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SECTOR 1 — CHART INFORMATION

# SECTOR 1

## ISLANDS BETWEEN MINDANAO AND SULAWESI (CELEBES)

**Plan.**—This sector describes Pulau Miangas, Kepulauan Nenusu, Kepulauan Talaud, Kepulauan Kawio, and Kepulauan Sangihe in that order.

### General Remarks

**1.1 Winds—Weather.**—The monsoons blow more steadily and with greater strength in the Molucca Passage than in the Celebes Sea. High winds and squalls are not common. Very rarely a tropical cyclone passes to the N and causes strong winds and swells in the passage.

From December to February the winds blow from the N, chiefly, but occasionally from the NW. This monsoon is well developed and reaches its greatest strength in February. In March N winds continue to prevail. In April the winds are lighter, mostly from the N, but veering to the E at times.

Southwest winds set in during May. By June the E monsoon has become established, with its prevailing direction from the S and SSE. The E monsoon blows with somewhat greater strength and steadiness than the W monsoon in this area. During July, August, and September the prevailing winds are S and SW. The greatest strength of E monsoon is reached in August.

During October the prevailing winds continue from the S and SW, becoming more variable than in September, with some N breezes.

November is the transition month, during which the winds are light and variable, becoming N by the close of the month. In December the W monsoon is well established with winds from the NW and NNW.

In general, there is more clear sky and favorable weather during the W monsoon than in the first part of the E monsoon season. However, by August the dry season has set in continuing through October, with small cloudiness but a considerable amount of haze.

### Tides—Currents

Lack of information prevents a detailed discussion of the tidal currents of this area, although knowledge of the vertical movements of the tides is now well established.

Though both the vertical and horizontal movements are due to the same cause, it is useless to attempt to predict the characteristics of one from those of the other.

Attention is called, however, to the fact that the strong tidal currents in the various straits are caused by waters piling up at the entrances to the passages.

### Caution

When navigating through this area, one should bear in mind that it is subject to volcanic eruptions. For instance, in 1922, a

submerged volcano was reported 75 miles WNW of **Pulau Sangihe** (3°33'N., 125°33'E.), and in 1892, a tremendous eruption of Awu volcano on Pulau Sangihe occurred. The volcano on **Pulau Ruang** (2°18'N., 125°22'E.), one of the S most islands of Kepulauan Sangihe, has often caused great damage.

Numerous fish traps exist in the areas W of Kepulauan Sangihe.

### Off-lying Islands

**1.2 Pulau Miangas** (Palmas) (5°34'N., 126°35'E.), an isolated island about 75 miles E of Tinaca Point, the S end of Mindanao, is mostly low and covered with coconut palms, the land being only about 1.5m above high water (See Pub. 162, Sailing Directions (Enroute) Philippine Islands). The NE part rises to a series of hills, the highest of which is 111m high at Gunung Batu. The NE corner is a sheer steep-to cliff 46m high.

The island is surrounded by a wide reef extending up to 0.2 mile from the N and E sides. The edge of the reef is very steep-to, except on the SE side.

A break in the reef in front of the village of Miangas on the SW shore is the best and practically the only landing place for small boats. The beach near the village is sloping and consists of sand and coral; there are numerous rocks near the beach.

The island has been sighted visually from a distance of 25.5 miles and picked up on radar from a distance of 24.5 miles.

Miangas Light is exhibited from a white framework tower on Mount Gunong; a racon is located at the light.

Baronto Island, an islet 12.8m high and covered with coconut palms, is on the fringing reef about 183m SE of the S extremity of Pulau Miangas. Foul ground extends about 183m S from the islet.

**Tides—Currents.**—As far as is known Pulau Miangas is in an area where a constant SW to SSW current may be expected, with a last-known maximum velocity of 2.5 knots. A strong S current splits on the bank close N of the island causing dangerous rips and whirlpools in that vicinity, and a considerable eddy to the S. The mean range of tide is reported to be 1.1m.

**Anchorage.**—A recommended anchorage for moderate-sized vessels is within the N extremity of Baronto Island bearing 248° and the E extremity of Pulau Miangas bearing 023°; this anchorage is clear of strong current, but further out the velocity is about 3 knots; when anchored in depths of less than 29m the vessel is clear of the current, but is subject to eddies and tide rips.

A more difficult anchorage offering protection from NE swell is available off the break in the reef in front of the village of Miangas, about 183m from the boulder line in 31m. This anchorage is dangerous because the rapidly shoaling bottom forces a vessel to lie very close to the reefs.

## Kepulauan Nenusu

**1.3 Kepulauan Nenusu** (Nanusa) (4°45'N., 127°08'E.), consisting of a group of seven islands, is about 52 miles SSE of Pulau Miangas and 17 miles NE of Kepulauan Talaud. All of the islands are hilly and wooded; the only bare spot is the summit of Pulau Merampit (Marampit), the largest and highest of the group, rising to 165m. The most conspicuous point is the 106m conical peak on Pulau Kakolotan (Kakaroetan).

Pulau Merampit, Pulau Karatung, and Pulau Kakolotan are inhabited. Pulau Intata and Pulau Kakolotan are on the same reef which dries, at the S end of the group. Ondengbui, a flat bare rocky islet, is on the outer edge of this reef close N of Pulau Intata. There are also some rocks between Pulau Intata and Ondengbui. Pulau Malo, a low island SW of Pulau Kakolotan, is fringed by a wide reef which dries.

Good drinking water is available only at Pulau Merampit.

The water around the islands is very clear; the bottom, consisting mostly of sand and stones, can sometimes be seen at a depth of 29m.

A light is exhibited on the N side of Pulau Karatung. It was reported that Pulau Malo was a good radar target at a distance of 19 miles.

**Anchorage.**—Good anchorage may be obtained by vessels with local knowledge during the NW monsoon, S and SE of the village of Karatung on the E side of Pulau Karatung. During the SE monsoon there is anchorage off the N side of that island.

Vessels with local knowledge may obtain anchorage off the SW extremity of Pulau Merampit, although the depths are great and the bottom steep; the depths are too great off the villages of Merampit and Lalune on the S side of the island.

Good anchorage may also be obtained by vessels with local knowledge, in depths of 49m N of the reefs on the W side of Pulau Kakolotan. During the NW monsoon vessels lie better S of the passage between Pulau Kakolotan and Pulau Malo, or S of Pulau Malo.

**Caution.**—An 8.8m shoal is about 1 mile N of Pulau Karatung, and is well marked by discoloration under favorable conditions. Napu Arampua (Napoe Arampoea), a 3m shoal, is 4 miles S of Pulau Karatung. The passage between Pulau Kakolotan and Pulau Malo is encumbered with reefs and should not be used.

A shoal, with a depth of 28m, lies about 2 miles S of Pulau Kakolotan.

## Kepulauan Talaud

**1.4 Kepulauan Talaud** (4°08'N., 126°46'E.) consists of Pulau Karakelong, Pulau Salebabu, and Pulau Kaburuang, all thickly wooded and inhabited islands, about 20 miles SW of Kepulauan Nenusu. The coasts are mostly steep and rocky, interrupted in places by small sandy beaches or marshy flats.

The villages on these islands are almost exclusively on the coast. Agriculture, coconut cultivation, and fishing are the main industries. Copra and lumber are exported.

**Tanjung Ambora-besar** (4°33'N., 126°45'E.), marked by a light, exhibited at an elevation of 42m, and on which a conspicuous tree was reported to stand, is the N extremity of

Pulau Karakelong, the largest and N most of the group. In the N and wider half there is a ridge running in a N-S direction, with Gunung Duata, the summit 680m high, about 15 miles from Tanjung Ambora-besar, and Berawang, 480m high and prominent, about 7 miles from the same point. The island's coasts are generally steep-to, except on the S side where a bank encumbered by reefs joins it to Pulau Salebabu. The coastal reef is mostly narrow and steep-to and the least swell causes heavy breakers on it.

**Teluk Esang** (4°28'N., 126°43'E.), about 4.75 miles SSW of Tanjung Ambora-besar, has low shores and a village at its head. Good anchorage may be obtained in a depth of 46m, with the N entrance point of the bay bearing 002°, at a distance of 0.8 mile.

Batumbalango Bay, about 5 miles SSW of Teluk Esang, affords anchorage on its N side in depths of about 31m.

Fair anchorage is also available at Meriri Bay, close S of Teluk Esang, and in Teluk Ambia, close N of Batumbalango Bay.

Nusa Dolong, an islet, is about 0.75 mile offshore close NW of Tanjung Labo, about 6 miles S of Batumbalango Bay, near the middle of the W coast. A prominent white tombstone is on the islet. Nusa Topor, another islet, is about 1 mile SSE of Nusa Dolong. Reefs extend from both of these islets, and a 1.8m shoal is about 0.3 mile WSW of Nusa Topor.

**Beo** (4°14'N., 126°47'E.) (World Port Index No. 52480), at the S end of Teluk Beo, about midway along the W coast of Pulau Karakelong, is the principal settlement of the island.

A light is shown from a pole 118m NW of the village flagstaff. A conspicuous tree stands on the coast about 0.25 mile SW of Beo and is visible from seaward.

A pier, about 130m long, which is almost dry at HW, extends from the shore at the village. A coral and mud bank is W of the pier and two detached reefs are on the coastal bank, 0.75 mile and 1.5 miles, respectively, NNW of the pier.

Recommended anchorage is about 1 mile NW of the jetty. Anchorage may also be obtained in 69m on a line with the prolongation of the pier and the ascending road behind it, but the bottom is very steep. Both of these anchorages are unsheltered from SW through NW.

On the N coast a serviceable anchorage is off Kampung Mamahan in a small cove close E of Tanjung Ambora-besar. With local knowledge, vessels can anchor in Bambang Bay, entered close SW of Tanjung Masareh.

On the E coast anchorages can be found at Gemeh and Arangkaa, 5 miles and 6.5 miles, respectively, ESE of Tanjung Ambora-besar. Amat village and Toa Batu village, 3 miles and 6 miles, respectively, S of Arangkaa, also offer anchorage.

**1.5 Selat Lirung** (3°58'N., 126°41'E.), the strait separating Pulau Karakelong and Pulau Salebabu, is 1.5 miles wide at its narrowest point.

**Anchorage.**—The only safe year-round anchorage is off Kampung Kiama, close E of Tanjung Dapapat. A 3m shoal is about 1 mile offshore of this anchorage.

**Caution.**—Several shoals and two islets, Sara-kechil and Sara-besar, are in the S part of Selat Lirung. Napu Mapoa, a 7.6m shoal, is about 2 miles NW of Sara-kechil. Several other

shoals of 7 to 18m are between Napu Mapao and Sara-kechil. Shoal patches of 2.7 to 7.8m extend about 1.5 miles NE from Sara-besar. A 3m shoal is about 0.5 mile off the S side of Pulau Karakelong and about 2.75 miles NNE of Sara-kechil.

A disturbed sea is usually N of the N entrance to the strait, even when it is calm elsewhere.

**1.6 Pulau Salebabu** (3°56'N., 126°40'E.) about 15 miles long, is close SW of Pulau Karakelong. A mountain ridge runs through the entire length of the island with several prominent peaks; Ajambanna, which rises to 366m is the highest and is in the middle of the island. This area is readily recognized by its saddle-like formation. It is surrounded by a very narrow shore reef, which widens out somewhat at the N end and on the S half of the E coast.

The W coast is rocky and steep with projecting rocky points. The villages on the island lie on the E coast.

**Kampung Lirung** (3°56'N., 126°42'E.) (World Port Index No. 52490) is on the NE coast of Pulau Salebabu. Good anchorage, safe during both monsoons, can be obtained off the town in a depth of about 29m, with the flagstaff of the village bearing 214°. The best landing, free of rocks, is on the sandy beach near the flagstaff.

**Tides—Currents.**—At Selat Lirung there is both a diurnal and a semidiurnal tide, but the latter predominates. Neither the spring highs nor the spring lows of the two tides coincide. The highest water level occurs in April or May and in October or November, the lowest in January or February and in July or August. The maximum rise and fall that can be expected are, respectively, about 0.9 above and 0.9m below mean sea level.

The currents caused by the semidiurnal tides set NW along the coast around HW and SW around the coast around LW; they can attain a velocity of 2 to 3 knots.

**Anchorage.**—Salebabu Anchorage is in a small bay about 4.5 miles S of Kampung Lirung. The greater part of the bay is encumbered by a reef that extends from the shores on all sides. Limited anchorage is in a clear space in the middle. Vessels can also anchor off the bay in 29 to 49m with Kampung Salebabu, at the NW corner of the bay, bearing about 304°. This is clear of the shoals fronting the shores in the approach to the bay. With E and SE winds some shelter is obtained from Pulau Kaburuang, and complete shelter is obtained during the N monsoon.

During NE winds vessels will find anchorage in Teluk Sereh at the village of Sereh in the middle of the W coast of Pulau Salebabu; however, the depths here are 49 to 101m.

Anchorage is also off the village of Kampung Kalongan on the W side of Pulau Salebabu, about 1.25 miles SE of Tanjung Salonggan, the N extremity of the island. This anchorage has depths of 40 to 49m, but it is only sheltered from E winds. A 5m shoal is 0.35 mile W of the rocky point N of the village.

**1.7 Selat Kaburuang** (3°50'N., 126°43'E.), between Pulau Salebabu and Pulau Kaburuang, is about 2.25 miles wide at its narrowest part and is clear except for a 4m shoal 1.25 miles WSW of the N end of Pulau Kaburuang.

**Tides—Currents.**—Strong currents have been experienced in Selat Kaburuang.

**Pulau Kaburuang** (3°47'N., 126°47'E.), the S most island of the group is 8.5 miles long, and has two conspicuous summits,

Gunung Padian, 405m, and Gunung Towoa 481m high, respectively. The coast is generally rocky, but broken in places by sandy beaches. The coastal reef is narrow and steep-to. A 4m patch lies 1.25 miles WSW of the N point of the island; a 2.7m shoal is close off Kampung Peret, a village 1.25 miles NW of the S end of the island.

**Anchorage.**—While there are no recommended anchorages along the coast of this island, vessels can find anchorage in calm weather, but depths of more than 82m will be found more than 91m from the edge of the coastal reef.

**Napu Mbalu** (Saaru) (Northumberland Reef), 6 miles SSE of Pulau Kaburuang, is a small islet about 1.8m high composed of coral. It is surrounded by a reef with drying rocks. A conspicuous stranded wreck is situated on the islet.

## Kepulauan Kawio

**1.8 Kepulauan Kawio** (4°35'N., 125°35'E.), consisting of Pulau islands, Pulau Marore, Pulau Kawio, Pulau Kemboling, Pulau Memanuk, Pulau Matutuang, Pulau Kawalusu, and Pulau Dumarehe, lies between 4°13'N and 4°45'N, and between 125°19'E and 125°42'E. Pulau Marore, Pulau Kawio, Pulau Kemboling, and Pulau Kawalusu are inhabited; the others are visited from time to time by copra-gatherers or fishermen. The inhabitants are engaged mainly in fishing and agriculture.

**Tides—Currents.**—During October and November a SSW current will be experienced in the vicinity of the islands. The velocity, but not the direction of the current, is affected by the tides. The velocity varies between 0.5 and 2.5 knots near the islands.

**Caution.**—Most of the islands are surrounded by fringing reefs. Pulau Marore and Pulau Kawalusu appear to be steep-to in places.

**1.9 Pulau Marore** (4°44'N., 125°29'E.), the N most island of the group, is 140m high at its N end and appears as two islets when approached from E. A light with Racon is exhibited at an elevation of 180m on the summit of the island. Batu Bawaikang, four rocks, the W most of which is 35m high, are close off the N point of the island. Anchorage can be obtained off a small village at the SW end, but tidal currents may be troublesome.

Pulau Kawio and Pulau Kemboling, 5 miles SW of Pulau Marore, are less than 0.25 mile apart and are connected by a drying coral reef. Pulau Kemboling is 108m high.

**Tides—Currents.**—Strong tidal currents are in the vicinity of the islands.

**Anchorage.**—Anchorage has been found on the W side of the islands, W of the opening between the two, in 37m, coral, with the SW point of Pulau Kemboling bearing 155° and the W point of Pulau Kawio bearing 004°. Anchorage has also been found in 27m, coral and coral sand, with the SW point of Pulau Kemboling bearing 164° and the W point of Pulau Kawio 357°. On the E side of the islands there is an anchorage in 55m with the N point of Pulau Kemboling bearing 281° and the S point of Pulau Kawio 296°.

Marie Reef (Ehise), 10 miles E of Pulau Kemboling, is a large coral reef with a sandy patch always above-water. The height and extent of this patch change with prevailing winds and currents. Some rocks are on the NW side of the reef.

**Pulau Memanuk** (Pulau Memanoek) (4°36'N., 125°38'E.), 62m high and covered with palm trees, is 12 miles ESE of Pulau Kemboling. The depths are very irregular in the vicinity of the island. A shoal with a least depth of 11m is about 1.25 miles E of the island. A 9m shoal and a shoal with a least depth of 4m are 1 mile and 2 miles, respectively, S of the island.

**1.10 Pulau Matutuang** (Pulau Matoetoeng) (4°27'N., 125°42'E.), about 10 miles SSE of Pulau Memanuk, is 67m high, flat-topped, and covered with coconut palms. There is a fringing reef and two rocks are off the NW end of the island, outside of the reef.

**Tides—Currents.**—Strong tidal currents are in the vicinity of Pulau Matutuang.

Anchorage may be found in 46m off the E side of the island, staying clear of the coastal reef at the SE point, where shoal water extends for a considerable distance off.

**Pulau Dumarehe** (4°14'N., 125°42'E.) 12 miles S of Pulau Matutuang, is a 45m high rocky islet covered with vegetation.

Anchorage may be found in a depth of 69m S of the islet, but currents may be strong. Shoals of 10 to 20m are 6 to 10 miles SSE of the islet. A rock standing high out of the water is SE of the islet. The reef on the S side of the islet appeared to extend about 0.25 mile off. A small tree-covered islet lies close W of Pulau Dumarehe.

**Pulau Kawalusu** (Pulau Kawaloese) (4°14'N., 125°20'E.), 22.5 miles W of Pulau Dumarehe, is 285m high. A light is exhibited from the island.

**Louise Reef** (Napo Taroare) (4°03'N., 125°21'E.) is about 11 miles S of Pulau Kawalusu and has a least depth of 11m. A considerable current which gives rise to a violent sea sets across the reef and it should be avoided.

## Kepulauan Sangihe

**1.11 Kepulauan Sangihe** (Kepulauan Sangir), a group of islands lying between 2°N and 4°N, and between 125°E and 126°E, include Pulau Sangihe, the largest island and all the islands S of it to and including Pulau Biaro, about 76 miles S. They are heavily wooded and mountainous, except on places along the coast where they are low and flat; some marshes are on Pulau Sangihe. Tuhana, on Pulau Sangihe is the principal town. Copra is the main export. There are no roads; communication between villages is by boat.

### Islands and Dangers North and Northeast of Sangihe

**1.12 Pulau Lipang** (3°55'N., 125°23'E.), about 10 miles N of Pulau Sangihe, is 180m high and easily recognized from all sides by its pointed summit which is covered with coconut palms. Except for the N point, the island is reef-fringed for distances of about 0.3 mile offshore. A 12m shoal is 0.38 mile ENE of the steep N point of the island.

Anchorage may be found N of the island, or off a village near a beach on the W side, where the bottom is steep and the water deep. The currents here are irregular. A better place is N of the island, but anchorage there is further offshore.

**Pulau Buang** (Pulau Boeang) (3°53'N., 125°43'E.), 20 miles E of Pulau Lipang and covered with coconut palms, is the N most of a chain of islands extending 7 miles S; it is 54m high. A light is exhibited from Boeang. Salehe, an islet, is close N of Pulau Buang. Bowone Reef, with a least depth of 4m, is about 1.5 miles W of Selehe.

Pulau Melihang and Pulau Mekohahe, about 3.25 and 4 miles, respectively, SSE of Pulau Buang, are barren rocks. A 6.9m shoal is about 1.75 miles NW of Pulau Melihang, and a bare rock is about 1 mile N. An extensive reef is close S of Pulau Mekohahe. Pulau Balontohe, 50m high and Inis, 28m high, are steep rocks about 2.25 miles SSE and 3.5 miles S, respectively, of Pulau Mekohahe. This chain of islands is uninhabited. Between and near the chain are several reefs and shoals; therefore, navigation through the group is not advised.

**Pulau-pulau Toade** (Kepulauan Toade) (3°46'N., 125°34'E.), consisting of 2 large inhabited islands and 2 small islets, lie about 8 miles off the NE side of Pulau Sangihe (See paragraph 1.12.). The islands are all covered with coconut palms.

Pulau Manipa, the SW island, is 300m high. A coastal reef, which dries, extends about 183m offshore. Anchorage may be obtained off the S side of the island in a depth of about 80m, with the SE extremity of the island bearing 061°, at a distance of 0.3 mile.

Pulau Boekide, located NE of Pulau Manipa, is 241m high. Anchorage may be obtained 0.3 mile SE of the reef which extends from the SE extremity of the island, but the currents are rather strong there. A 4.6m shoal lies about 1.75 miles ESE of the SE extremity of the island.

**Tides—Currents.**—During November and December the general current between and E of the islands of Pulau-pulau Toade have been observed to flow at a velocity of 1 to 2.5 knots and to vary in direction by several points.

## Pulau Sangihe

**1.13 Pulau Sangihe** (Pulau Sangir) (3°33'N., 125°33'E.), the largest island of Kepulauan Sangihe, is covered with coconut palms and is mountainous. Gunung Awu (Gunung Awoe), near its N end, is an active volcano 1,359m high; earthquakes occur frequently. The coast varies greatly; it is steep and rocky in places and low and marshy in others. Fishing with the use of torches at night is carried out in the area, and as a result numerous lights may be seen at night during calm weather.

**Tides—Currents.**—A 2 knot current has been experienced along the W coast outside of the bays. Tide rips have been observed off the NW end of Pulau Sangihe.

**Caution.**—A large area of fish havens lies approximately 20 miles W of Pulau Sangihe and Pulau Siau, which extends up to 35 miles W and in a N-S direction for 70 miles.

**1.14 North and E coasts of Pulau Sangihe.**—The N coast of the island between Tanjung Salimar and Tanjung Peliang, 8 miles SW, slopes gradually toward the interior, except at the stretch near the villages of Kalasuga and Sawang, where it is steep and rocky. The depths along this coast permit anchoring almost anywhere, but there is no shelter.

Anchorage can be obtained in 49 to 70m, 0.15 mile offshore abreast of Sawang, which is not visible from seaward.

Tabukan (Taboekan), close SE of Tanjung Peliang, affords anchorage in 26 to 35m, with the flagpole at the village bearing 236°. The depths outside the 50m curve increase rapidly, but within that curve they decrease gradually toward the reefs and the shore. The roads are open from N through E to SE.

**Teluk Petaar** (3°39'N., 125°34'E.) is entered between Tanjung Buiase, its SE entrance point, and an unnamed point about 0.5 mile further NW. These entrance points are marked by beacons. A 222° range, consisting of beacons each in the form of a cross, leads into the bay. A light is shown from the village of Peta at the head of the bay. The bay affords room for one vessel only, up to 119m long. The bay is narrow between the shore reefs, but the depths shoal gradually.

**Anchorage.**—Vessels can anchor in 24m in the inner part of the bay, where they can run a mooring line to an iron ring near a warehouse on the shore. This must be done quickly as strong winds and currents can be expected and there is the danger of drifting onto the shore reef.

Large vessels may anchor in about 77m, coral, on the range and about 1 mile from the front range beacon mentioned above. The holding ground is not good, however, and the currents, which are semidiurnal, set SE across the entrance at the ebb at a velocity of 3 knots. The flood current sets NW and it is negligible.

**Peta** (3°39'N., 125°34'E.) (World Port Index No. 52450), at the head of Teluk Peta, has a postal substation. Cargo is loaded from surf-lighters, but the work may be impeded by swell.

Neither fresh water nor stores are available.

**Teluk Sensong** (3°38'N., 125°35'E.) lies 2.5 miles SSE of Teluk Peta. The shores are fringed by a reef which makes landing difficult.

**Tanjung Lehe** (3°37'N., 125°35'E.) lies about 1.5 miles SE of Teluk Sensong. Sarahoengoe, an above-water rock, stands on a reef about 1 mile S of the point.

**Teluk Talengan** (Teluk Mioeloe) (3°35'N., 125°34'E.) is entered about 2 miles S of Tanjung Lehe. Anchorage may be obtained in depths of 55 to 64m. The sea is usually calm here, although landing is difficult because of the shore reef, mud, and mangroves.

**Teluk Kuma** (Teluk Koema) (3°34'N., 125°36'E.) affords good anchorage in 13.7m, with the S entrance point bearing 134° and the center of the village bearing 223°. There is much surf on the beach during the N monsoon.

Teluk Kulur (Teluk Koeloe), 1 mile further to the SE, affords anchorage in depths of 20 to 34m in its outer part. The village of Kulur (Koeloe), at the head of the bay, is difficult to reach because of the broad coastal reef on which a heavy surf may arise.

**1.15 Teluk Manalu** (Menaloe Bay) (3°32'N., 125°38'E.) (World Port Index No. 52460), the bay formed by Lebessan, Pulau Batuwingkong, and Pulau Tehang, is nearly always calm and is entered between Tanjung Pako, the SE entrance point of Teluk Kulur, and Pulau Batuwingkong. Pulau Batuwingkong is connected to Tanjung Mahema, the N extremity of Lebessan, by a drying reef. The anchorage in the bay is approached on either side of Pulau Tehang. The channel between Pulau Tehang and Pulau Batuwingkong is about 0.5 mile wide

between the reefs on either side, with a least known depth of 8.5m in the middle. During the NW monsoon season a heavy swell is in this channel and its use is not recommended. A 7.8m shoal is about 1 mile ESE of Tanjung Pako and a detached rock, 0.7 mile further SE, dries. Batu Malitehang, a reef which dries, is near the middle of the bay.

**Tides—Currents.**—At Teluk Manalu there is both a diurnal and a semidiurnal tide, but the latter predominates. The spring highs of the two tides coincide. The highest water level occurs in May and November. The maximum rise and fall that can be expected are, respectively, about 1.3m above and 0.9m below mean sea level.

The coast S of **Lebessan** (3°30'N., 125°40'E.) is very high, rocky, and oddly shaped.

The strait between Pulau Sangahe and Pulau Beng-darat, S of Lebessan, is broad and deep, but a 12.8m shoal, marked by eddies, is in mid-channel. A coral reef with depths of 6m on its outer ends extends out about 0.75 mile S from the S extremity of Pulau Beng-darat. The 129m summit of Pulau Batuwingkong (Batoe Wingkong) and the coastal cliff at Lebessan in range 346° leads through the strait. A deep passage is between Pulau Beng-darat and Pulau Beng-laut; the shore reefs are easily recognized. Many bare rocks are N and E of Pulau Beng-laut (Beng Laoet).

A current with a velocity of 3 knots may be experienced in the strait between Pulau Sangahe and Pulau Beng-darat; it sets N with the flood and S with the ebb.

**Anchorage.**—A hill 149m high, and another 82m high are 0.7 mile SW and 0.9 mile WSW, respectively, of Batu Malitehang. Anchorage can be taken in 40 to 49m mud, with the 149m hill bearing 180° and the 82m hill bearing 260°.

**Dane** (3°26'N., 125°41'E.), a steep rocky islet with a very narrow coastal reef, is S of the above strait. A deep passage separates it from Pulau Sangahe.

**Anchorage.**—Off the village of Salurang (Saloerang), on the coast of S of Lebessan, there is anchorage in 55m with the SW point of Pulau Beng-darat bearing 124°, and white rocks N of Pulau Beng-laut bearing 069°, but this location is rather close to the reef. Landing is difficult during the NW monsoon because the coastal reef dries at that time.

**1.16 South and W coasts of Pulau Sangahe Pulau Lenggis** (3°23'N., 125°38'E.), an islet 110m high, is separated from Pulau Sangahe by a narrow passage, navigable only by native canoes at HW.

Teluk Ngalipaeng, W of Pulau Lenggis, is calm only during the N monsoon. Anchorage can be obtained in 86m. The village of Kampung Ngalipaeng is at the head of the bay, off which is a wide shore reef.

**Pulau Batunderang** (Pulau Batoenderang) (3°22'N., 125°37'E.), an island 187m high, is W of Teluk Ngalipaeng and is separated from the S extremity of Pulau Sangahe by a passage which dries.

**Pulau Bebalang** (3°20'N., 125°34'E.), an island about 2 miles W of Pulau Batunderang, is 131m high. A 5.9m shoal is about 1 mile SE of the island. A navigable channel is between the island and Pulau Sangahe. Anchorage can be taken in 80m about 0.25 mile off the village of Kampung Bebalang on the N shore of the island, with the flagstaff bearing 146°.

Two islets, Pulau Mendako (Mendakoe), 79m high, and Pulau Dakupang (Dakoepang), are on a reef N of Pulau Bebalang. A rock awash is 0.6 mile W of Pulau Dakupang, and an 11m shoal is about 1 mile SW of Pulau Mendaku.

The village of Kampung Lapango lies on the coast of Pulau Sangihe E of **Tanjung Boewoe** (3°23'N., 125°34'E.). Anchorage can be obtained in about 55m about 91m off the drying reef with the middle of the village of Kampung Lapango bearing 052°. Local knowledge is necessary.

**1.17 Teluk Dago** (3°26'N., 125°33'E.) (World Port Index No. 52420) is entered between Tanjung Toade Manandu (Manandoe) and Pulau Mahumu (Mahoemoe). Tandjung Toade Manandu is rocky and has a small island W of it. A light is exhibited from Toade Manandoe. Pulau Mahuma, with a summit 241m high, is a hilly island separated from Pulau Sangihe by a channel that is navigable only by small native canoes. Inside Teluk Dago it is always calm E of Sama, a small islet off the shore of the bay.

Anchorage sheltered from all but SW winds may be obtained in about 49m with Sama bearing 262°. At Dago, close NE of Sama, a small mole extends out across the drying shore reef. A flagstaff is at the foot of the mole. The reef at the head of the bay and along the N shore of the bay occasionally dries out for a distance of about 0.25 mile.

In the bight at the village of Kalinda, about 2 miles N of Teluk Dago, the depths are too great and the bottom too steep for anchorage.

**1.18 Teluk Tamako** (3°27'N., 125°30'E.) (World Port Index No. 52430) affords anchorage in front of the village of Tamako. Anchorage should be in 55m or more in about the middle of the bay with the two points on the coast NW, Tanjung Kapehetang and Tanjung Lelapide, in line. Holding ground is poor, however, and the main engines should be kept ready for use.

A light is exhibited from a beacon in Tamako 0.13 mile NNW of the pilot station.

**Teluk Manganitu** (3°34'N., 125°30'E.) is a bay bordered by coconut palm covered hills 198 to 244m high. A shore reef extends about 0.5 mile off the S part of the bay. A 2.3m shoal, often marked by discoloration is 0.75 mile SSE of Tanjung Kalehangeng. Safe anchorage is in the bay in 53m with Tanjung Totone bearing N and the small island Bukide (Boekide) bearing E, but W and S winds can be troublesome.

The coast between Teluk Manganitu and Teluk Tahuna is steep and rocky and is fringed by a drying reef in several places.

**1.19 Teluk Tahuna** (3°36'N., 125°29'E.), is about 0.5 mile wide and extends about 1.5 miles inland. Except for the shore reef on the S side and the shore bank at the NE corner, there are no dangers in the bay, so it can be entered even at night in clear weather. A 520m hill close S of the bay is conspicuous and a small white mosque with a red roof at the head of the bay is prominent.

A light shows at a height from 130m near the S entrance point of the bay.

**Tahuna** (3°37'40"N., 125°29'25"E.) (World Port Index No. 52440) is the principal village of Kepulauan Sangihe. A custom house is at the head of the pier. Copra is the chief export. A light is shown from an iron support at the foot of the pier when vessels are expected.

There is a pier, 29m long, with a depth of 3.1m alongside. Large vessels, up to 70m long, remain at anchor and unload into barges.

**Tides—Currents.**—There is both a diurnal and a semidiurnal tide in the bay, but the latter predominates. The spring highs of the two tides coincide. The highest water level occurs in May and November. The maximum rise and fall that can be expected are, respectively, about 1.1m above and 0.8m below mean sea level.

Anchorage can be taken off the village in about 35 to 55m with the pier light bearing 355°. The holding ground is poor, however, and the main engines should be kept ready for use. It is usually calm, but during the N monsoon W winds may spring up and last from 1 to 4 days; they are not dangerous to vessels but cause much surf on the beach. The W winds, which occur at other times of the year, as well as the often strong SW winds, are of shorter duration and lesser intensity, but they may hinder loading or unloading.

From Teluk Tahuna to about 1 miles S of Tanjung Dodah, the land slopes gradually down to the shore with sand and stone beaches, and then to Tanjung Salimar the coast is steep and rocky. No dangers have been seen along this part of the coast.

## Karakitang Islands

**1.20 Karakitang Islands** (3°10'N., 125°29'E.) is a collective name for the smaller islands and rocks lying between Pulau Sangihe and Pulau Siau. Only Pulau Kalama, Pulau Karakitang and Pulau Para are inhabited. When in this area the caution note at the beginning of this sector regarding volcanic activity should be borne in mind. The rocks which are off the W side of Pulau Mahengetang are the result of an eruption in 1919. According to the inhabitants, a column of water spouts high into the air periodically.

The passage between Pulau Sangihe and this group of islands, as well as the passage between Pulau Siau and the group, is clear of dangers. The chart is the best guide for the location of the various islands and the dangers near them.

**Pulau Kalama** (3°15'N., 125°27'E.), lying about 10 miles SW of Pulau Batunderang (See paragraph 1.16.), is 362m high. Anchorage may be obtained S of a village on the SW side of the island in a depth of about 60m 0.15 mile offshore. The coastal reef here extends about 91m offshore. A considerable current has been noticed near the anchorage.

**Pulau Karakitang** (3°10'N., 125°31'E.), 249m high, lies about 3.25 miles SE of Pulau Kalama. Teluk Behongang, a bay on the N side of Pulau Karakitang extends halfway into the island. It affords sheltered anchorage in 80m in front of the village of Behongang. The extremities of the shore reefs are easily distinguished. A stone mole with wooden superstructure has a depth of 2m alongside and is a good landing place for boats.

Pulau Mehengetang, 139m high, lies about 6 miles S of Pulau Kalama. There is an islet close W, and three low rocks within 0.25 mile WNW of the island. A village, with a flagstaff, is on the SW side of the island. Anchorage may be obtained off the village in a depth of 37m, with a vegetation covered islet on the reef bearing 339°, distant 0.3 mile.

**Caution.**—The whole area W and S of the island is reported to be disturbed by eddies and tide rips.

**Pulau Para** (3°05'N., 125°30'E.), along with Pulau Siha, Pulau Salangkere, and Pualu Nitoe, lie in a group close together about 9 miles SSE of Pulau Kalama. Anchorage may be obtained, in 60m, 0.2 mile off the village on the SW point of Pulau Para, with vegetation-covered rocks on the W coast N of the inlet in range with the highest point of Pulau Salangkere and the rocky point S of the village bearing about ESE. Local knowledge is necessary. A strong current between Pulau Para and Pulau Nitu is W of this anchorage.

The channel between the islands of Pulau Para, Pulau Salangkere, and Pulau Siha should be navigated only by small native canoes, but the area between these three islands and Pulau Nitu is apparently deep and clear.

**Pulau-pulau Nenoeng** (Pulau-pulau Nenong) (3°04'N., 125°40'E.), about 18 miles SE of Pulau Kalama, consists of a 49m high islet, with some above-water rocks lying about 0.25 mile N and S of it. A submerged rock lies about 1 mile SSE of the islet. A coral bank, with a depth of 14.6m, often marked by breakers and tide rips, lies 4 miles SW of the islet.

**Pulau-pulau Sanggeluhang** (Pulau-pulau Sanggeloehang) (2°57'N., 125°29'E.), 80m high, with an islet 77m high on the same reef close S, is 7 miles SSW of Pulau Para. Pulau Bawondeke (Bowondeke), 56m high, is 1.5 miles W of Pulau Sanggeluhang. A shoal with a least depth of 5m is about 0.5 mile NW of Pulau Sanggeluhang.

**Tides—Currents.**—An E set at the rate of 1.5 to 2.25 knots has been experienced between Pulau Sanggeluhang and Pulau Tahulandang (2°21'N., 125°22'E.), about 38 miles S.

## Pulau Siau and Off-lying Islands

**1.21 Pulau Siau** (2°43'N., 125°22'E.), locally known as Karang Etang, meaning "highest island", is in general high with steep coasts and no beaches or landing places except in the bight on the E coast. The island is covered with coconut palms, out of which rise several jungle-covered conical peaks. An exception to this is the bare peak of the volcano Gunung Api, last reported active in May 1971. This volcano is 1,827m high and is the highest point on the island.

The island is densely populated. Many of the inhabitants are fishermen who also farm. There are coconut and nutmeg plantations.

**Ulu** (2°44'N., 125°25'E.) (World Port Index No. 52410) is at the N part of Ulu Road. There is a pier at the village from which a light is exhibited on the arrival of vessels.

Anchorage can be obtained 0.15 mile offshore in 80m with the charted conspicuous white pillar on the shore bearing N. The bottom is very steep here, however, and it is advisable to lay out a hawser to the shore. During heavy squalls anchorage may also be found in 48m with the same white pillar bearing 010° and the flagstaff bearing 296°; a hawser to the shore

should not be necessary. From the beginning of January until the middle of April this anchorage is not safe because of NE and E winds. During that time and during the S monsoon anchorage off the village of Sawang, 3.5 miles S, is preferred; here the bottom is not so steep.

Elsewhere on Pulau Siau anchorage is off Ondong, at about the middle of the W coast, in 101m very close but somewhat to the S of the shore reef. Anchorage will also be found in a depth of 84m, 0.11 mile offshore with the center of the village bearing 034°.

Pulau Pahepa, Pulau Gunatin, and Pulau Mahoro are E of the S part of Pulau Siau. The channel between Pulau Siau and hilly Pulau Pahepa is clear and has a least depth of 37m, and the shore reefs are well-marked by discoloration. There is anchorage here with good holding ground, but the currents may attain a velocity of 2.5 knots and eddies may be encountered. Off the village on the W side of Pulau Pahepa there is anchorage with shelter during the entire year. A drying reef connects Pulau Pahepa with rocky Pulau Gunatin, the N side of which should be given a wide berth. Pulau Mahoro, steep, rocky, and marked by a light 80m high is E of Pulau Pahepa. There are three small islets between the two. Anchorage is not recommended near the islets because of reefs and strong currents, but between the islets and Pulau Pahepa there is a limited area where anchorage is possible. Laweang is 61m high and the S most of the islets. A coral reef with a depth of 0.3m extends 0.5 mile S; with a heavy swell the reef may uncover at LW.

**Pulau Makalehi** (2°44'N., 125°10'E.), an isolated islet 228m high, is about 11 miles W of Pulau Siau. The islet is covered with vegetation. The village of Makalehi is on a small bay on the SW side of the islet. The bay is obstructed by reefs and dries. The islet was reported to be a good radar target at a distance of 23 miles.

## Islands South of Pulau Siau

**1.22 Pulau Tahulandang** (2°21'N., 125°22'E.), about 15 miles S of Pulau Siau, is mountainous and rises to an elevation of 805m. Its summit is the highest point of a crater which is broken on the NNW side forming Minangan Bay. In the middle of this crater there is an extinct volcano which is steep on all sides. The S and E coasts are very steep-to. The large coastal reef, which is not well marked by discoloration, extends 0.76 mile from the W end of the island. The channel between this reef and the reef at Pulau Pasige is deep and clear. The W point of Pulau Ruang bearing 180° will lead through this channel when it is difficult to identify the reefs. There are coconut plantations on the island. It is well populated and large trading vessels are built here.

A light is shown from a white column near the flagpole at the village of Tahulandang (Boehias) on the SW side of the island. Vessels call at the villages.

**Anchorage.**—The coast reef is very narrow near the light at Tuhulandang, and vessels may anchor close off it in 80m. Further to the NW there is anchorage in 69m further from the reef. The currents which set through the narrows between Pulau Tahulandang and Pulau Ruang are less troublesome at

the latter anchorage. When the sea is rough, anchorage may be taken on the N side of Pulau Ruang in 49 to 80m, laying out a hawser to the shore.

Off the village of Haas, on the S side of the island, there is anchorage in 48m 0.19 mile offshore. From this anchorage the NE point of Pulau Biaro bears 181°, the road in the village bears 013° and the point to the E bears 083°. Local knowledge is necessary. It is an open roadstead, and a fairly strong current is sometimes experienced.

On the N side of the island there is anchorage in Minangan Bay, near the village of Minangan. Local knowledge is necessary. It is very deep here, but the shore reef is very narrow or non-existent so that the shore can be approached closely. It is well-sheltered during the S monsoon and in the transition periods between monsoons.

**Pulau Ruang** (Pulau Roeng) (2°18'N., 125°22'E.), close SW of Pulau Tahulandang, consists entirely of an active volcano 731m high. The summit is on the E side of the crater and is easily recognized by several sharp rocky points. At a distance, the volcano has the appearance of a table mountain with steep sides. The last eruption occurred in 1904. A coral reef extending from the W end of the island is the only coastal reef. There are few inhabitants.

The passage between Pulau Ruang and Pulau Tahulandang is 0.5 mile wide, but its use is not recommended because of strong tidal currents which set SE with the flood and NW with the ebb. A 1.8m midchannel shoal is at the E entrance.

**Pulau Pasige** (2°21'N., 125°19'E.), 4.5 miles W of Pulau Tahulandang, is low, covered with mangrove, and uninhabited. It is on the W end of an extensive drying reef which is generally marked by breakers, even at HW. A light is shown from the W side of the island.

**1.23 Pulau Biaro** (2°06'N., 125°23'E.), an inhabited island 10 miles S of Pulau Ruang, is the S most island of Kepulauan Sangihe. It is hilly and has a very conspicuous peak, Bukide

(Boekide), 401m high on its E side. Toendoengkoehan is a small islet, 54m high, off the SW point of the island. The low NW point, where a 9m rock stands, should be given a berth of 1.5 miles. The outermost shoal, with a depth of 5.8m, is about 1 mile NW of the point; the currents are strong over the shoals in this vicinity. Another pillar-like rock stands near Tanjung Meoh, the NE point of the island. From this point a submerged ridge extends 1.5 miles N with a depth of 35m at its outer end. Currents are strong over this ridge. A berth of at least 0.5 mile should be given the E coast to clear several offshore dangers close to the shore.

Anchorage can only be found on the N and NE sides of the island. The bay on the N side should be approached with caution because the depths decrease suddenly and the shore reef cannot be distinguished at HW when the sea is calm. Except for 4.6m reef about 0.2 mile from the shore reef, there are no detached dangers in the bay, and anchorage is almost anywhere 0.2 mile from the reefs.

In the bight on the NW side there is anchorage in 70m off the village of Lamanggo, with Bukide bearing 139°; however cross currents should be expected.

The passage between Pulau Biaro on the N and Pulau Bangka and Pulau Talisei on the S is 18 miles wide and apparently deep and clear. A depth of 88m is about 8 miles SSW of Tanjung Buang the S point of Pulau Biaro and a depth of 46m was reported 5 miles SSW of Tanjung Buang. A depth of 62m was reported 6 miles WSW of Tanjung Buang and depths of 64m were reported 4 and 3.8 miles W and WSW, respectively, of Toendoengkoehan.

Both Pulau Bangka and Pulau Talisei are heavily-wooded and hilly, rising to heights of 348m and 359m, respectively. A light is exhibited from Tanjung Arus (Tanjung Aroes), the N extremity of Pulau Talisei. Pulau Bangka and Pulau Talisei, lying off the N end of Sulawesi (Celebes) and forming the S side of Selat Bangka, are further described in Pub. 163, Sailing Directions (Enroute) for Borneo, Jawa, Sulawesi, and Nusa Tenggara.