

SOUTH PACIFIC COMMISSION

ELEVENTH REGIONAL TECHNICAL MEETING ON FISHERIES
(Noumea, New Caledonia, 5 - 10 December 1979)

AERIAL RADIOMETRY AND TUNA PROSPECTION

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SUMMARY

A surface temperature measurement programme by infra-red aerial radiometry was launched in February 1979. A low flight altitude (under 150 metres i.e. 500 feet) further allows visual detection of tuna and marine mammal schools. These two operations are closely connected, since tuna migratory patterns and physiology are to a great extent determined by sea temperature and the highest fish concentrations are found close to zones of sharp temperature change. Firstly, it would appear that migratory tuna species do not travel in fixed directions but rather follow routes determined by the movement of water masses and, secondly, that limited stocks of non-migratory tuna are associated with thermic anomalies caused by islands and banks. An aircraft equipped with a radiometer thus seems highly suitable for detecting probable tuna zones, provided that it does not fly at random or is bound by a pre-determined and inflexible geometric flight plan. The plan must be drawn up on the basis of all available data on the tuna ecosystem, updated as a result of each flight. Such a body of processed data makes it possible to determine the most likely tuna populated sea areas. Many different parameters affect the preparation of a flight plan: thermic data from geostationary meteorological satellites, long-established and recent hydrological data, fisheries statistics, bathymetry and meteorological data. Interpretation of thermic data collected from the air and visual detection both require some practice. Observations confirmed the presence of dense populations of yellowfin and skipjack in sharply contrasting water masses. Their detection from the air enabled the two oceanographic vessels subsequently despatched to survey the area with maximum efficiency. In conclusion, considering the extremely interesting results obtained to date (almost 400 flying hours) we are confident that, both for oceanography and for commercial fisheries, aerial radiometry is fully justified in the south-west Pacific region.

1550/79