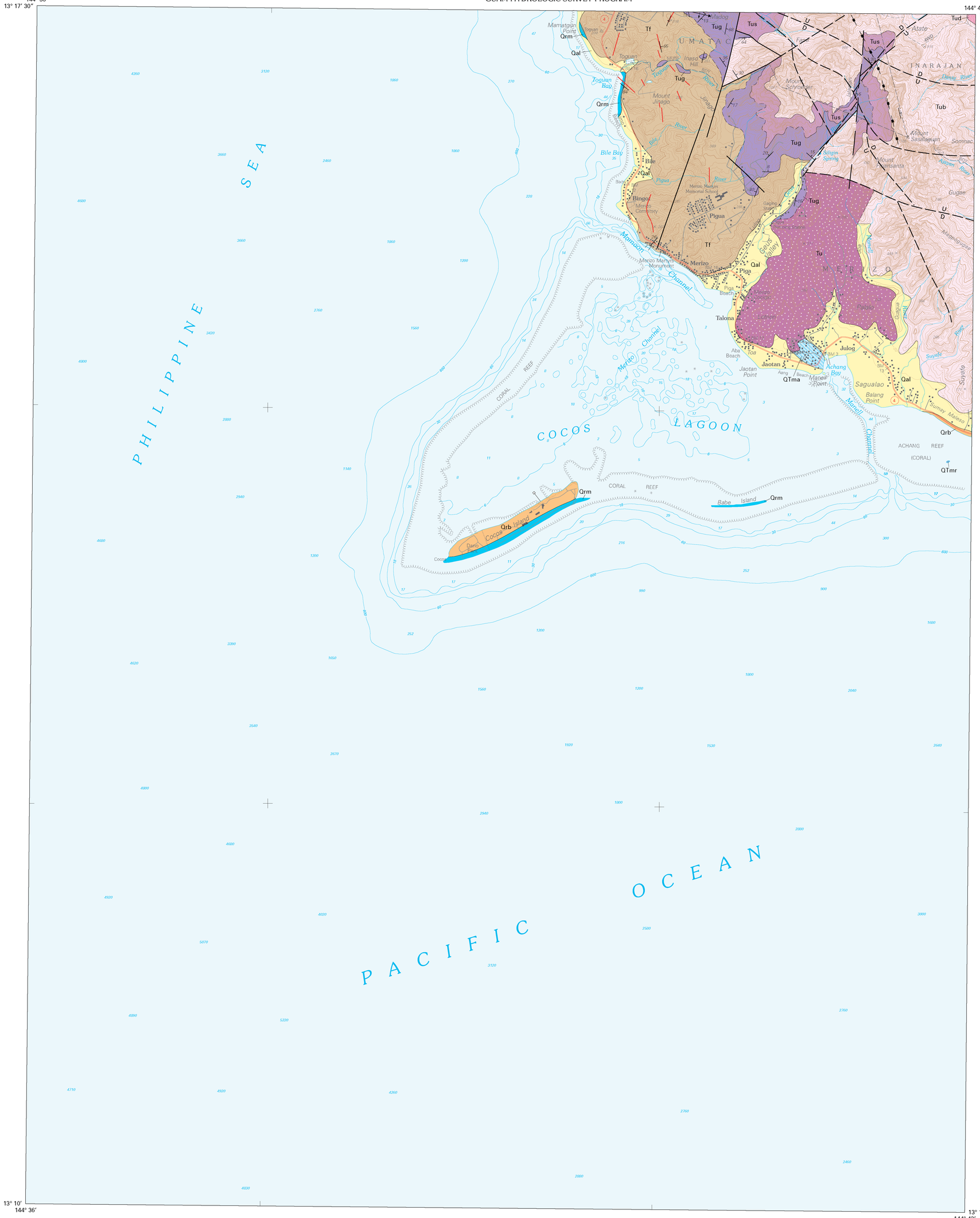
Revisions partially funded by
WATER & ENVIRONMENTAL RESEARCH INSTITUTE AT THE UNIVERSITY OF GUAM
through the
GUAM HYDROLOGIC SURVEY PROGRAM

144° 36′ 13° 17′ 30″ — 144° 42′ 13° 17′ 30″ — 13° 10′ 144° 36′ — 13° 10′ 144° 42′



DESCRIPTION OF MAP UNITS

Reefs—reef platforms of living coral, coralline algae, and reef sediment, raised terraced ramps and pools, and algal encrusted intertidal bedrock outcrops, including basaltic outcrops along the southwest coast and limestone outcrops on the platform margin from Rittidian Point south to Urano Point

Qrb — **Beach deposits (Quaternary)**—beach sand and gravel, beach rock in the intertidal zone, and small isolated patches of recently emerged detrital limestone. Sand generally is less than 15 feet above sea level, seldom as much as 30 feet above

Qrm — **Merizo limestone (Quaternary)**—emergent Holocene (2,500-4,800 years old) coralgal reef limestones, 2-12 feet thick, capping modern reef flats and platforms. Occurs as intertidal and low-supratidal outcrops. Extensive supratidal outcrops at Tarague (algal-rich), Ylig Point (coral-rich), and Aga Point (detrital-rich). Almost no meteoric diagenetic alteration evidenced in outcrops. Many outcrops, too small to map, occur along SW coast between Merizo and Agat

Qal — **Alluvium (Quaternary)**—alluvial clay deposits, mostly 30-100 feet thick, muck and clay in marshy estuarine deposits on the west coast, scattered sand and gravel bars within deposits near SE river mouths, and clay fill in large sinks in limestone areas

—UNCONFORMITY—

Mariana limestone (Pliocene and Pleistocene)
The maximum aggregate thickness of the Mariana limestone formation is estimated to be between 550 and 600 feet (Rittidian Point Quadrangle)

QTmr — **Reef facies (Pliocene and Pleistocene)**—massive, generally compact, porous, and cavernous white limestone of reef origin, especially along cliff faces, made up mostly of corals in position of growth in matrix of encrusting calcareous algae

QTma — **Hagåtña argillaceous member (Pliocene and Pleistocene)**—coarse-to fine-grained pale-yellow, tan, or brown fossiliferous detrital limestone containing 2 to 5 percent disseminated clay and as much as 20 percent clay in pockets and cavities; includes undifferentiated lenses of other Mariana Limestone facies. Formation typically unconformable upon underlying rocks.

—UNCONFORMITY—

Umatac formation (Oligocene-Miocene)
Aggregate thickness of formation about 2200 feet

Tu — **Umatac formation undifferentiated (Miocene)**—unresolved stratigraphic sequences in Umatac formation that encompass sections of Tub, Tug, and/or Tus. Approximate thickness ranges from 200 to 500 feet

Tud — **Dandan flow member (Miocene)**—compact medium- to coarse-grained porphyritic andesite flows separated from the underlying Bolanos pyroclastic member by a flow breccias approximately 10 feet thick; maximum thickness of member 50 feet.

Tub — **Bolanos pyroclastic member (Miocene)**—breccias, conglomerates, and sandstones consisting largely of fragmented andesite. These andesites typically have prominant euhedral augite phenocrysts up to 1 centimeter in length and millimeter-scale plagioclase phenocrysts. Limestone clasts are conspicuous in some breccias and conglomerates. Estimated thickness of the Bolanos pyroclastic member ranges from 750 to 1000 feet

Tus — **Schroeder flow member (Miocene)**—basaltic andesite pillow lava with plagioclase, augite and olivine phenocrysts. Volcanic sandstones consisting of clasts derived from the pillow lavas. Interbedded with the uppermost portion of the Schroeder flow member. Estimated thickness of the Schroeder flow member ranges from 100 to 400 feet

Tug — **Geus River member (Oligocene)**—interbedded limestones, sandy and tuffaceous limestones, sandstones and conglomerates. Clasts in sandy units are largely fragmented and altered andesitic volcanics, but also include intraformational limestones including reef limestones not seen in southwestern Guam. Conglomerates with clasts of basalts, andesites and dacites are considered to be near the base of Tug. Estimated thickness of the Geus River member ranges from 250 to 300 feet

Tf — **Facpi formation (Eocene)**—basal portion consists of high-Ca boninite pillow lavas interbedded with pillow breccias, hyaloclastites, and sandstones of the same lithology. Least differentiated lavas have olivine, augite, and chromite phenocrysts; more differentiated varieties lack chromite and have plagioclase and orthopyroxene phenocrysts. The upper portion consists of pillow lavas, breccias, bedded breccias and conglomerates of arc tholeiitic basalt with olivine, augite, and plagioclase phenocrysts. Boninitic and basaltic dikes cut this formation and are particularly abundant in the region of the Facpi peninsula. All portions of this formation have undergone zeolite facies metamorphism, and many areas also have undergone lateritic weathering. Estimated thickness of the Facpi formation ranges from 500 to 800 feet

EXPLANATION OF MAP SYMBOLS

Contact—Dashed where approximately located, gradational, or inferred

Fault (showing dip)—Solid where definitely located; dashed where approximately located; dotted where concealed. Queries indicate uncertainty as to existence of fault. Arrows show relative movement. U, upthrown side; D, downthrown side

Thrust fault—Dashed where inferred

Basaltic and boninitic dike

Anticline—Showing crestline and bearing and plunge of axis

Strike and dip of beds

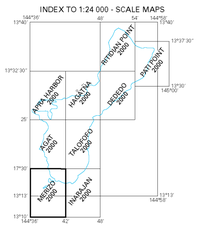
32 — inclined

15 — vertical

Strike of vertical joints—A line of joint symbols indicates a prominent joint or structural lineament, along which unbrecciated limestone is cut by a dominant set of joints in which solution has produced deep fissures bounding elongate, pinnacled ridges or along which volcanic rocks are cut by recognizable structural lines that show as a series of knobs and ridges crossing topographic trends or as fine fissures. In places, drainage patterns and valley-wall alinements are determined by these lines. Minor movement at the zone may have occured, but significant stratigraphic displacement is not shown

Base from U.S. Geological Survey, 1:24,000 GIS quadrangle

INDEX TO 1:24 000 - SCALE MAPS



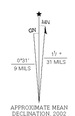
SCALE 1:24 000

1 — 1/2 — 0 — 1 MILE

1000 — 0 — 1000 — 2000 — 3000 — 4000 — 5000 — 6000 — 7000 FEET

1 — .5 — 0 — 1 KILOMETER

CONTOUR INTERVAL 20 FEET



APPROXIMATE MEAN DECLINATION, 2002

GEOLOGIC MAP OF MERIZO QUADRANGLE, GUAM

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