
MINERALS ABSTRACTS

CRONAN, D. S., Marine Mineral Resources Programme, Imperial College,
London, England, United Kingdom

Potentially Economic Manganese Nodule Deposits in Western Equatorial Pacific

Manganese nodules of principal mining company interest are located in the so-called Clarion-Clipperton zone in the northeastern equatorial Pacific where the following environmental conditions prevail: (1) biological productivity in the surface waters elevated to 50-100 grams of carbon per square meter per year ($\text{g}/\text{m}^2/\text{year}$); (2) sea-floor depth near or below the calcium carbonate compensation depth (CCD); and (3) an absence of turbidite sedimentation.

Relevant data for the western equatorial Pacific indicate that these conditions are fulfilled in parts of this region also. First, biological productivity is sufficiently elevated to promote high-grade nodule formation more or less symmetrically across the equator in a wedge widening from the equator near the Gilbert Islands to more than lat. 10°N at the Line Islands. Second, much of this high productivity area, especially in the west, is below the CCD. Third, away from the island groups, turbidite sedimentation should be minimal. These observations indicate that the central Pacific basin should contain areas where conditions are conducive to the formation of potentially economic nodules. Parts of these areas fall within the Exclusive Economic Zones of island nations of the region.

Analysis of the limited available nodule data for the western equatorial Pacific confirms that high-grade and occasionally abundant nodule deposits are present in areas predicted by the above criteria. Therefore, areas of potential prospectivity can be defined for the region, which should serve as a basis for future prospecting there for manganese nodules.