

ences between the spring and neap tides, and the disturbing effect of such exceptional conditions as may occur during that time. The under currents should be determined as well as the surface currents, so that the total amount of water which enters or leaves the Gulf area by these openings may be ascertained. The volume discharged by the St. Lawrence may be taken into account, although a very slight movement of the waters at these large openings would more than make up for it. In this way some general basis will be obtained for the survey of the currents in the interior of the Gulf.

The sum required to carry out this work during the fiscal year 1894-1895 is shown in the estimate which I beg to append below; and I believe that to carry out the work as outlined and estimated in this report, is the most efficient and economical way of carrying on this survey from the position it has already reached.

COMPLETION OF THE SURVEY.

The time required for the survey of the currents on both the Atlantic and Pacific coasts will be about six or eight years, on the basis of an annual expenditure as indicated; and the average annual cost should be fully covered by the amount of the present estimate, with the exception of the sum allowed for the use of the steamer, which in future years should be available for the full season. With this proviso, it will be possible in the time stated to survey the currents in the open waters traversed by the ocean-going vessels, and on the main routes leading to our principal harbours; but it does not contemplate an examination in detail of the currents in the less important bays and straits. The amount of the estimate also includes the additional tide gauges to be established in the first two seasons in advance of the survey of the currents in each region. The margin corresponding to this in later years can be used to carry forward the tidal work, until the completion of the survey of the currents; when the remaining tidal work can be completed satisfactorily on the basis of a much reduced expenditure.

SUMMARY.

The following summary may be given in conclusion, with special reference to the work for the coming season:—

1. The representations made in past years have shown the imperative need of obtaining full information as to the tides and currents in Canadian waters; and this is now generally admitted and recognized.
2. A practical commencement has been made by the erection of five tide gauges now in operation experimentally, and also by the publication of tide tables for the port of Halifax by this department.
3. It is now proposed to complete a series of tide gauges required in the Gulf, and on the Atlantic coast; and also to commence the Survey of the currents in the Gulf of St. Lawrence.
4. The credit of \$10,000 voted by Parliament, was for the erection of tide gauges and the reduction of the tidal observations; and did not include provision for the Survey of the currents.