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Seneca Lake Meteorological and Surface Water Data

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15 January 1969

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ABSTRACT

This report presents meteorological and surface water data collected at Seneca Lake, N. Y. The meteorological data represent 33,899 data points collected from 1934 to 1968, and the surface water data represent 1,222 data points collected from 1967 to 1968.

ADMINISTRATIVE INFORMATION

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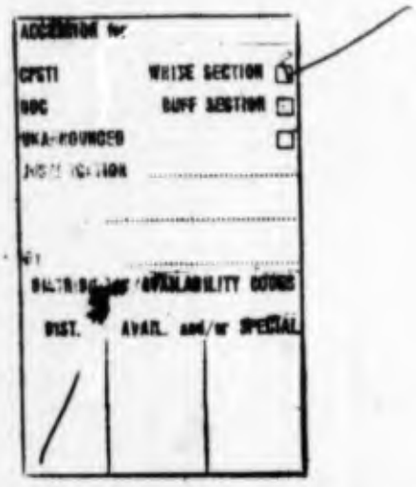

REVIEWED AND APPROVED: 15 January 1969

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INTRODUCTION

In the summer of 1967, the U. S. Navy Underwater Sound Laboratory was assigned the task of engineering, coordinating, and establishing an experimental Shore Based Test Facility at Seneca Lake, N. Y. This facility was needed to test large sonar arrays. A thorough knowledge of the area's meteorological conditions and lake surface characteristics were required in order to proceed intelligently with the floating platform design, mooring system design, and support system specifications. Consequently, a process of data collection and assimilation was begun. The results of that effort are presented in this report.

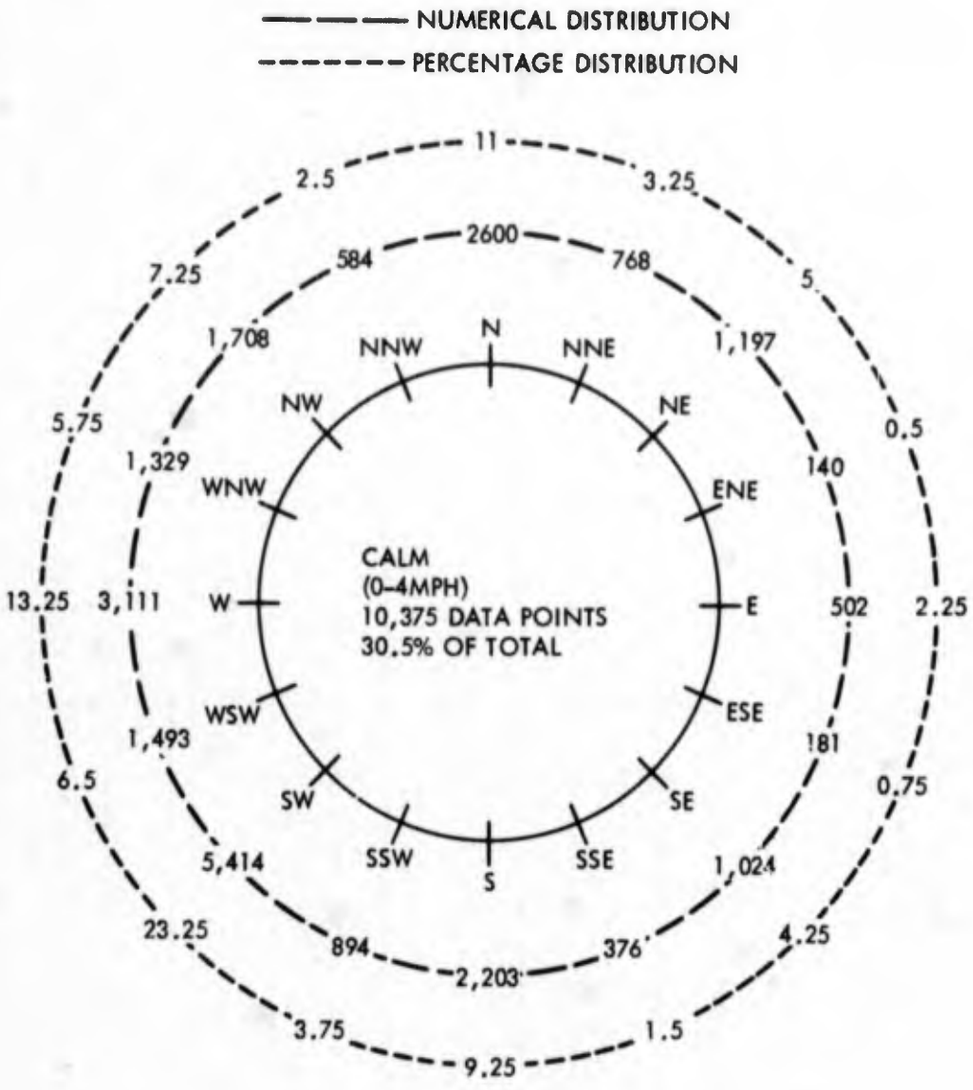
DESCRIPTION OF THE DATA

The meteorological data represent 33,899 data points collected from 1934 to 1968. Figure 1 shows that 30.5 percent (10,375) of the data points represent calm winds (that is, 4 mph or less). The remaining 69.5 percent (23,524) represent wind velocities greater than 4 mph, and 56 percent (13,115) of this remainder represent winds that blew from the SW quadrant. As shown in Figs. 2 through 5, the wind velocity data were subdivided into four other classifications: 4 to 10 mph, 10 to 15 mph, 15 to 25 mph, and 25 mph or greater.

The water surface data (1,222 data points) collected from 1967 to 1968 are presented in Fig. 6 and Tables 1 through 6. For example, 54 percent of the data points in Table 1 show that the wind direction was in opposition to the surface current direction.

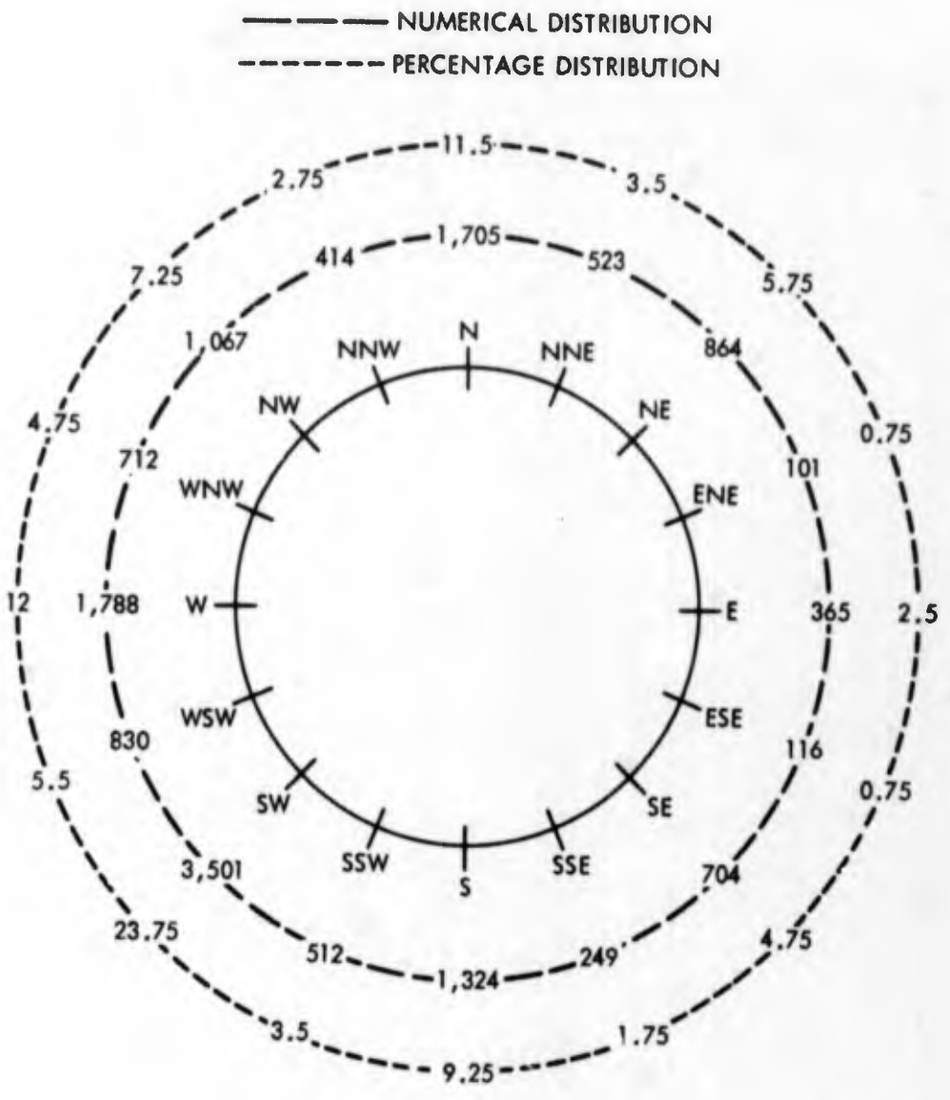
SUMMARY

The meteorological and surface water data included in this report is presented with the hope that, by adding to the knowledge of the area, the data may prove helpful to investigators faced with problems related to Seneca Lake.



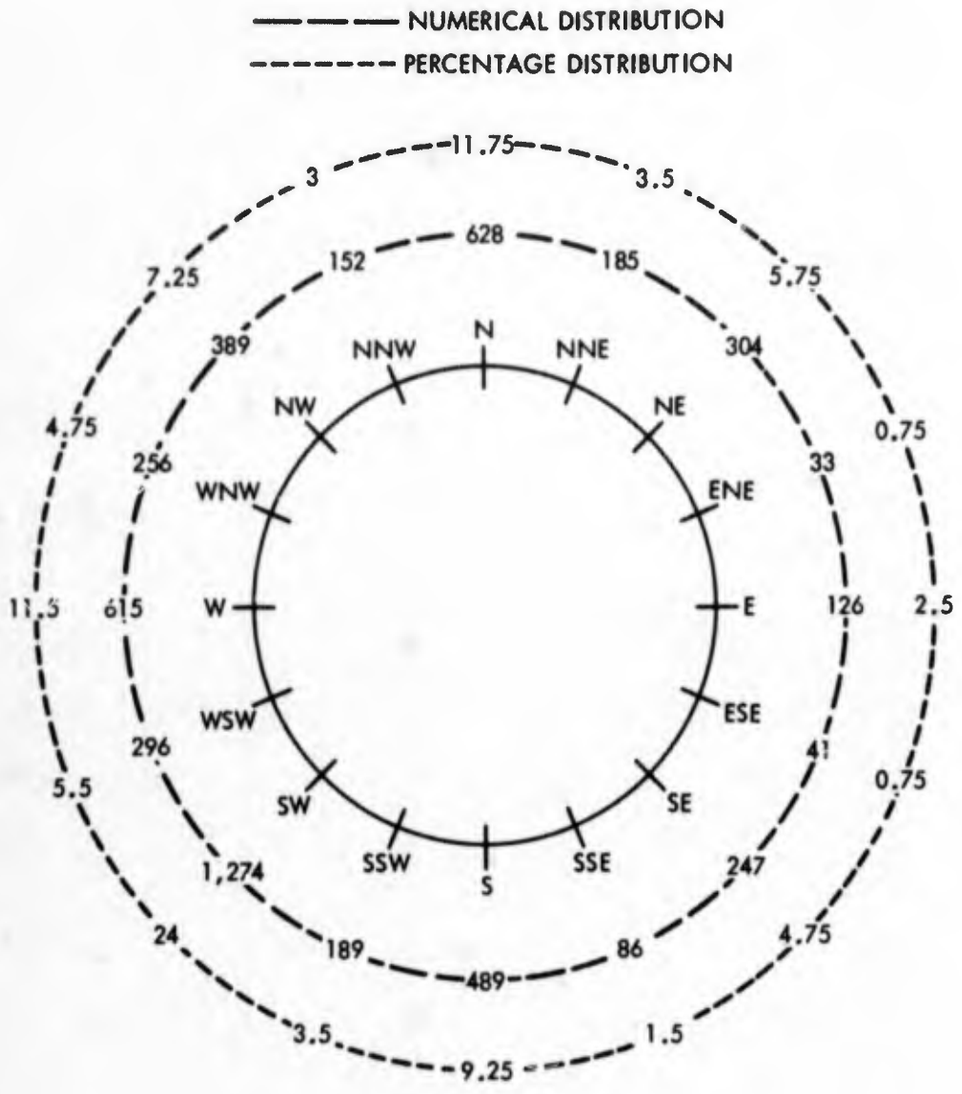
69.5% OF ALL DATA POINTS REPRESENT WIND VELOCITIES ≤ 4 MPH
56% OF THIS TOTAL REPRESENT WINDS FROM THE SW QUADRANT

Figure 1. Wind Rosette -- Velocity 0 to 4 mph or Greater (33,899 Data Points Collected from 1934 to 1968)



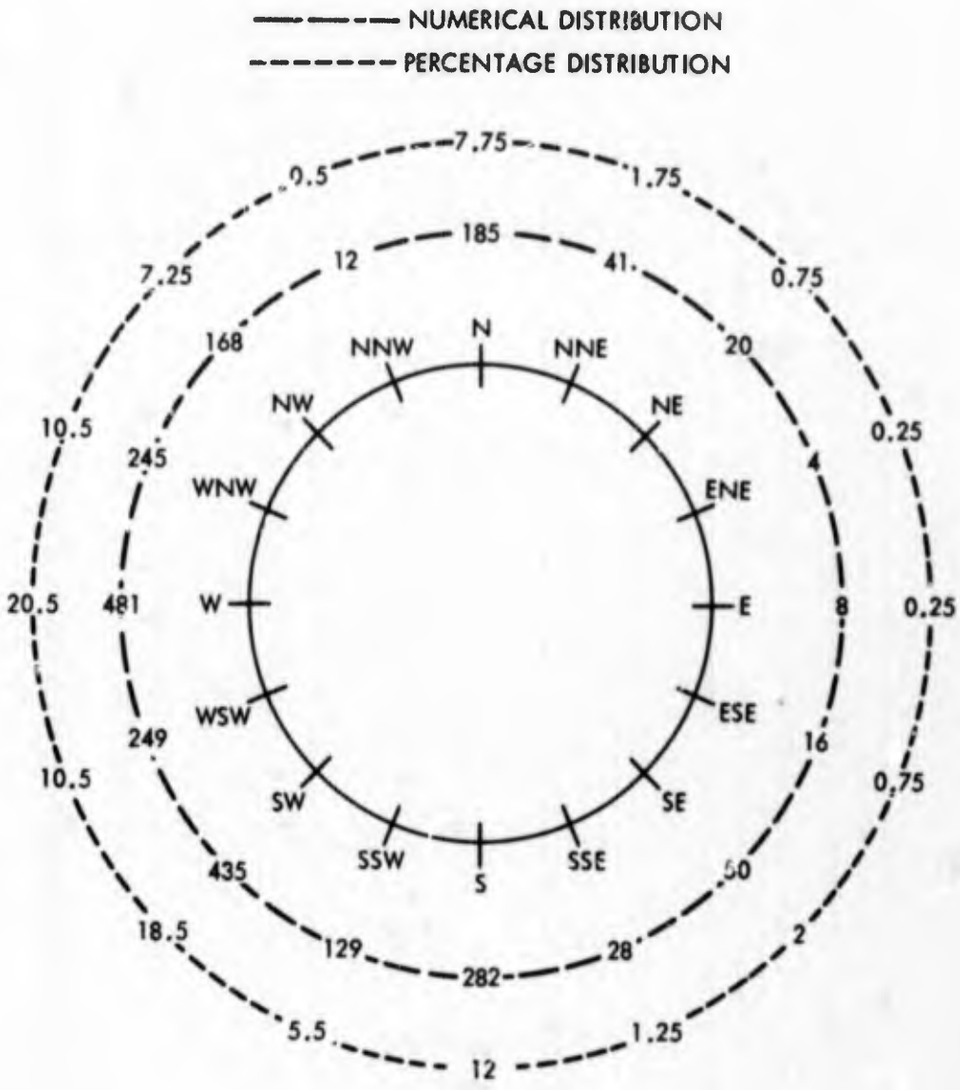
43.5% OF ALL DATA POINTS (33,899) REPRESENT WIND VELOCITIES OF 4 TO 10 MPH
54% OF THIS TOTAL REPRESENT WINDS FROM THE SW QUADRANT

Figure 2. Wind Rosette -- Velocity 4 to 10 mph (14,775 Data Points Collected From 1934 to 1968)



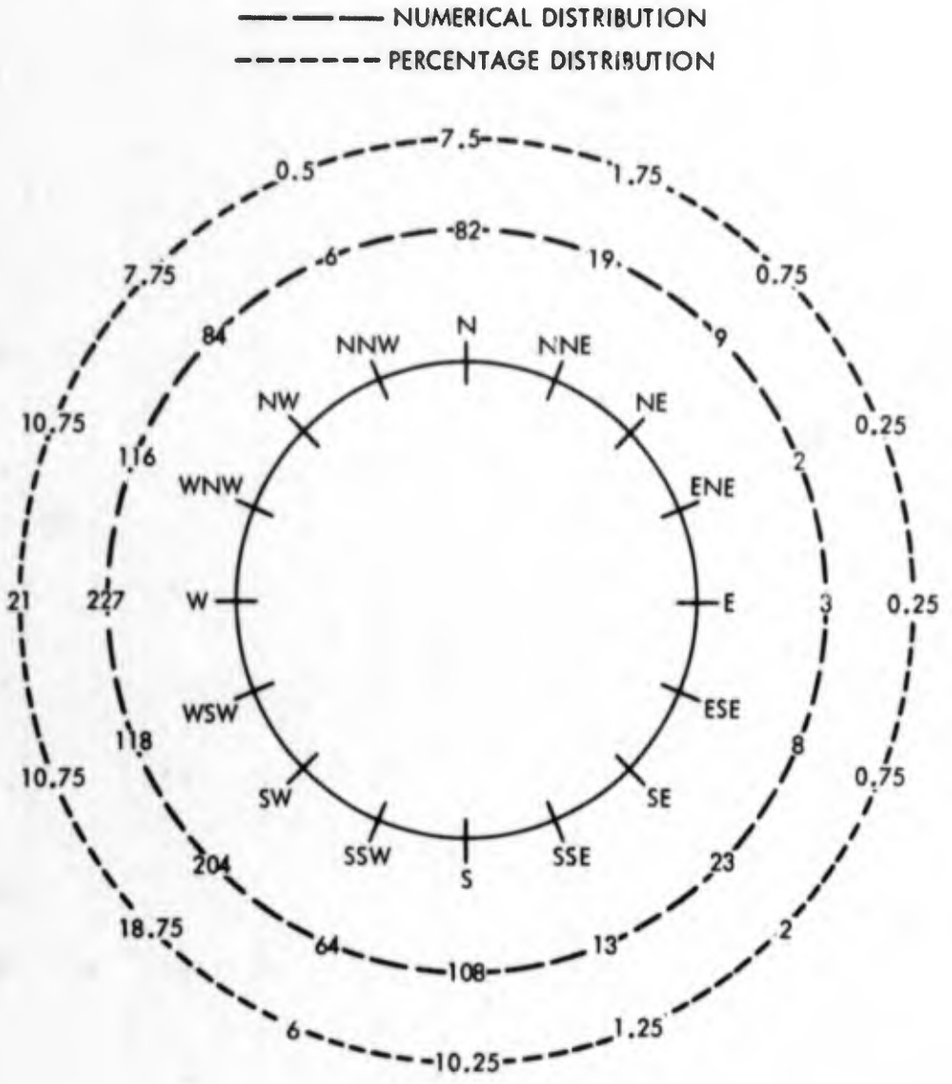
15.75% OF ALL DATA POINTS (33,899) REPRESENT WIND VELOCITIES OF 10 TO 15 MPH
53.75% OF ALL THIS TOTAL REPRESENT WINDS FROM THE SW QUADRANT

Figure 3. Wind Rosette -- Velocity 10 to 15 mph (5,310 Data Points Collected From 1934 to 1968)



7% OF ALL DATA POINTS (33,899) REPRESENT WIND VELOCITIES OF 15 TO 25 MPH
67% OF THIS TOTAL REPRESENT WINDS FROM THE SW QUADRANT

Figure 4. Wind Rosette -- Velocity 15 to 25 mph (2,353 Data Points Collected From 1934 to 1968)



3.25% OF ALL DATA POINTS (33,899) REPRESENT WIND VELOCITIES $\geq$ 25 MPH
66.75% OF THIS TOTAL REPRESENTS WINDS FROM THE SW QUADRANT

Figure 5. Wind Rosette -- Velocity 25 mph or Greater (1,086 Data Points Collected from 1934 to 1968)

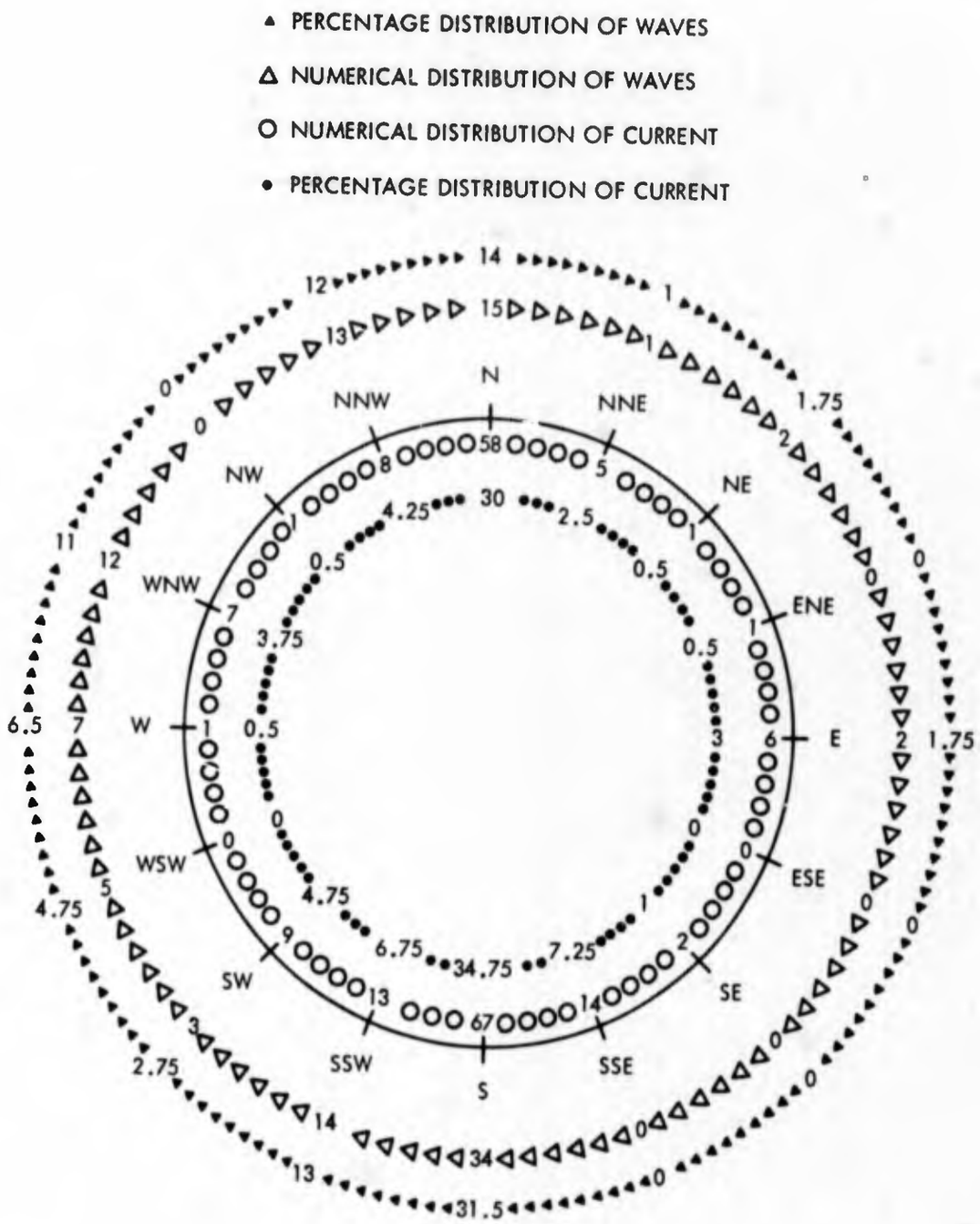


Figure 6. Wave and Current Rosette (1967 to 1968)

Table 1

WIND DIRECTION RELATIVE TO SURFACE CURRENT DIRECTION
(189 DATA POINTS COLLECTED FROM 1967 TO 1968)

Direction	Numerical Distribution	Percentage Distribution
Same	87	46
Opposing	102	54

Table 2

WAVE PERIOD
(166 DATA POINTS COLLECTED FROM 1967 TO 1968)

Period (waves/minute)	Numerical Distribution	Percentage Distribution
0 to 10	38	23
10 to 20	51	30.75
20 to 30	57	34.25
30 to 50	5	3
50<	15	9

Table 3

SURFACE CURRENT
(193 DATA POINTS COLLECTED FROM 1967 TO 1968)

Current (mph)	Numerical Distribution	Percentage Distribution
0 to 0.057	30	15.5
0.057 to 0.102	35	18.25
0.102 to 0.17	25	13
0.17 to 0.28	39	20.25
0.28 to 0.455	33	17
0.455 to 1.14	31	16

Table 4

SURFACE CURRENT VELOCITY AS A PERCENTAGE OF WIND VELOCITY*
(87 DATA POINTS COLLECTED FROM 1967 TO 1968)

$\frac{\text{Surface Current Velocity}}{\text{Wind Velocity}} \cdot 100\%$	Numerical Distribution	Percentage Distribution
0 to 2	51	59.25
2 to 4	18	19.75
4 to 6	12	14
6 to 8	3	3.5
8<	3	3.5

*Opposing directions have been disregarded.

Table 5

WAVE HEIGHT
(224 DATA POINTS COLLECTED FROM 1967 TO 1968)

Wave Height (ft)	Numerical Distribution	Percentage Distribution
<1	124	55.25
1 to 3	74	33
3 to 5	24	10.75
5<	2	1

Table 6

WAVE LENGTH
(62 DATA POINTS COLLECTED FROM 1967 TO 1968)

Wave Length (ft)	Numerical Distribution	Percentage Distribution
0 to 5	14	22.5
5 to 10	25	40.25
10 to 15	19	30.75
15 to 20	4	6.5

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This report presents meteorological and surface water data collected at Seneca Lake, N. Y. The meteorological data represent 33,899 data points collected from 1934 to 1968, and the surface water data represent 1,222 data points collected from 1967 to 1968.

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