	5,328	251,496	-	14	14	65	5	-	1	1
29	1.4- 1.5	34.69-34.70	5,322	256,818	-	100	-	-	-	-	-	-
30	1.4- 1.5	34.66-34.67	5,301	262,119	100	-	-	-	-	-	-	-
31	1.7- 1.8	34.66-34.67	5,065	267,184	19	80	-	-	1	-	-	-
32	0.4- 0.5	34.70-34.71	4,906	272,090	-	28	27	21	15	-	5	4
33	1.7- 1.8	34.65-34.66	4,844	276,934	34	65	-	-	1	-	-	-
34	1.4- 1.5	34.68-34.69	4,760	281,694	4	96	-	-	-	-	-	-
35	1.9- 2.0	34.88-34.89	4,659	286,353	-	-	-	-	-	19	81	-
36	1.5- 1.6	34.73-34.74	4,640	290,993	-	11	8	78	3	-	-	-
37	1.5- 1.6	34.74-34.75	4,550	295,543	-	11	10	72	7	-	-	-
38	1.1- 1.2	34.73-34.74	4,471	300,014	-	16	17	52	12	-	3	-
39	1.0- 1.1	34.70-34.71	4,384	304,398	58	39	1	-	-	-	-	2
40	1.5- 1.6	34.66-34.67	4,349	308,747	74	26	-	-	-	-	-	-
41	1.4- 1.5	34.74-34.75	4,337	313,084	-	12	11	65	11	-	1	-
42	0.5- 0.6	34.70-34.71	4,134	317,218	-	25	21	29	16	-	5	4
43	1.4- 1.5	34.65-34.66	4,065	321,283	100	-	-	-	-	-	-	-
44	1.2- 1.3	34.69-34.70	4,048	325,331	34	64	1	-	1	-	-	-
45	1.1- 1.2	34.70-34.71	3,843	329,174	53	44	1	-	1	-	-	1
46	1.3- 1.4	34.69-34.70	3,801	332,975	-	100	-	-	-	-	-	-
47	2.0- 2.2	34.89-34.90	7,579	340,554	-	-	-	-	-	21	79	-
48	1.2- 1.3	34.66-34.67	3,717	344,271	100	-	-	-	-	-	-	-
49	1.2- 1.3	34.72-34.73	3,655	347,926	-	20	14	62	1	-	1	2
50	1.0- 1.1	34.71-34.72	3,621	351,547	-	71	9	15	2	-	1	2
51	1.8- 1.9	34.64-34.65	3,566	355,113	43	56	1	-	-	-	-	-
52	1.6- 1.7	34.73-34.74	3,536	358,649	-	15	10	72	3	-	-	-
53	1.6- 1.7	34.74-34.75	3,504	362,153	-	12	10	72	6	-	-	-
54	1.0- 1.1	34.73-34.74	3,465	365,618	-	11	21	45	17	-	6	-
55	1.8- 1.9	34.65-34.66	3,404	369,022	14	85	1	-	-	-	-	-
56	1.5- 1.6	34.69-34.70	3,371	372,393	-	98	1	-	-	-	-	1
57	0.7- 0.8	34.72-34.73	3,330	375,723	-	9	22	52	11	-	6	-
58	1.7- 1.8	34.74-34.75	3,239	378,962	-	14	8	69	9	-	-	-
59	1.8- 1.9	34.66-34.67	3,211	382,173	13	85	1	-	1	-	-	-
60	1.3- 1.4	34.74-34.75	3,205	385,378	-	15	13	51	19	-	2	-
61	1.9- 2.0	34.89-34.90	3,141	388,519	-	-	-	-	-	85	15	-
62	1.4- 1.5	34.64-34.65	3,128	391,647	100	-	-	-	-	-	-	-
63	1.9- 2.0	34.64-34.65	3,064	394,711	24	74	1	-	1	-	-	-
64	1.3- 1.4	34.65-34.66	3,040	397,751	100	-	-	-	-	-	-	-
65	2.0- 2.2	34.90-34.91	5,958	403,709	-	-	-	-	-	75	25	-
66	1.7- 1.8	34.67-34.68	2,957	406,666	4	95	-	-	1	-	-	-
67	1.5- 1.6	34.64-34.65	2,896	409,562	100	-	-	-	-	-	-	-
68	0.9- 1.0	34.69-34.70	2,886	412,448	97	-	-	-	1	-	-	2

Rank	T°	S, ‰	Volume	Total Volume	N. Pac.	S. Pac.	So. O. Pac.	Ind.	So. O. Ind.	N. Atl.	S. Atl.	So. O. Atl.
69	1.5- 1.6	34.65-34.66	2,864	415,312	100	-	-	-	-	-	-	-
70	0.3- 0.4	34.70-34.71	2,829	418,141	-	21	37	14	17	-	8	3
71	1.5- 1.6	34.63-34.64	2,796	420,937	100	-	-	-	-	-	-	-
72	1.9- 2.0	34.65-34.66	2,708	423,645	15	83	1	-	1	-	-	-
73	1.6- 1.7	34.65-34.66	2,707	426,352	86	14	-	-	-	-	-	-
74	1.7- 1.8	34.73-34.74	2,698	429,050	-	14	12	67	7	-	-	-
75	-0.2--0.1	34.67-34.68	2,630	431,680	-	-	2	7	25	-	47	19
76	1.6- 1.7	34.68-34.69	2,609	434,289	-	98	1	-	-	-	-	1
77	2.0- 2.2	34.63-34.64	5,106	439,395	25	69	3	1	1	-	-	1
78	0.0- 0.1	34.68-34.69	2,485	441,880	-	-	4	10	49	-	21	16
79	1.8- 1.9	34.74-34.75	2,452	444,332	-	14	7	66	13	-	-	-
80	0.2- 0.3	34.69-34.70	2,449	446,781	-	-	16	17	44	-	15	8
81	1.9- 2.0	34.63-34.64	2,413	449,194	38	59	1	-	1	-	1	-
82	2.2- 2.4	34.92-34.93	4,788	453,982	-	-	-	-	-	89	11	-
83	2.2- 2.4	34.91-34.92	4,730	458,712	-	-	-	-	-	47	53	-
84	0.2- 0.3	34.70-34.71	2,361	461,073	-	23	50	6	2	-	19	-
85	1.8- 1.9	34.73-34.74	2,358	463,431	-	15	10	66	9	-	-	-
86	2.0- 2.2	34.91-34.92	4,671	468,102	-	-	-	-	-	95	5	-
87	0.8- 0.9	34.70-34.71	2,322	470,424	31	54	5	5	3	-	-	2
88	1.3- 1.4	34.72-34.73	2,319	472,743	-	16	20	59	-	-	2	3
89	0.4- 0.5	34.71-34.72	2,304	475,047	-	24	42	24	3	-	6	1
90	2.0- 2.2	34.88-34.89	4,597	479,644	-	-	-	-	-	2	98	-
91	1.7- 1.8	34.75-34.76	2,268	481,912	-	2	2	82	14	-	-	-
92	0.3- 0.4	34.69-34.70	2,195	484,107	-	-	17	24	32	-	12	15
93	1.6- 1.7	34.64-34.65	2,159	486,266	99	-	-	-	-	-	-	1
94	0.6- 0.7	34.70-34.71	2,157	488,423	-	23	30	14	20	-	7	6
95	1.6- 1.7	34.75-34.76	2,152	490,575	-	-	5	75	20	-	-	-
96	-0.3--0.2	34.66-34.67	2,145	492,720	-	-	-	1	-	-	35	64
97	2.0- 2.2	34.64-34.65	4,246	496,966	14	78	4	1	2	-	-	1
98	1.2- 1.3	34.74-34.75	2,116	499,082	-	8	18	43	24	-	7	-
99	-0.6--0.5	34.65-34.66	2,060	501,142	-	-	-	-	-	-	-	100
100	-0.3--0.2	34.67-34.68	2,037	503,179	-	-	1	5	45	-	38	11
101	0.1- 0.2	34.69-34.70	2,036	505,215	-	-	17	17	38	-	25	3
102	1.9- 2.0	34.90-34.91	2,014	507,229	-	-	-	-	-	97	3	-
103	1.1- 1.2	34.71-34.72	1,986	509,215	-	71	10	14	3	-	-	2
104	1.6- 1.7	34.63-34.64	1,974	511,189	99	-	1	-	-	-	-	-
105	2.0- 2.2	34.62-34.63	3,928	515,117	26	68	3	1	2	-	-	-
106	-0.1- 0.0	34.67-34.68	1,911	517,028	-	-	2	6	25	-	36	31
107	1.2- 1.3	34.71-34.72	1,909	518,937	-	85	7	7	-	-	-	1
108	-0.1- 0.0	34.68-34.69	1,900	520,837	-	-	4	11	58	-	20	7
109	1.6- 1.7	34.62-34.63	1,859	522,696	100	-	-	-	-	-	-	-
110	1.9- 2.0	34.73-34.74	1,857	524,553	-	21	9	60	10	-	-	-
111	-0.5--0.4	34.65-34.66	1,848	526,401	-	-	-	-	-	-	1	99
112	2.4- 2.6	34.93-34.94	3,691	530,092	-	-	-	-	-	84	16	-
113	0.1- 0.2	34.68-34.69	1,844	531,936	-	-	6	11	39	-	17	27
114	1.3- 1.4	34.70-34.71	1,836	533,772	-	97	1	-	-	-	-	2
115	0.9- 1.0	34.73-34.74	1,794	535,566	-	9	22	41	17	-	11	-
116	2.4- 2.6	34.92-34.93	3,547	539,113	-	-	-	-	-	33	67	-
117	2.2- 2.4	34.90-34.91	3,518	542,631	-	-	-	-	-	15	85	-
118	1.9- 2.0	34.72-34.73	1,744	544,375	-	16	11	67	6	-	-	-
119	-0.7--0.6	34.65-34.66	1,727	546,102	-	-	-	-	-	-	-	100
120	2.2- 2.4	34.62-34.63	3,440	549,542	27	67	3	2	1	-	-	-
121	1.4- 1.5	34.70-34.71	1,715	551,257	-	96	2	-	-	-	-	2
122	2.2- 2.4	34.61-34.62	3,396	554,653	22	72	4	1	1	-	-	-
123	1.8- 1.9	34.88-34.89	1,671	556,324	-	-	-	-	-	81	19	-
124	0.1- 0.2	34.70-34.71	1,644	557,968	-	-	79	5	-	-	16	-
125	1.8- 1.9	34.75-34.76	1,603	559,571	-	-	1	96	3	-	-	-
126	1.8- 1.9	34.89-34.90	1,564	561,135	-	-	-	-	-	98	2	-
127	2.4- 2.6	34.91-34.92	3,061	564,196	-	-	-	-	-	8	92	-
128	1.4- 1.5	34.72-34.73	1,515	565,711	-	16	21	54	-	-	3	6
129	0.0- 0.1	34.70-34.71	1,507	567,218	-	-	93	6	-	-	1	-
130	2.2- 2.4	34.60-34.61	2,998	570,216	24	69	4	1	1	-	-	1
131	-0.2--0.1	34.66-34.67	1,497	571,713	-	-	-	2	-	-	19	79
132	1.8- 1.9	34.72-34.73	1,489	573,202	-	23	18	50	9	-	-	-
133	2.6- 2.8	34.93-34.94	2,946	576,148	-	-	-	-	-	32	68	-
134	2.6- 2.8	34.94-34.95	2,939	579,087	-	-	-	-	-	82	18	-
135	1.7- 1.8	34.62-34.63	1,468	580,555	98	-	-	-	2	-	-	-
136	1.9- 2.0	34.66-34.67	1,459	582,014	9	83	3	-	2	-	1	2
137	1.9- 2.0	34.74-34.75	1,452	583,466	-	3	3	84	10	-	-	-
138	1.7- 1.8	34.64-34.65	1,448	584,914	90	8	1	-	1	-	-	-
139	1.5- 1.6	34.75-34.76	1,448	586,362	-	-	4	64	27	-	5	-

Rank	T°	S, ‰	Volume	Total Volume	N. Pac.	S. Pac.	So. O. Pac.	Ind.	So. O. Ind.	N. Atl.	S. Atl.	So. O. Atl.
140	2.0- 2.2	34.72-34.73	2,872	589,234	-	11	3	81	5	-	-	-
141	1.1- 1.2	34.74-34.75	1,404	590,638	-	8	16	45	20	-	11	-
142	2.0- 2.2	34.65-34.66	2,807	593,445	13	74	8	1	3	-	-	1
143	1.7- 1.8	34.63-34.64	1,393	594,838	98	-	-	-	1	-	-	1
144	2.2- 2.4	34.59-34.60	2,778	597,616	35	58	4	1	1	-	-	1
145	1.3- 1.4	34.71-34.72	1,385	599,001	-	89	6	4	-	-	-	1
146	0.6- 0.7	34.72-34.73	1,353	600,354	-	1	37	36	2	-	24	-
147	1.6- 1.7	34.61-34.62	1,347	601,701	100	-	-	-	-	-	-	-
148	0.2- 0.3	34.71-34.72	1,306	603,007	-	-	54	8	-	-	38	-
149	2.2- 2.4	34.63-34.64	2,591	605,598	19	73	3	4	1	-	-	-
150	1.8- 1.9	34.87-34.88	1,288	606,886	-	-	-	-	-	53	47	-
151	-0.8--0.7	34.65-34.66	1,284	608,170	-	-	-	-	-	-	-	100
152	2.4- 2.6	34.94-34.95	2,526	610,696	-	-	-	-	-	99	1	-
153	-0.2--0.1	34.68-34.69	1,259	611,955	-	-	2	4	84	-	8	2
154	-0.4--0.3	34.66-34.67	1,251	613,206	-	-	-	3	-	-	2	95
155	2.0- 2.2	34.61-34.62	2,493	615,699	45	47	4	1	3	-	-	-
156	1.9- 2.0	34.87-34.88	1,240	616,939	-	-	-	-	-	1	99	-
157	1.2- 1.3	34.70-34.71	1,236	618,175	-	90	2	-	5	-	-	3
158	2.6- 2.8	34.95-34.96	2,463	620,638	-	-	-	-	-	98	2	-
159	0.4- 0.5	34.69-34.70	1,226	621,864	-	-	17	13	31	-	10	29
160	1.7- 1.8	34.60-34.61	1,216	623,080	98	-	-	-	2	-	-	-
161	-0.4--0.3	34.67-34.68	1,205	624,285	-	-	-	6	85	-	-	9
162	-0.4--0.3	34.65-34.66	1,194	625,479	-	-	-	-	-	-	-	100
163	1.9- 2.0	34.75-34.76	1,177	626,656	-	-	-	100	-	-	-	-
164	2.6- 2.8	34.92-34.93	2,343	628,999	-	-	-	-	-	10	90	-
165	2.8- 3.0	34.94-34.95	2,339	631,338	-	-	-	-	-	56	44	-
166	1.7- 1.8	34.87-34.88	1,149	632,487	-	-	-	-	-	73	27	-
167	0.3- 0.4	34.71-34.72	1,134	633,621	-	2	57	9	-	-	32	-
168	0.2- 0.3	34.68-34.69	1,128	634,749	-	-	7	2	29	-	14	48
169	1.7- 1.8	34.68-34.69	1,120	635,869	-	94	2	-	3	-	-	1
170	1.6- 1.7	34.69-34.70	1,114	636,983	-	94	4	-	1	-	-	1
171	0.0- 0.1	34.69-34.70	1,109	638,092	-	-	35	16	32	-	17	-
172	1.7- 1.8	34.72-34.73	1,105	639,197	-	26	23	39	10	-	-	2
173	2.4- 2.6	34.60-34.61	2,202	641,399	33	55	-	10	-	-	2	-
174	2.4- 2.6	34.57-34.58	2,200	643,599	29	62	-	6	-	-	3	-
175	2.8- 3.0	34.95-34.96	2,194	645,793	-	-	-	-	-	87	13	-
176	1.5- 1.6	34.72-34.73	1,096	646,889	-	26	23	35	5	-	3	8
177	2.8- 3.0	34.93-34.94	2,190	649,079	-	-	-	-	-	11	89	-
178	1.6- 1.7	34.72-34.73	1,037	650,116	-	23	21	38	11	-	1	6
179	2.0- 2.2	34.71-34.72	2,062	652,178	-	19	7	66	8	-	-	-
180	1.5- 1.6	34.70-34.71	1,026	653,204	-	94	4	-	1	-	-	1
181	1.8- 1.9	34.67-34.68	1,019	654,223	-	93	4	-	2	-	1	-
182	1.4- 1.5	34.75-34.76	1,019	655,242	-	-	1	66	24	-	9	-
183	1.7- 1.8	34.61-34.62	1,018	656,260	97	-	-	-	2	-	-	1
184	0.0- 0.1	34.67-34.68	1,003	657,263	-	-	1	2	13	-	14	70
185	2.4- 2.6	34.61-34.62	1,996	659,259	35	48	-	14	-	-	3	-
186	1.8- 1.9	34.62-34.63	980	660,239	96	2	1	-	1	-	-	-
187	1.8- 1.9	34.63-34.64	975	661,214	88	9	2	-	1	-	-	-
188	2.2- 2.4	34.93-34.94	1,922	663,136	-	-	-	-	-	100	-	-
189	2.4- 2.6	34.58-34.59	1,892	665,028	37	51	-	8	-	-	4	-
190	1.8- 1.9	34.61-34.62	931	665,959	98	-	1	-	1	-	-	-
191	-0.1- 0.0	34.70-34.71	930	666,889	-	-	97	3	-	-	-	-
192	1.5- 1.6	34.62-34.63	925	667,814	99	-	1	-	-	-	-	-
193	-0.5--0.4	34.66-34.67	908	668,722	-	-	-	3	2	-	-	95
194	1.4- 1.5	34.71-34.72	889	669,611	-	84	9	4	-	-	-	3
195	1.9- 2.0	34.62-34.63	887	670,498	81	13	3	-	1	-	1	1
196	1.7- 1.8	34.59-34.60	877	671,375	97	-	1	-	2	-	-	-
197	2.2- 2.4	34.58-34.59	1,742	673,117	33	56	7	2	1	-	-	1
198	1.8- 1.9	34.90-34.91	869	673,986	-	-	-	-	-	100	-	-
199	1.8- 1.9	34.58-34.59	864	674,850	97	-	1	-	1	-	-	1
200	-0.3--0.2	34.68-34.69	857	675,707	-	-	1	-	99	-	-	-
201	0.7- 0.8	34.70-34.71	855	676,562	-	22	36	14	10	-	7	11
202	2.4- 2.6	34.59-34.60	1,710	678,272	27	59	-	11	-	-	3	-
203	2.8- 3.0	34.96-34.97	1,706	679,978	-	-	-	-	-	98	2	-
204	2.4- 2.6	34.56-34.57	1,679	681,657	17	72	-	7	-	-	4	-
205	1.9- 2.0	34.71-34.72	828	682,485	-	39	29	16	16	-	-	-
206	3.0- 3.2	34.94-34.96	3,289	685,774	-	-	-	-	-	60	40	-
207	1.8- 1.9	34.76-34.77	820	686,594	-	-	-	100	-	-	-	-
208	2.6- 2.8	34.59-34.60	1,638	688,232	35	50	-	9	-	-	6	-
209	0.1- 0.2	34.71-34.72	817	689,049	-	-	95	3	-	-	2	-
210	2.0- 2.2	34.60-34.61	1,611	690,660	70	18	5	2	4	-	-	1

Rank	T°	S, ‰	Volume	Total Volume	N. Pac.	S. Pac.	So. O. Pac.	Ind.	So. O. Ind.	N. Atl.	S. Atl.	So. O. Atl.
211	1.9- 2.0	34.76-34.77	801	691,461	-	-	-	100	-	-	-	-
212	1.8- 1.9	34.60-34.61	800	692,261	96	-	2	-	2	-	-	-
213	1.5- 1.6	34.85-34.86	798	693,059	-	-	-	-	-	87	13	-
214	2.2- 2.4	34.64-34.65	1,595	694,654	21	61	4	12	2	-	-	-
215	2.4- 2.6	34.62-34.63	1,582	696,236	21	54	-	21	-	-	4	-
216	1.8- 1.9	34.59-34.60	790	697,026	97	-	2	-	1	-	-	-
217	2.4- 2.6	34.90-34.91	1,578	698,604	-	-	-	-	-	-	100	-
218	1.9- 2.0	34.91-34.92	788	699,392	-	-	-	-	-	100	-	-
219	2.2- 2.4	34.89-34.90	1,563	700,955	-	-	-	-	-	-	100	-
220	2.0- 2.2	34.73-34.74	1,545	702,500	-	5	1	91	3	-	-	-
221	3.2- 3.4	34.96-34.98	3,062	705,562	-	-	-	-	-	71	29	-
222	2.2- 2.4	34.88-34.89	1,530	707,092	-	-	-	-	-	-	100	-
223	2.0- 2.2	34.74-34.75	1,477	708,569	-	-	-	97	-	-	3	-
224	2.4- 2.6	34.63-34.64	1,475	710,044	27	44	-	25	-	-	4	-
225	1.7- 1.8	34.88-34.89	732	710,776	-	-	-	-	-	98	2	-
226	1.9- 2.0	34.56-34.57	729	711,505	96	-	2	-	1	-	1	-
227	-0.1- 0.0	34.66-34.67	720	712,225	-	-	-	-	-	-	-	100
228	2.0- 2.2	34.70-34.71	1,433	713,658	-	37	16	36	11	-	-	-
229	0.3- 0.4	34.68-34.69	714	714,372	-	-	5	-	17	-	10	68
230	3.0- 3.2	34.96-34.98	2,745	717,117	-	-	-	-	-	89	11	-
231	2.4- 2.6	34.55-34.56	1,372	718,489	22	67	1	6	-	-	4	-
232	2.6- 2.8	34.60-34.61	1,367	719,856	45	37	-	10	-	-	8	-
233	1.9- 2.0	34.61-34.62	679	720,535	93	-	3	-	1	-	2	1
234	2.0- 2.2	34.92-34.93	1,332	721,867	-	-	-	-	-	98	2	-
235	1.6- 1.7	34.86-34.87	664	722,531	-	-	-	-	-	76	24	-
236	1.8- 1.9	34.57-34.58	663	723,194	98	-	1	-	1	-	-	-
237	2.6- 2.8	34.91-34.92	1,313	724,507	-	-	-	-	-	-	100	-
238	0.1- 0.2	34.67-34.68	656	725,163	-	-	-	1	8	-	15	76
239	1.4- 1.5	34.63-34.64	652	725,815	100	-	-	-	-	-	-	-
240	1.9- 2.0	34.60-34.61	649	726,464	95	-	2	-	1	-	1	1
241	1.9- 2.0	34.57-34.58	645	727,109	96	-	2	-	1	-	1	-
242	1.7- 1.8	34.71-34.72	642	727,751	-	33	34	-	16	-	4	13
243	3.4- 3.6	34.96-34.98	2,566	730,317	-	-	-	-	-	64	36	-
244	1.3- 1.4	34.75-34.76	639	730,956	-	-	2	64	11	-	23	-
245	-0.5--0.4	34.67-34.68	638	731,594	-	-	-	-	96	-	-	4
246	2.0- 2.2	34.75-34.76	1,275	732,869	-	-	-	99	-	-	1	-
247	-0.9--0.8	34.65-34.66	635	733,504	-	-	-	-	-	-	-	100
248	2.6- 2:8	34.56-34.57	1,247	734,751	53	30	-	11	-	-	6	-
249	1.9- 2.0	34.70-34.71	620	735,371	-	47	37	2	12	-	-	2
250	1.7- 1.8	34.69-34.70	620	735,991	-	82	6	-	9	-	2	1
251	-0.4--0.3	34.68-34.69	613	736,604	-	-	-	-	100	-	-	-
252	1.8- 1.9	34.71-34.72	613	737,217	-	40	48	-	9	-	-	3
253	2.6- 2.8	34.58-34.59	1,221	738,438	25	54	-	13	-	-	8	-
254	2.8- 3.0	34.92-34.93	1,208	739,646	-	-	-	-	-	1	99	-
255	0.3- 0.4	34.72-34.73	592	740,238	-	-	12	9	-	-	79	-
256	0.0- 0.1	34.71-34.72	576	740,814	-	-	100	-	-	-	-	-
257	2.6- 2.8	34.53-34.54	1,146	741,960	23	58	-	11	-	-	8	-
258	2.0- 2.2	34.68-34.69	1,144	743,104	-	56	24	6	13	-	-	1
259	2.0- 2.2	34.69-34.70	1,139	744,243	-	47	22	16	14	-	-	1
260	1.6- 1.7	34.71-34.72	567	744,810	-	40	35	-	6	-	7	12
261	2.6- 2.8	34.57-34.58	1,124	745,934	36	42	-	14	-	-	8	-
262	2.0- 2.2	34.54-34.55	1,112	747,046	92	-	2	2	4	-	-	-
263	2.6- 2.8	34.61-34.62	1,102	748,148	29	50	-	11	-	-	10	-
264	0.8- 0.9	34.73-34.74	550	748,698	-	10	14	53	8	-	15	-
265	2.8- 3.0	34.58-34.59	1,098	749,796	42	51	-	5	-	-	2	-
266	1.9- 2.0	34.69-34.70	548	750,344	-	42	41	-	10	-	1	6
267	2.0- 2.2	34.76-34.77	1,084	751,428	-	-	-	93	-	-	7	-
268	3.2- 3.4	34.94-34.96	2,148	753,576	-	-	-	-	-	60	40	-
269	1.9- 2.0	34.58-34.59	535	754,111	96	-	2	-	-	-	1	1
270	2.6- 2.8	34.54-34.55	1,059	755,170	18	61	-	12	-	-	9	-
271	2.6- 2.8	34.55-34.56	1,055	756,225	34	46	-	12	-	-	8	-
272	-0.9--0.8	34.64-34.65	527	756,752	-	-	-	-	-	-	-	100
273	3.0- 3.2	34.92-34.94	2,091	758,843	-	-	-	-	-	13	87	-
274	0.7- 0.8	34.76-34.77	522	759,365	-	-	-	-	-	1	99	-
275	1.6- 1.7	34.60-34.61	517	759,882	99	-	-	-	-	-	-	1
276	2.2- 2.4	34.70-34.71	1,032	760,914	-	2	-	98	-	-	-	-
277	1.2- 1.3	34.65-34.66	514	761,428	100	-	-	-	-	-	-	-
278	2.6- 2.8	34.52-34.53	1,026	762,454	17	62	-	12	-	-	9	-
279	2.0- 2.2	34.53-34.54	1,026	763,480	92	-	2	2	4	-	-	-
280	1.7- 1.8	34.86-34.87	503	763,983	-	-	-	-	-	25	75	-
281	1.1- 1.2	34.66-34.67	503	764,486	97	-	2	-	1	-	-	-

Rank	T°	S, ‰	Volume	Total Volume	N. Pac.	S. Pac.	So. O. Pac.	Ind.	So. O. Ind.	N. Atl.	S. Atl.	So. O. Atl.
282	1.9- 2.0	34.55-34.56	503	764,989	93	-	3	1	1	-	1	1
283	1.8- 1.9	34.68-34.69	501	765,490	-	85	8	-	5	-	2	-
284	1.9- 2.0	34.59-34.60	499	765,989	94	-	2	-	1	-	2	1
285	0.4- 0.5	34.72-34.73	496	766,485	-	-	21	25	-	-	54	-
286	0.6- 0.7	34.75-34.76	495	766,980	-	-	-	-	-	3	97	-
287	2.0- 2.2	34.67-34.68	989	767,969	-	53	29	4	13	-	-	1
288	2.6- 2.8	34.96-34.97	989	768,958	-	-	-	-	-	100	-	-
289	2.8- 3.0	34.97-34.98	986	769,944	-	-	-	-	-	100	-	-
290	2.2- 2.4	34.71-34.72	986	770,930	-	-	-	100	-	-	-	-
291	1.9- 2.0	34.67-34.68	491	771,421	-	66	15	-	8	-	2	9
292	0.5- 0.6	34.69-34.70	489	771,910	-	-	27	-	26	-	18	29
293	2.4- 2.6	34.54-34.55	967	772,877	26	63	1	6	-	-	4	-
294	3.2- 3.4	34.92-34.94	1,933	774,810	-	-	-	-	-	62	38	-
295	1.3- 1.4	34.64-34.65	482	775,292	100	-	-	-	-	-	-	-
296	2.0- 2.2	34.55-34.56	963	776,255	90	-	3	2	4	-	-	1
297	1.8- 1.9	34.70-34.71	478	776,733	-	35	36	-	8	-	3	18
298	1.5- 1.6	34.71-34.72	475	777,208	-	56	24	4	6	-	3	7
299	2.0- 2.2	34.77-34.78	938	778,146	-	-	-	91	-	-	9	-
300	2.8- 3.0	34.59-34.60	937	779,083	52	37	-	8	-	-	3	-
301	1.6- 1.7	34.70-34.71	468	779,551	-	78	13	-	7	-	-	2
302	2.2- 2.4	34.50-34.51	933	780,484	90	-	6	2	1	-	1	-
303	1.7- 1.8	34.76-34.77	465	780,949	-	-	-	93	-	-	7	-
304	1.6- 1.7	34.87-34.88	463	781,412	-	-	-	-	-	97	3	-
305	3.6- 3.8	34.96-34.98	1,845	783,257	-	-	-	-	-	62	38	-
306	2.2- 2.4	34.69-34.70	919	784,176	-	7	-	92	1	-	-	-
307	2.0- 2.2	34.66-34.67	918	785,094	1	54	26	4	12	-	-	3
308	-0.1- 0.0	34.69-34.70	454	785,548	-	-	40	26	34	-	-	-
309	2.6- 2.8	34.62-34.63	908	786,456	38	40	-	9	-	-	13	-
310	0.4- 0.5	34.68-34.69	453	786,909	-	-	3	-	17	-	11	69
311	2.0- 2.2	34.59-34.60	852	787,761	80	-	8	3	7	-	-	2
312	2.2- 2.4	34.72-34.73	849	788,610	-	-	-	89	-	-	11	-
313	2.8- 3.0	34.56-34.57	847	789,457	28	57	-	11	-	-	4	-
314	2.8- 3.0	34.55-34.56	828	790,285	44	37	-	15	-	-	4	-
315	0.4- 0.5	34.73-34.74	413	790,698	-	-	-	1	-	-	99	-
316	-0.3--0.2	34.65-34.66	410	791,108	-	-	-	-	-	-	-	100
317	2.6- 2.8	34.51-34.52	818	791,926	17	62	-	11	-	-	10	-
318	2.8- 3.0	34.60-34.61	818	792,744	37	51	-	9	-	-	3	-
319	2.2- 2.4	34.49-34.50	816	793,560	89	-	6	3	1	-	1	-
320	0.5- 0.6	34.74-34.75	405	793,965	-	-	-	-	-	-	100	-
321	2.8- 3.0	34.54-34.55	808	794,773	62	21	-	14	-	-	3	-
322	2.2- 2.4	34.57-34.58	802	795,575	45	32	14	4	3	-	1	1
323	2.2- 2.4	34.66-34.67	801	796,376	-	45	5	48	2	-	-	-
324	2.2- 2.4	34.65-34.66	799	797,175	1	52	8	36	3	-	-	-
325	-0.6--0.5	34.66-34.67	398	797,573	-	-	-	4	-	-	-	96
326	2.2- 2.4	34.51-34.52	796	798,369	88	-	7	3	1	-	1	-
327	2.8- 3.0	34.57-34.58	792	799,161	32	59	-	6	-	-	3	-
328	2.0- 2.2	34.56-34.57	790	799,951	86	-	5	3	5	-	-	1
329	2.4- 2.6	34.46-34.47	786	800,737	81	7	5	1	-	-	5	1
330	1.0- 1.1	34.74-34.75	393	801,130	-	-	13	50	13	-	24	-
331	2.6- 2.8	34.50-34.51	782	801,912	24	56	-	10	-	-	10	-
332	0.9- 1.0	34.68-34.69	390	802,302	88	-	1	-	8	-	-	3
333	3.0- 3.2	34.56-34.58	1,514	803,816	37	51	-	8	-	-	4	-
334	2.2- 2.4	34.76-34.77	756	804,572	-	-	-	97	-	-	3	-
335	0.5- 0.6	34.72-34.73	377	804,949	-	-	51	28	-	-	21	-
336	2.2- 2.4	34.67-34.68	754	805,703	-	29	1	69	1	-	-	-
337	1.7- 1.8	34.58-34.59	374	806,077	94	-	2	-	3	-	-	1
338	2.0- 2.2	34.52-34.53	747	806,824	89	-	3	3	4	-	-	1
339	1.9- 2.0	34.68-34.69	373	807,197	-	31	38	-	12	-	3	16
340	2.2- 2.4	34.68-34.69	739	807,936	-	10	-	89	1	-	-	-
341	3.0- 3.2	34.58-34.60	1,475	809,411	48	43	-	5	-	-	4	-
342	2.0- 2.2	34.58-34.59	734	810,145	80	-	7	4	7	-	-	2
343	1.4- 1.5	34.84-34.85	365	810,510	-	-	-	-	-	76	24	-
344	2.8- 3.0	34.51-34.52	715	811,225	28	56	-	13	-	-	3	-
345	-0.5--0.4	34.68-34.69	357	811,582	-	-	-	-	100	-	-	-
346	2.8- 3.0	34.61-34.62	706	812,288	43	45	-	9	-	-	3	-
347	0.5- 0.6	34.73-34.74	353	812,641	-	-	3	22	-	-	75	-
348	2.0- 2.2	34.57-34.58	705	813,346	82	-	6	4	6	-	-	2
349	1.8- 1.9	34.69-34.70	352	813,698	-	44	23	-	15	-	3	15
350	2.6- 2.8	34.42-34.43	701	814,399	76	11	3	2	-	-	7	1
351	2.4- 2.6	34.45-34.46	699	815,098	84	3	5	1	-	-	6	1
352	2.4- 2.6	34.53-34.54	697	815,795	28	57	2	6	-	-	6	1

Rank	T°	S, ‰	Volume	Total Volume	N. Pac.	S. Pac.	So. O. Pac.	Ind.	So. O. Ind.	N. Atl.	S. Atl.	So. O. Atl.
353	2.4- 2.6	34.88-34.89	697	816,492	-	-	-	-	-	-	100	-
354	-0.2--0.1	34.71-34.72	343	816,835	-	-	100	-	-	-	-	-
355	2.6- 2.8	34.43-34.44	686	817,521	70	16	3	2	-	-	8	1
356	2.6- 2.8	34.49-34.50	680	818,201	18	61	-	12	-	-	9	-
357	2.4- 2.6	34.47-34.48	678	818,879	77	10	5	1	-	-	6	1
358	3.2- 3.4	34.56-34.58	1,355	820,234	50	38	-	5	-	-	7	-
359	2.8- 3.0	34.50-34.51	677	820,911	16	67	-	13	-	-	4	-
360	2.4- 2.6	34.95-34.96	671	821,582	-	-	-	-	-	100	-	-
361	0.8- 0.9	34.77-34.78	333	821,915	-	-	-	-	-	2	98	-
362	2.2- 2.4	34.74-34.75	658	822,573	-	-	-	87	-	-	13	-
363	2.8- 3.0	34.53-34.54	653	823,226	46	33	-	17	-	-	4	-
364	-0.2--0.1	34.70-34.71	326	823,552	-	-	100	-	-	-	-	-
365	0.2- 0.3	34.67-34.68	326	823,878	-	-	-	-	2	-	15	83
366	2.8- 3.0	34.49-34.50	645	824,523	17	64	-	14	-	-	5	-
367	3.4- 3.6	34.92-34.94	1,286	825,809	-	-	-	-	-	55	45	-
368	0.6- 0.7	34.73-34.74	320	826,129	-	-	3	26	-	-	71	-
369	3.2- 3.4	34.58-34.60	1,280	827,409	42	42	-	9	-	-	7	-
370	-0.8--0.7	34.64-34.65	320	827,729	-	-	-	-	-	-	-	100
371	1.7- 1.8	34.70-34.71	319	828,048	-	40	19	-	24	-	6	11
372	2.2- 2.4	34.48-34.49	634	828,682	87	-	7	3	1	-	1	1
373	2.4- 2.6	34.76-34.77	633	829,315	-	-	-	89	-	-	11	-
374	2.6- 2.8	34.41-34.42	629	829,944	78	9	3	1	-	-	8	1
375	2.2- 2.4	34.52-34.53	615	830,559	81	-	11	4	2	-	1	1
376	2.2- 2.4	34.56-34.57	614	831,173	57	14	18	5	3	-	1	2
377	2.2- 2.4	34.78-34.79	612	831,785	-	-	-	95	-	-	5	-
378	1.4- 1.5	34.83-34.84	305	832,090	-	-	-	-	-	33	67	-
379	0.7- 0.8	34.73-34.74	302	832,392	-	-	5	14	-	-	81	-
380	3.8- 4.0	34.96-34.98	1,204	833,596	-	-	-	-	-	58	42	-
381	3.0- 3.2	34.98-35.00	1,192	834,788	-	-	-	-	-	99	1	-
382	2.8- 3.0	34.52-34.53	595	835,383	33	45	-	18	-	-	4	-
383	0.9- 1.0	34.78-34.79	297	835,680	-	-	-	-	-	2	98	-
384	-0.2--0.1	34.69-34.70	297	835,977	-	-	40	57	3	-	-	-
385	2.4- 2.6	34.52-34.53	591	836,568	30	51	5	4	-	-	8	2
386	2.8- 3.0	34.38-34.39	590	837,158	73	13	3	2	-	-	9	-
387	1.2- 1.3	34.75-34.76	295	837,453	-	-	-	67	4	-	29	-
388	1.6- 1.7	34.76-34.77	293	837,746	-	-	-	70	-	-	30	-
389	1.9- 2.0	34.77-34.78	289	838,035	-	-	-	90	-	-	10	-
390	2.6- 2.8	34.48-34.49	576	838,611	16	61	-	11	-	-	11	1
391	3.0- 3.2	34.54-34.56	1,147	839,758	33	56	-	7	-	-	4	-
392	2.8- 3.0	34.48-34.49	572	840,330	26	56	-	13	-	-	5	-
393	0.6- 0.7	34.74-34.75	284	840,614	-	-	-	2	-	-	98	-
394	2.2- 2.4	34.77-34.78	568	841,182	-	-	-	95	-	-	5	-
395	3.0- 3.2	34.46-34.48	1,135	842,317	17	63	-	14	-	-	6	-
396	0.7- 0.8	34.74-34.75	283	842,600	-	-	-	27	-	-	73	-
397	2.0- 2.2	34.78-34.79	560	843,160	-	-	-	75	-	-	25	-
398	2.4- 2.6	34.44-34.45	558	843,718	83	3	4	1	-	-	8	1
399	2.8- 3.0	34.91-34.92	556	844,274	-	-	-	-	-	-	100	-
400	1.5- 1.6	34.84-34.85	277	844,551	-	-	-	-	-	26	74	-
401	3.4- 3.6	34.94-34.96	1,108	845,659	-	-	-	-	-	53	47	-
402	1.3- 1.4	34.83-34.84	276	845,935	-	-	-	-	-	73	27	-
403	2.2- 2.4	34.75-34.76	552	846,487	-	-	-	93	-	-	7	-
404	2.8- 3.0	34.39-34.40	549	847,036	70	17	1	4	-	-	8	-
405	1.6- 1.7	34.85-34.86	271	847,307	-	-	-	-	-	20	80	-
406	2.4- 2.6	34.77-34.78	540	847,847	-	-	-	88	-	-	12	-
407	0.3- 0.4	34.67-34.68	269	848,116	-	-	-	-	3	-	-	97
408	2.4- 2.6	34.48-34.49	537	848,653	69	13	7	1	1	-	8	1
409	3.6- 3.8	34.98-35.00	1,068	849,721	-	-	-	-	-	96	4	-
410	2.2- 2.4	34.73-34.74	533	850,254	-	-	-	89	-	-	11	-
411	3.6- 3.8	34.56-34.58	1,054	851,308	37	44	-	11	-	-	8	-
412	3.2- 3.4	34.54-34.56	1,048	852,356	25	57	-	8	-	-	10	-
413	1.0- 1.1	34.79-34.80	261	852,617	-	-	-	-	-	1	99	-
414	2.2- 2.4	34.55-34.56	520	853,137	54	15	19	6	3	-	1	2
415	2.4- 2.6	34.89-34.90	517	853,654	-	-	-	-	-	-	100	-
416	3.2- 3.4	34.90-34.92	1,032	854,686	-	-	-	1	-	35	64	-
417	3.0- 3.2	34.52-34.54	1,031	855,717	58	30	-	8	-	-	4	-
418	3.4- 3.6	34.56-34.58	1,030	856,747	53	36	-	8	-	-	3	-
419	2.8- 3.0	34.45-34.46	514	857,261	16	66	-	14	-	-	4	-
420	2.8- 3.0	34.37-34.38	508	857,769	73	10	3	2	-	-	11	1
421	3.4- 3.6	34.54-34.56	1,015	858,784	36	54	-	6	-	-	4	-
422	2.6- 2.8	34.47-34.48	507	859,291	24	51	1	12	-	-	11	1
423	2.6- 2.8	34.76-34.77	505	859,796	-	-	-	69	-	-	31	-

Rank	T°	S, ‰	Volume	Total Volume	N. Pac.	S. Pac.	So. O. Pac.	Ind.	So. O. Ind.	N. Atl.	S. Atl.	So. O. Atl.
424	3.2- 3.4	34.44-34.46	1,010	860,806	19	57	-	16	-	-	8	-
425	1.3- 1.4	34.82-34.83	252	861,058	-	-	-	-	-	14	86	-
426	-0.1- 0.0	34.71-34.72	251	861,309	-	-	100	-	-	-	-	-
427	1.8- 1.9	34.56-34.57	248	861,557	95	-	2	-	3	-	-	-
428	3.4- 3.6	34.98-35.00	988	862,545	-	-	-	-	-	98	2	-
429	3.8- 4.0	34.56-34.58	986	863,531	39	42	-	6	-	-	13	-
430	1.5- 1.6	34.61-34.62	245	863,776	98	-	1	-	1	-	-	-
431	2.4- 2.6	34.87-34.88	490	864,266	-	-	-	-	-	-	100	-
432	2.8- 3.0	34.44-34.45	489	864,755	22	62	-	12	-	-	4	-
433	2.6- 2.8	34.40-34.41	485	865,240	77	6	4	1	-	-	11	1
434	3.0- 3.2	34.50-34.52	969	866,209	52	28	-	16	-	-	4	-
435	2.8- 3.0	34.46-34.47	482	866,691	18	63	-	15	-	-	4	-
436	2.2- 2.4	34.79-34.80	480	867,171	-	-	-	93	-	-	7	-
437	2.4- 2.6	34.79-34.80	479	867,650	-	-	-	74	-	-	26	-
438	2.8- 3.0	34.47-34.48	475	868,125	28	55	-	13	-	-	4	-
439	1.2- 1.3	34.81-34.82	237	868,362	-	-	-	-	-	6	94	-
440	1.8- 1.9	34.91-34.92	236	868,598	-	-	-	-	-	100	-	-
441	1.1- 1.2	34.80-34.81	235	868,833	-	-	-	-	-	1	99	-
442	2.2- 2.4	34.54-34.55	466	869,299	55	11	19	7	3	-	3	2
443	3.8- 4.0	34.94-34.96	928	870,227	-	-	-	2	-	50	48	-
444	1.7- 1.8	34.89-34.90	232	870,459	-	-	-	-	-	100	-	-
445	2.8- 3.0	34.43-34.44	463	870,922	19	65	-	12	-	-	4	-
446	0.7- 0.8	34.75-34.76	231	871,153	-	-	-	-	-	-	100	-
447	0.8- 0.9	34.76-34.77	230	871,383	-	-	-	-	-	1	99	
448	3.4- 3.6	34.42-34.44	919	872,302	18	51	-	20	-	-	11	-
449	3.2- 3.4	34.52-34.54	911	873,213	32	48	-	7	-	-	13	-
450	3.2- 3.4	34.98-35.00	907	874,120	-	-	-	-	-	100	-	-
451	1.5- 1.6	34.76-34.77	223	874,343	-	-	-	48	-	-	52	-
452	2.2- 2.4	34.53-34.54	444	874,787	62	3	19	6	3	-	6	1
453	2.8- 3.0	34.36-34.37	441	875,228	74	5	4	2	-	-	14	1
454	2.4- 2.6	34.78-34.79	439	875,667	-	-	-	82	-	-	18	-
455	0.5- 0.6	34.68-34.69	219	875,886	-	-	2	-	2	-	-	96
456	2.4- 2.6	34.51-34.52	436	876,322	31	43	9	4	1	-	10	2
457	0.6- 0.7	34.69-34.70	218	876,540	-	-	32	-	3	-	11	54
458	3.4- 3.6	34.58-34.60	868	877,408	37	40	-	19	-	-	4	-
459	1.6- 1.7	34.77-34.78	217	877,625	-	-	-	47	-	-	53	-
460	1.9- 2.0	34.85-34.86	215	877,840	-	-	-	-	-	-	100	-
461	2.6- 2.8	34.85-34.86	430	878,270	-	-	-	1	-	-	99	-
462	2.6- 2.8	34.44-34.45	430	878,700	57	22	4	4	-	-	12	1
463	3.0- 3.2	34.34-34.36	856	879,556	72	15	1	5	-	-	7	-
464	2.4- 2.6	34.80-34.81	427	879,983	-	-	-	62	-	-	38	-
465	2.6- 2.8	34.80-34.81	426	880,409	-	-	-	61	-	-	39	-
466	3.0- 3.2	34.48-34.50	851	881,260	30	45	-	19	-	-	6	-
467	2.0- 2.2	34.51-34.52	425	881,685	82	-	5	5	7	-	-	1
468	3.2- 3.4	34.48-34.50	843	882,528	49	28	-	9	-	-	14	-
469	3.0- 3.2	34.60-34.62	835	883,363	38	38	-	18	-	-	6	-
470	2.4- 2.6	34.74-34.75	416	883,779	-	-	-	81	-	-	19	-
471	2.4- 2.6	34.49-34.50	415	884,194	56	20	10	2	1	-	10	1
472	3.2- 3.4	34.88-34.90	829	885,023	-	-	-	9	-	51	40	-
473	3.2- 3.4	34.38-34.40	829	885,852	15	75	-	8	-	-	2	-
474	1.0- 1.1	34.67-34.68	206	886,058	87	-	4	-	1	-	-	8
475	3.0- 3.2	34.40-34.42	820	886,878	17	72	-	10	-	-	1	-
476	0.9- 1.0	34.77-34.78	205	887,083	-	-	-	-	-	-	100	-
477	2.4- 2.6	34.64-34.65	410	887,493	3	12	-	70	-	-	15	-
478	2.6- 2.8	34.77-34.78	408	887,901	-	-	-	63	-	-	37	-
479	2.4- 2.6	34.68-34.69	407	888,308	-	-	-	83	-	-	17	-
480	2.0- 2.2	34.87-34.88	406	888,714	-	-	-	-	-	-	100	-
481	2.4- 2.6	34.72-34.73	403	889,117	-	-	-	65	-	-	35	-
482	2.0- 2.2	34.85-34.86	403	889,520	-	-	-	-	-	-	100	-
483	2.4- 2.6	34.75-34.76	403	889,923	-	-	-	80	-	-	20	-
484	2.8- 3.0	34.40-34.41	403	890,326	57	23	1	9	-	-	9	1
485	2.4- 2.6	34.71-34.72	401	890,727	-	-	-	79	-	-	21	-
486	2.4- 2.6	34.69-34.70	400	891,127	-	-	-	80	-	-	20	-
487	3.2- 3.4	34.50-34.52	797	891,924	47	28	-	9	-	-	16	-
488	2.6- 2.8	34.81-34.82	396	892,320	-	-	-	56	-	-	44	-
489	3.6- 3.8	34.40-34.42	792	893,112	8	55	-	21	-	-	16	-
490	1.9- 2.0	34.54-34.55	197	893,309	85	-	6	1	3	-	3	2
491	1.5- 1.6	34.86-34.87	197	893,506	-	-	-	-	-	97	3	-
492	3.8- 4.0	34.98-35.00	785	894,291	-	-	-	-	-	99	1	-
493	2.6- 2.8	34.75-34.76	392	894,683	-	-	-	60	-	-	40	-
494	3.6- 3.8	34.52-34.54	782	895,465	22	65	-	6	-	-	7	-

Rank	T°	S, ‰	Volume	Total Volume	N. Pac.	S. Pac.	So. O. Pac.	Ind.	So. O. Ind.	N. Atl.	S. Atl.	So. O. Atl.
495	-0.6--0.5	34.68-34.69	195	895,660	-	-	-	-	100	-	-	-
496	3.0- 3.2	34.42-34.44	779	896,439	29	58	-	12	-	-	1	-
497	2.6- 2.8	34.79-34.80	388	896,827	-	-	-	61	-	-	39	-
498	2.8- 3.0	34.98-34.99	388	897,215	-	-	-	-	-	100	-	-
499	0.8- 0.9	34.74-34.75	194	897,409	-	-	-	38	-	-	62	-
500	2.6- 2.8	34.78-34.79	387	897,796	-	-	-	64	-	-	36	-
501	2.6- 2.8	34.46-34.47	385	898,181	34	40	1	10	-	-	14	1
502	2.6- 2.8	34.71-34.72	384	898,565	-	-	-	57	-	-	43	-
503	3.0- 3.2	34.44-34.46	767	899,332	29	48	-	17	-	-	6	-
504	2.8- 3.0	34.42-34.43	382	899,714	39	41	-	13	-	-	7	-
505	2.4- 2.6	34.86-34.87	381	900,095	-	-	-	-	-	-	100	-
506	2.6- 2.8	34.45-34.46	381	900,476	43	32	2	8	-	-	14	1
507	3.6- 3.8	34.54-34.56	757	901,233	62	21	-	9	-	-	8	-
508	2.2- 2.4	34.80-34.81	378	901,611	-	-	-	56	-	-	44	-
509	2.2- 2.4	34.87-34.88	376	901,987	-	-	-	-	-	-	100	-
510	3.8- 4.0	34.54-34.56	749	902,736	50	22	-	10	-	-	18	-
511	1.8- 1.9	34.78-34.79	186	902,922	-	-	-	24	-	-	76	-
512	3.6- 3.8	34.94-34.96	744	903,666	-	-	-	-	-	56	44	-
513	-0.3--0.2	34.71-34.72	186	903,852	-	-	100	-	-	-	-	-
514	1.0- 1.1	34.78-34.79	186	904,038	-	-	-	-	-	-	100	-
515	1.7- 1.8	34.77-34.78	185	904,223	-	-	-	60	-	-	40	-
516	3.6- 3.8	34.90-34.92	735	904,958	-	-	-	18	-	35	47	-
517	3.4- 3.6	34.36-34.38	732	905,690	12	69	1	12	-	-	6	-
518	0.7- 0.8	34.69-34.70	183	905,873	-	-	45	-	7	-	-	48
519	2.2- 2.4	34.47-34.48	365	906,238	79	-	11	5	2	-	2	1
520	2.6- 2.8	34.74-34.75	361	906,599	-	-	-	60	-	-	40	-
521	2.4- 2.6	34.50-34.51	361	906,960	37	33	11	4	1	-	12	2
522	1.4- 1.5	34.76-34.77	179	907,139	-	-	-	38	-	-	62	-
523	1.1- 1.2	34.79-34.80	179	907,318	-	-	-	-	-	-	100	-
524	2.6- 2.8	34.66-34.67	358	907,676	-	-	-	64	-	-	36	-
525	2.4- 2.6	34.67-34.68	355	908,031	-	-	-	82	-	-	18	-
526	2.6- 2.8	34.73-34.74	354	908,385	-	-	-	61	-	-	39	-
527	3.8- 4.0	34.40-34.42	708	909,093	23	32	-	22	-	-	23	-
528	2.4- 2.6	34.65-34.66	353	909,446	-	1	-	81	-	-	18	-
529	3.2- 3.4	34.46-34.48	690	910,136	35	34	-	19	-	-	12	-
530	3.4- 3.6	34.88-34.90	689	910,825	-	-	-	21	-	46	33	-
531	1.8- 1.9	34.84-34.85	172	910,997	-	-	-	-	-	-	100	-
532	3.6- 3.8	34.42-34.44	688	911,685	32	29	-	20	-	-	19	-
533	2.6- 2.8	34.82-34.83	343	912,028	-	-	-	43	-	-	57	-
534	3.8- 4.0	34.38-34.40	683	912,711	15	59	-	13	-	-	13	-
535	2.2- 2.4	34.85-34.86	341	913,052	-	-	-	-	-	-	100	-
536	3.0- 3.2	34.36-34.38	681	913,733	56	28	1	10	-	-	5	-
537	2.4- 2.6	34.66-34.67	340	914,073	-	-	-	81	-	-	19	-
538	1.9- 2.0	34.84-34.85	170	914,243	-	-	-	-	-	-	100	-
539	3.2- 3.4	34.42-34.44	677	914,920	25	38	-	23	-	-	14	-
540	2.6- 2.8	34.70-34.71	337	915,257	-	-	-	55	-	-	45	-
541	1.2- 1.3	34.80-34.81	168	915,425	-	-	-	-	-	-	100	-
542	2.6- 2.8	34.86-34.87	335	915,760	-	-	-	-	-	-	100	-
543	3.2- 3.4	35.00-35.02	670	916,430	-	-	-	-	-	100	-	-
544	2.2- 2.4	34.81-34.82	334	916,764	-	-	-	14	-	-	86	-
545	3.4- 3.6	34.52-34.54	666	917,430	39	45	-	10	-	-	6	-
546	2.0- 2.2	34.80-34.81	332	917,762	-	-	-	49	-	-	51	-
547	2.8- 3.0	34.82-34.83	332	918,094	-	-	-	60	-	-	40	-
548	2.4- 2.6	34.70-34.71	331	918,425	-	-	-	77	-	-	23	-
549	3.4- 3.6	34.40-34.42	656	919,081	30	38	-	19	-	-	13	-
550	1.1- 1.2	34.75-34.76	164	919,245	-	-	-	55	-	-	45	-
551	3.8- 4.0	34.52-34.54	653	919,898	21	56	-	10	-	-	13	-
552	1.4- 1.5	34.82-34.83	163	920,061	-	-	-	-	-	-	100	-
553	3.4- 3.6	34.90-34.92	652	920,713	-	-	-	7	-	62	31	-
554	2.6- 2.8	34.90-34.91	319	921,032	-	-	-	-	-	-	100	-
555	0.0- 0.1	34.66-34.67	159	921,191	-	-	-	-	-	-	10	90
556	3.4- 3.6	34.50-34.52	631	921,822	38	46	-	8	-	-	8	-
557	1.3- 1.4	34.81-34.82	157	921,979	-	-	-	-	-	-	100	-
558	2.6- 2.8	34.67-34.68	312	922,291	-	-	-	58	-	-	42	-
559	3.6- 3.8	34.92-34.94	624	922,915	-	-	-	5	-	50	45	-
560	3.4- 3.6	34.46-34.48	623	923,538	47	29	-	9	-	-	15	-
561	3.4- 3.6	34.48-34.50	619	924,157	46	33	-	8	-	-	13	-
562	2.4- 2.6	34.73-34.74	309	924,466	-	-	-	66	-	-	34	-
563	2.8- 3.0	34.84-34.85	306	924,772	-	-	-	34	-	-	66	-
564	1.8- 1.9	34.86-34.87	153	924,925	-	-	-	-	-	-	100	-
565	3.0- 3.2	34.32-34.34	610	925,535	80	4	5	-	-	-	11	-

Rank	T°	S, ‰	Volume	Total Volume	N. Pac.	S. Pac.	So. O. Pac.	Ind.	So. O. Ind.	N. Atl.	S. Atl.	So. O. Atl.
566	3.2- 3.4	34.32-34.34	606	926,141	56	26	–	8	–	–	10	–
567	2.8- 3.0	34.77-34.78	302	926,443	–	–	–	74	–	–	26	–
568	2.4- 2.6	34.43-34.44	301	926,744	75	1	5	2	1	–	16	–
569	2.6- 2.8	34.39-34.40	300	927,044	69	2	8	4	–	–	17	–
570	3.4- 3.6	35.00-35.02	598	927,642	–	–	–	–	–	100	–	–
571	2.8- 3.0	34.79-34.80	298	927,940	–	–	–	66	–	–	34	–
572	2.0- 2.2	34.86-34.87	298	928,238	–	–	–	–	–	–	100	–
573	3.4- 3.6	34.44-34.46	594	928,832	31	31	–	17	–	–	21	–
574	1.8- 1.9	34.77-34.78	148	928,980	–	–	–	71	–	–	29	–
575	2.6- 2.8	34.63-34.64	296	929,276	27	1	–	32	–	–	40	–
576	1.0- 1.1	34.76-34.77	148	929,424	–	–	–	19	–	–	81	–
577	2.6- 2.8	34.89-34.90	295	929,719	–	–	–	–	–	–	100	–
578	1.7- 1.8	34.83-34.84	147	929,866	–	–	–	–	–	–	100	–
579	0.9- 1.0	34.75-34.76	147	930,013	–	–	–	33	–	–	67	–
580	2.8- 3.0	34.81-34.82	293	930,306	–	–	–	63	–	–	37	–
581	3.8- 4.0	34.50-34.52	583	930,889	36	49	–	6	–	–	9	–
582	1.5- 1.6	34.83-34.84	145	931,034	–	–	–	–	–	–	100	–
583	1.6- 1.7	34.59-34.60	144	931,178	94	–	1	–	4	–	–	1
584	2.6- 2.8	34.65-34.66	287	931,465	–	–	–	55	–	–	45	–
585	3.2- 3.4	34.40-34.42	573	932,038	25	56	1	9	–	–	9	–
586	4.0- 4.5	34.50-34.55	3,574	935,612	33	32	–	7	–	1	27	–
587	1.6- 1.7	34.84-34.85	141	935,753	–	–	–	–	–	–	100	–
588	2.8- 3.0	34.76-34.77	282	936,035	–	–	–	77	–	–	23	–
589	1.9- 2.0	34.78-34.79	141	936,176	–	–	–	46	–	–	54	–
590	2.8- 3.0	34.83-34.84	282	936,458	–	–	–	42	–	–	58	–
591	1.3- 1.4	34.76-34.77	140	936,598	–	–	–	27	–	–	73	–
592	1.5- 1.6	34.77-34.78	140	936,738	–	–	–	37	–	–	63	–
593	2.8- 3.0	34.78-34.79	278	937,016	–	–	–	66	–	–	34	–
594	2.2- 2.4	34.94-34.95	278	937,294	–	–	–	–	–	100	–	–
595	2.8- 3.0	34.80-34.81	278	937,572	–	–	–	57	–	–	43	–
596	3.2- 3.4	34.60-34.62	553	938,125	31	12	–	40	–	–	17	–
597	2.6- 2.8	34.68-34.69	276	938,401	–	–	–	51	–	–	49	–
598	3.2- 3.4	34.30-34.32	550	938,951	82	4	1	2	–	–	11	–
599	2.8- 3.0	34.41-34.42	275	939,226	42	29	1	15	–	–	12	1
600	1.7- 1.8	34.85-34.86	137	939,363	–	–	–	–	–	–	100	–
601	3.6- 3.8	34.46-34.48	548	939,911	42	43	–	7	–	–	8	–
602	3.8- 4.0	34.36-34.38	546	940,457	23	58	–	10	–	–	9	–
603	0.8- 0.9	34.75-34.76	136	940,593	–	–	–	17	–	–	83	–
604	2.6- 2.8	34.69-34.70	272	940,865	–	–	–	50	–	–	50	–
605	2.8- 3.0	34.35-34.36	272	941,137	70	4	5	2	–	–	17	2
606	2.6- 2.8	34.84-34.85	271	941,408	–	–	–	11	–	–	89	–
607	1.7- 1.8	34.78-34.79	135	941,543	–	–	–	21	–	–	79	–
608	2.4- 2.6	34.84-34.85	269	941,812	–	–	–	1	–	–	99	–
609	4.5- 5.0	34.50-34.55	3,356	945,168	33	31	–	2	–	7	27	–
610	1.4- 1.5	34.77-34.78	134	945,302	–	–	–	18	–	–	82	–
611	-0.7--0.6	34.64-34.65	134	945,436	–	–	–	–	–	–	–	100
612	2.4- 2.6	34.81-34.82	266	945,702	–	–	–	61	–	–	39	–
613	2.6- 2.8	34.97-34.98	266	945,968	–	–	–	–	–	100	–	–
614	1.6- 1.7	34.82-34.83	133	946,101	–	–	–	–	–	–	100	–
615	1.5- 1.6	34.81-34.82	133	946,234	–	–	–	–	–	–	100	–
616	3.6- 3.8	34.34-34.36	523	946,757	14	73	1	3	–	–	9	–
617	-0.3--0.2	34.69-34.70	129	946,886	–	–	10	87	3	–	–	–
618	2.6- 2.8	34.83-34.84	257	947,143	–	–	–	32	–	–	68	–
619	4.0- 4.5	34.35-34.40	3,210	950,353	18	52	–	16	–	–	14	–
620	3.6- 3.8	34.38-34.40	512	950,865	30	47	–	10	–	–	13	–
621	2.0- 2.2	34.84-34.85	256	951,121	–	–	–	–	–	–	100	–
622	0.8- 0.9	34.69-34.70	128	951,249	–	–	21	–	7	–	–	72
623	1.1- 1.2	34.77-34.78	128	951,377	–	–	–	13	–	–	87	–
624	3.6- 3.8	34.36-34.38	509	951,886	27	50	–	14	–	–	9	–
625	3.6- 3.8	34.58-34.60	509	952,395	50	21	–	14	–	–	15	–
626	3.6- 3.8	34.44-34.46	508	952,903	45	33	–	8	–	–	14	–
627	3.4- 3.6	34.24-34.26	508	953,411	70	1	5	–	–	–	24	–
628	2.8- 3.0	34.89-34.90	254	953,665	–	–	–	–	–	–	100	–
629	3.0- 3.2	34.38-34.40	507	954,172	27	51	–	18	–	–	4	–
630	3.2- 3.4	34.28-34.30	499	954,671	74	6	4	–	–	–	16	–
631	4.0- 4.5	34.55-34.60	3,116	957,787	40	31	–	4	–	3	22	–
632	3.6- 3.8	34.50-34.52	498	958,285	35	44	–	10	–	–	11	–
633	3.2- 3.4	34.34-34.36	498	958,783	33	46	–	13	–	–	8	–
634	2.2- 2.4	34.86-34.87	247	959,030	–	–	–	–	–	–	100	–
635	1.9- 2.0	34.79-34.80	123	959,153	–	–	–	25	–	–	75	–
636	3.0- 3.2	34.76-34.78	492	959,645	–	–	–	70	–	1	29	–

Rank	T°	S, ‰	Volume	Total Volume	N. Pac.	S. Pac.	So. O. Pac.	Ind.	So. O. Ind.	N. Atl.	S. Atl.	So. O. Atl.
637	1.4- 1.5	34.80-34.81	121	959,766	-	-	-	1	-	-	99	-
638	1.8- 1.9	34.80-34.81	121	959,887	-	-	-	48	-	-	52	-
639	2.6- 2.8	34.64-34.65	242	960,129	-	-	-	49	-	-	51	-
640	1.2- 1.3	34.78-34.79	121	960,250	-	-	-	9	-	-	91	-
641	1.4- 1.5	34.85-34.86	120	960,370	-	-	-	-	-	97	3	-
642	3.4- 3.6	34.26-34.28	478	960,848	75	7	1	2	-	-	15	-
643	0.4- 0.5	34.67-34.68	119	960,967	-	-	-	-	12	-	-	88
644	3.8- 4.0	34.34-34.36	476	961,443	33	57	-	6	-	-	4	-
645	1.4- 1.5	34.62-34.63	118	961,561	94	-	2	-	3	-	-	1
646	3.2- 3.4	34.36-34.38	468	962,029	22	61	-	13	-	-	4	-
647	3.0- 3.2	34.90-34.92	465	962,494	-	-	-	-	-	-	100	-
648	3.0- 3.2	34.78-34.80	464	962,958	-	-	-	58	-	12	30	-
649	3.0- 3.2	34.80-34.82	464	963,422	-	-	-	56	-	9	35	-
650	2.0- 2.2	34.83-34.84	232	963,654	-	-	-	19	-	-	81	-
651	1.3- 1.4	34.79-34.80	116	963,770	-	-	-	2	-	-	98	-
652	2.8- 3.0	34.75-34.76	231	964,001	-	-	-	76	-	-	24	-
653	3.0- 3.2	34.82-34.84	462	964,463	-	-	-	66	-	2	32	-
654	-0.7--0.6	34.66-34.67	114	964,577	-	-	-	11	-	-	-	89
655	2.8- 3.0	34.62-34.63	227	964,804	56	-	-	34	-	-	10	-
656	0.0- 0.1	34.65-34.66	113	964,917	-	-	-	-	4	-	-	96
657	3.8- 4.0	34.92-34.94	450	965,367	-	-	-	23	-	44	33	-
658	2.6- 2.8	34.72-34.73	225	965,592	-	-	-	43	-	-	57	-
659	5.5- 6.0	34.30-34.35	2,806	968,398	2	92	-	2	-	-	4	-
660	3.6- 3.8	34.88-34.90	444	968,842	-	-	-	20	-	25	55	-
661	3.8- 4.0	35.00-35.02	440	969,282	-	-	-	-	-	100	-	-
662	0.9- 1.0	34.74-34.75	110	969,392	-	-	-	65	-	-	35	-
663	3.8- 4.0	34.32-34.34	438	969,830	26	54	-	8	-	-	12	-
664	3.4- 3.6	34.38-34.40	437	970,267	26	45	1	7	-	-	21	-
665	3.2- 3.4	34.86-34.88	436	970,703	-	-	-	37	-	39	24	-
666	2.4- 2.6	34.85-34.86	217	970,920	-	-	-	-	-	-	100	-
667	2.8- 3.0	34.88-34.89	214	971,134	-	-	-	-	-	-	100	-
668	2.8- 3.0	34.74-34.75	214	971,348	-	-	-	76	-	-	24	-
669	4.5- 5.0	34.30-34.35	2,675	974,023	13	80	-	3	-	-	4	-
670	3.0- 3.2	34.62-34.64	426	974,449	23	-	-	61	-	-	16	-
671	3.0- 3.2	34.74-34.76	422	974,871	-	-	-	65	-	-	35	-
672	3.6- 3.8	34.48-34.50	422	975,293	39	41	-	9	-	-	11	-
673	3.0- 3.2	34.30-34.32	421	975,714	68	3	7	-	-	-	22	-
674	2.8- 3.0	34.34-34.35	208	975,922	62	4	8	2	-	-	22	2
675	3.2- 3.4	34.26-34.28	416	976,338	58	-	7	-	-	-	35	-
676	3.4- 3.6	34.86-34.88	414	976,752	-	-	-	32	-	19	49	-
677	5.0- 5.5	34.50-34.55	2,586	979,338	30	30	-	3	-	7	30	-
678	2.8- 3.0	34.87-34.88	203	979,541	-	-	-	-	-	-	100	-
679	3.4- 3.6	34.30-34.32	405	979,946	33	51	-	6	-	-	10	-
680	4.0- 4.5	34.30-34.35	2,513	982,459	25	67	-	4	-	-	4	-
681	1.0- 1.1	34.75-34.76	101	982,560	-	-	-	72	-	-	28	-
682	3.6- 3.8	35.02-35.04	402	982,962	-	-	-	-	-	100	-	-
683	3.8- 4.0	34.80-34.82	402	983,364	-	-	-	32	-	1	67	-
684	-0.3--0.2	34.70-34.71	100	983,464	-	-	100	-	-	-	-	-
685	2.8- 3.0	34.64-34.65	198	983,662	-	-	-	89	-	-	11	-
686	3.8- 4.0	34.42-34.44	395	984,057	38	37	-	18	-	-	7	-
687	3.4- 3.6	34.34-34.36	394	984,451	27	63	-	8	-	-	2	-
688	6.5- 7.0	34.35-34.40	2,456	986,907	3	94	-	1	-	-	2	-
689	3.4- 3.6	35.02-35.04	392	987,299	-	-	-	-	-	100	-	-
690	3.8- 4.0	34.44-34.46	392	987,691	36	49	-	7	-	-	8	-
691	4.0- 4.5	34.45-34.50	2,431	990,122	25	38	-	11	-	-	26	-
692	2.0- 2.2	34.50-34.51	194	990,316	62	-	11	10	15	-	-	2
693	2.8- 3.0	34.65-34.66	192	990,508	-	-	-	86	-	-	14	-