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PATTULLO STUDY
School of Oceanography
Oregon State University
Corvallis, Oregon 97331

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SCHOOL OF SCIENCE OREGON STATE COLLEGE



NEHALEM R.
TILLAMOOK BAY

SILETZ R.

YAQUINA R.
OSC

ALSEA R.

SIUSLAW R.

UMPQUA R.

COOS BAY

COQUILLE R.

ROGUE R.

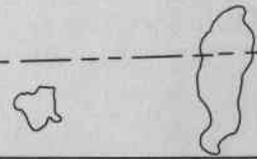
COLUMBIA RIVER

STATUS REPORT
Oregon Oceanographic Studies

Office of Naval Research
Contract Nonr 1286(02)
Project NR 083-102

Ref. 57-9
Dec. 1957

Wayne V. Burt
Bruce McAlister



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December 9, 1957

Mr. Gordon G. Lill, Head
Geophysics Branch
Code 416
Office of Naval Research
Washington 25, D.C.

Reference: Office of Naval Research
Contract Nonr 1286(02)
Project NR 083-102

Dear Mr. Lill:

This is a status report as of this date for the above contract. The nature of the work undertaken in terms of the contract has included current research and preparation of papers and reports for publication. This includes, but is not necessarily limited to, the following:

I Research in Progress.

1. Quarterly surveys of the Oregon coastal estuaries is proceeding as a continuing program. The Coos, Siuslaw, Umpqua, Alsea, Siletz, Netarts, Tillamook, Nehalem, and Columbia estuaries are sampled quarterly. The Yaquina estuary is sampled twice monthly. At present, temperature, salinity, and dissolved oxygen are measured in all estuaries, with additional measurements of pH in the Yaquina. It is hoped to extend the testing program in the Yaquina to include phosphate and lignin analysis in the near future.
2. The extensive measurement in the Yaquina will be used to isolate the pertinent factors involved in the observed distribution of properties. Preliminary analysis indicates that the distribution within the estuary may be reasonably described by a single set of measurements at one station during the time that the estuary remains reasonably vertically homogeneous. As the investigations extend throughout the year, it should be possible to describe the behavior of the system in terms of tides and precipitation. These figures in turn may be used to explain the distribution of various organisms in the estuary, such as clams and oysters, in terms of hydrographic factors.

3. The annual cycle of oxygen distribution in the Yaquina is being observed. Additional observations for comparison are being made in the surf waters. There has been some indication that the coastal waters may be markedly deficient in oxygen at times during the winter. If the deficiency can be verified, we will attempt to determine the extent and duration of the low oxygen conditions. This possible natural oxygen deficiency may be important in limiting the potential of some of the estuaries for oxidizing industrial pollutants.
4. Oxygen data obtained previously in Coos Bay by John Queen and additional data acquired on the present investigation is being analysed to provide an estimate on the diurnal variation in dissolved oxygen in estuaries. The dissolved oxygen will vary both with the tidal circulation and biological activity. Under appropriate conditions, dissolved oxygen content at the same station has been found to vary from 4.0 to 8.0 ml/l during the course of the day. The results will be presented as a technical report.
5. When the paper "A Light Scattering Diagram" was published in the Journal of Marine Research a year ago, the editor requested a paper to follow it that would pinpoint the scattered light into forward and backward components. At that time, the necessary, very-involved computations were not available for using the Mie Theory to predict the two scattering components over a wide range of conditions. Since then, the necessary basic computations have been run off on the high speed computer at the University of Michigan. We have obtained a part of the new computational results. As soon as the rest are received, we will endeavor to determine the value of the two components over a wide range of particle sizes, wave length of light, and relative refractive indexes. We intend to make use of the college digital computer to shorten the computational-time.

II Reports and Papers Published.

1. Reprints of the two short papers, "On the Attenuation of Light in the Sea" and "Tidal Over-Mixing in Estuaries", were sent out to your distribution list this week.
"Selective Transmission of Light in Tropical Pacific Waters" and "Flushing of Pollutants in the Yaquina River Estuary", each of which are now running to about ten pages, are in press this month. The first will appear in Deep-Sea Research, and the second in Sewage and Industrial Wastes. Reprints will be sent out to your distribution list when they come in.

III Reports and Papers in Preparation.

1. The article comparing mid-latitude storms to hurricanes which was mentioned in the last status report is still in limbo. The last court to rule on the ship loss (November 1957), which

started the study, ruled that the ship was unseaworthy simply because other ships in the area survived and it didn't. This was in the face of overwhelming evidence that the storm in question was of almost unprecedented violence for storms anywhere. Now the case, involving several million dollars, will probably go to the Supreme Court and we may have to wait until afterwards to submit the paper for publication.

2. "Recent Studies in the Hydrography of Oregon Estuaries", a general descriptive paper describing our work here, is in final draft form for submission to the Oregon Fish Commission for publication in their series of publications.
3. At the request of Dr. Thomas G. Thompson of the Department of Oceanography of the University of Washington, a short paper, "Activities in Oceanography at Oregon State College" was prepared for consideration for publication in the Proceedings of the 9th Pacific Science Congress.
4. The analysis of data from Silver Bay, Alaska, has been completed, and several papers, including Mr. McAlister's work describing the physical oceanography of Silver Bay, are being prepared for publication. These publications will be joint contributions from the Department of Oceanography of the University of Washington and this contract.
5. "A Note on the Microclimate of the Oregon Coast" was rejected for publication in the Bulletin of the American Meteorological Society on the basis of too few data. Please destroy the draft you have in your files.

IV Meetings.

1. Mr. McAlister attended the Symposium of Research on problems relating to water pollution in the Pacific Northwest at Portland on November 7, 1957, and the Pacific Northwest Regional Meeting of the American Geophysical Union at Pullman October 28, 29, 30, 1957.

Very truly yours,

Wayne V. Burt
Associate Professor of Oceanography

Bruce McAlister
Research Associate in Oceanography

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