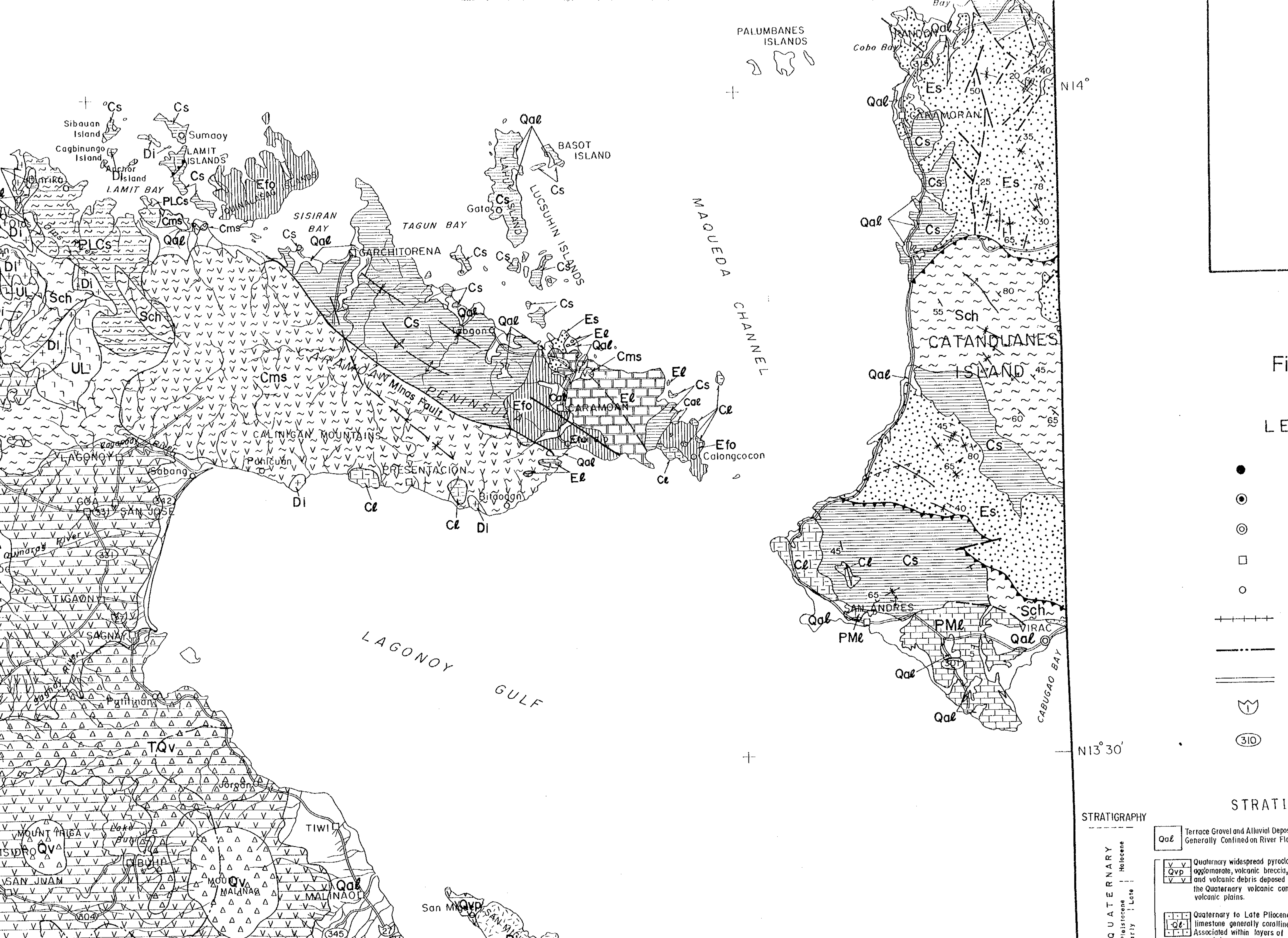

PALUMBANES ISLANDS
Cobo Bay
PANDAN
CARAMORAN
N14°
CATANDUANES ISLAND
Sibauan Island
Sumaoy
Cagbinungo Island
Anchor Island
LAMIT ISLANDS
LAMIT BAY
QUINALIGAO ISLANDS
BASOT ISLAND
LAHUY ISLAND
LUCSUHIN ISLANDS
Gata
SISIRAN BAY
TAGUN BAY
GARCHITORENA
MAQUEDA CHANNEL
Tabgon
CARAMOAN PENINSULA
Minas Fault
CARAMOAN
Calongcocon
CALINIGAN MOUNTAINS
Pahicuan
PRESENTACION
Bitaogan
LAGONOY
Sabang
GOA
SAN JOSE
Quinaragan River
TIGAON
SAGNAY
Sagnay River
Patitinan
LAGONOY GULF
SAN ANDRES
VIRAC
CABUGAO BAY
N13°30'
Jorgan
TIWI
MOUNT IRIGA
Lake Buhi
BUHI
MOUNT MALINAO
MALINAO
San Miguel
SAN JUAN
Qal
Cs
Cms
PLCs
Di
UL
Sch
Efo
Es
El
Cl
Cal
PMl
TQv
Qv
Qvp
STRATIGRAPHY
QUATERNARY
Holocene
Pleistocene
Late
Early
Terrace Gravel and Alluvial Deposits Generally Confined on River Flo
Quaternary widespread pyrocla agglomerate, volcanic breccia, and volcanic debris deposed the Quaternary volcanic con volcanic plains.
Quaternary to Late Pliocene limestone generally coralline Associated within layers of
STRATI
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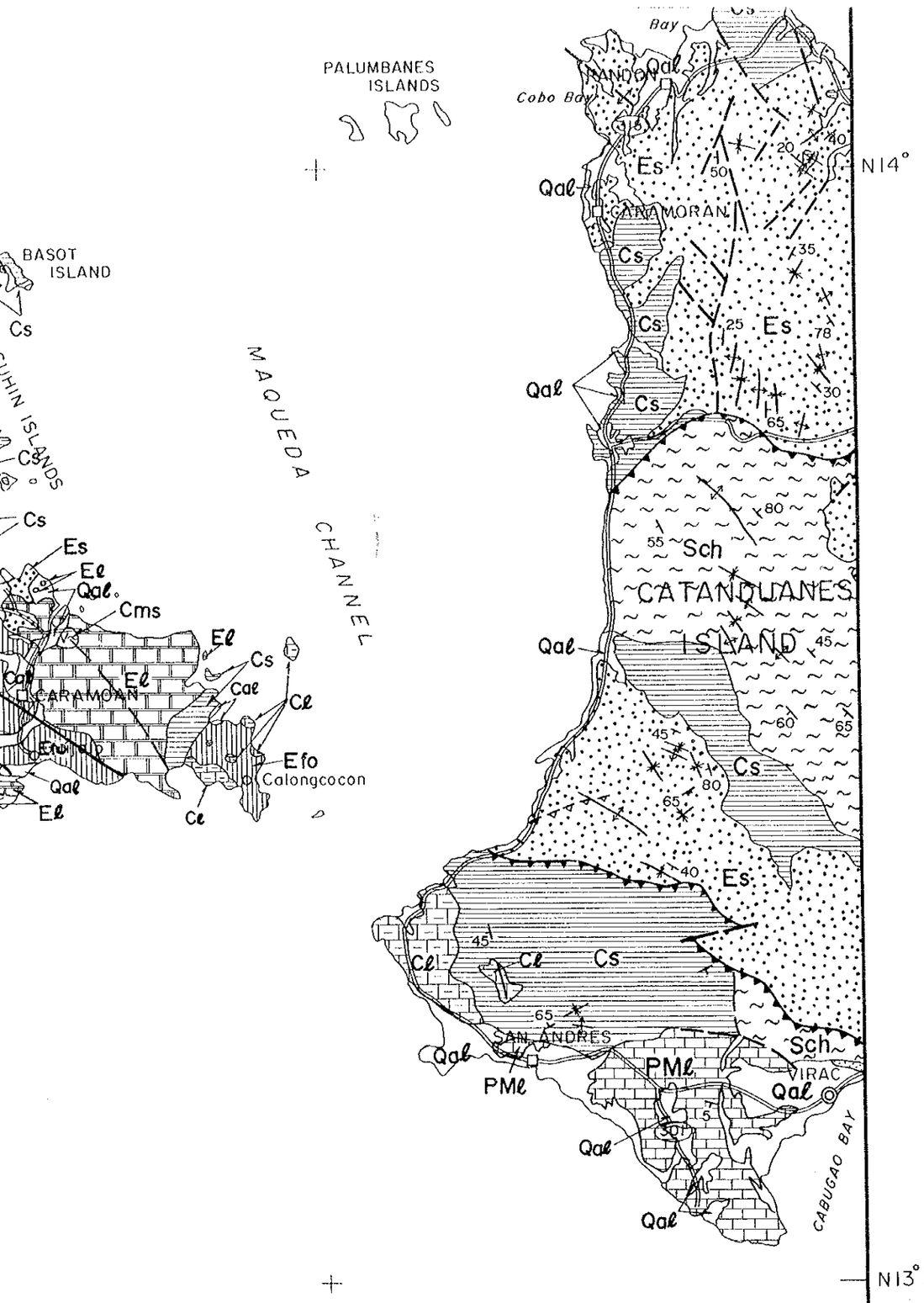
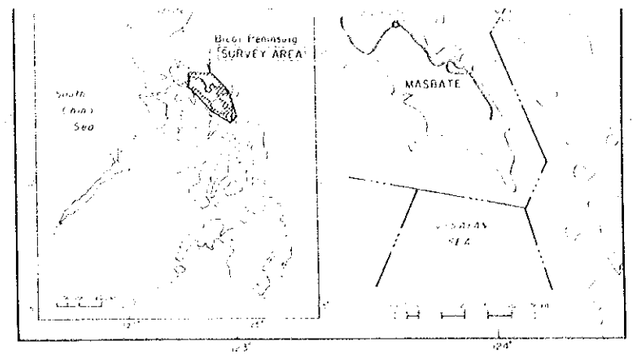
Fi





Scale 1 : 250,000

0 5 10 15 20 km

Fig.I-3-1 Geological Map of the Bicol Area

LEGEND

- Chartered city
- City capital of province
- Capital of province
- Municipality or municipal district
- Barangay
- Railroad
- Provincial boundary
- First and second class road
- Route markers : National
- Route markers : Provincial

EXPLAWTION

STRATIFIED ROCK

INTRUSIVE AND PSEUDO-STRATIFIED ROCKS

STRATIGRAPHY

QUATERNARY — Holocene — Late

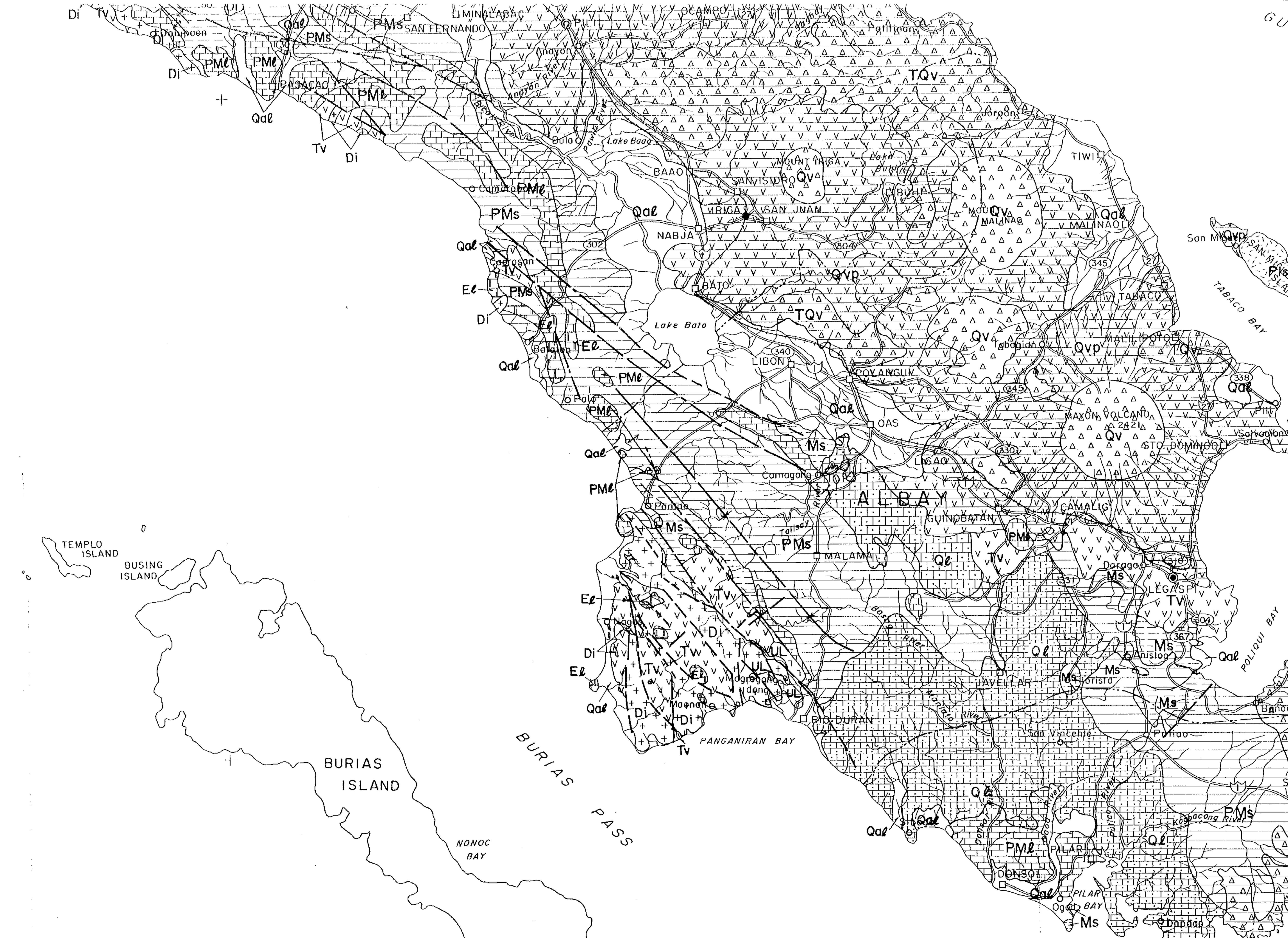
Qal Terrace Grovel and Alluvial Deposits Generally Confined on River Floodplains.

Qvp Quaternary widespread pyroclastic agglomerate, volcanic breccia, tuff, pumice and volcanic debris deposed around the Quaternary volcanic cones and volcanic plains.

Quaternary to Late Pliocene limestone generally coralline.

Qv Quaternary andesitic and dacitic volcanic deposit, occurring mainly as lava flows in volcanic centers.

N13°30′
N13°
MULANAY
SAN NARCISO
BONDOC PENINSULA
ALIBIJABAN ISLAND
SAN ANDRES
TEMPLO ISLAND
BUSING ISLAND
Qal
Di
Tv
PMs
PMl


ALBAY
BURIAS ISLAND
BURIAS PASS
TEMPLO ISLAND
BUSING ISLAND
NONOC BAY
PANGANIRAN BAY
TABACO BAY
POLIQUI BAY
PILAR BAY
Lake Bato
Lake Baao
Lake Buhi
MOUNT IRIGA
MALINAO
MAYON VOLCANO
2421
TIWI
TABACO
MALILIPOT
SAN FERNANDO
MINALABAC
PILI
OCAMPO
BAAO
NABJA
IRIGA
SAN JUAN
BATO
BUHI
LIBON
POLANGUI
OAS
LIGAO
GUINOBATAN
CAMALIG
MALAMA
LEGASPI
Daraga
JAVELLAR
Florista
Anislag
San Vincente
RIO DURAN
DONSOL
PILAR
Pulido
Camarogo
Cagrason
Balatan
Palo
Pantao
Nagas
Magragong
Maonan
Sibogal
Ogod
Dapdap
Camragong
Bula
Anayon
Jorgon
Sto. DOMINGO
Pasacao
Dalupaon
San Miguel
Bicol River
Pawili River
Anayon River
Talisay River
Bariba River
Manlota River
Donsol River
Ogod River
Putiao River
Kabacong River
Qal
Qvp
Qv
Ql
TQv
PMs
PMl
Ms
Tv
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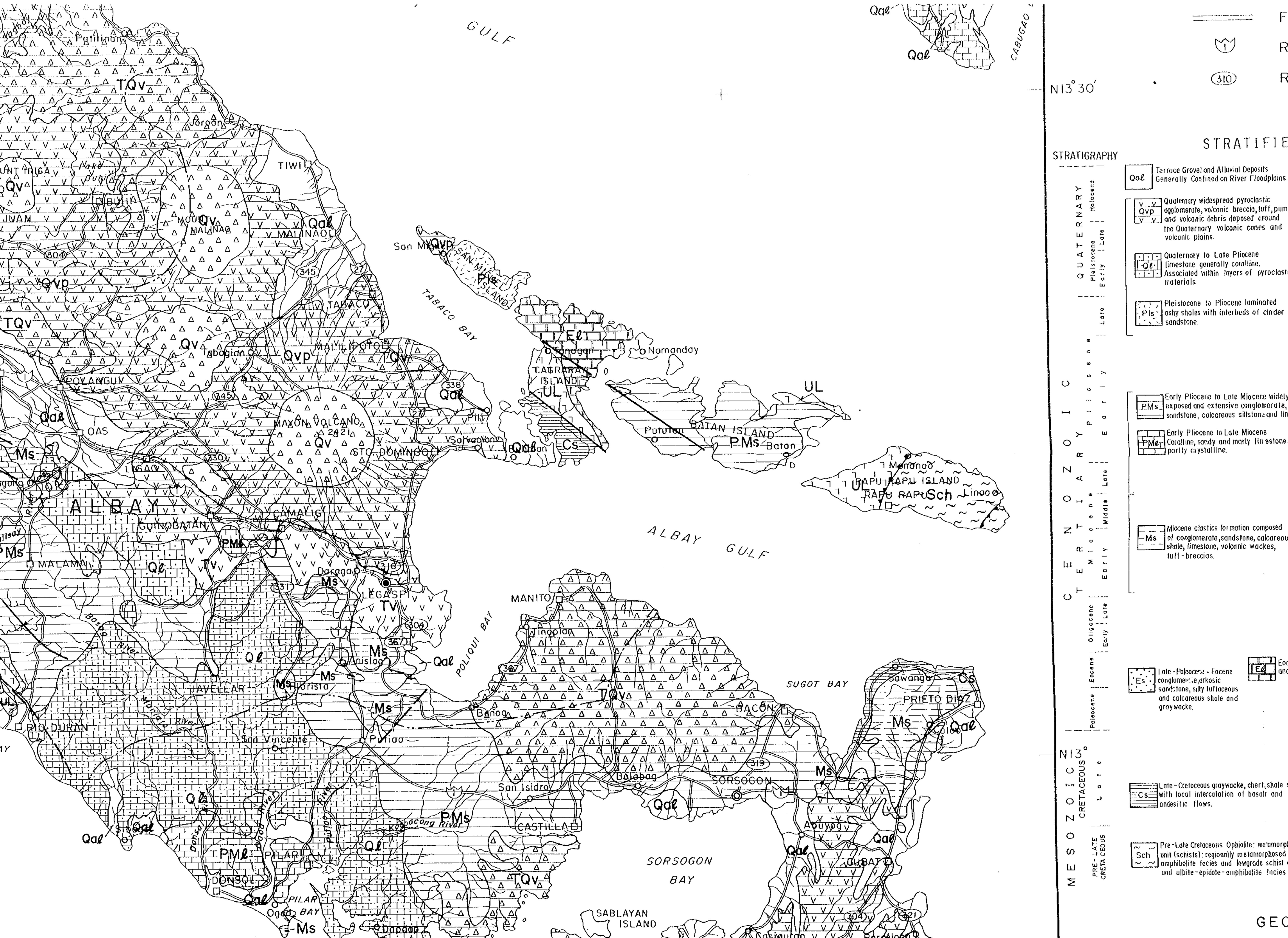
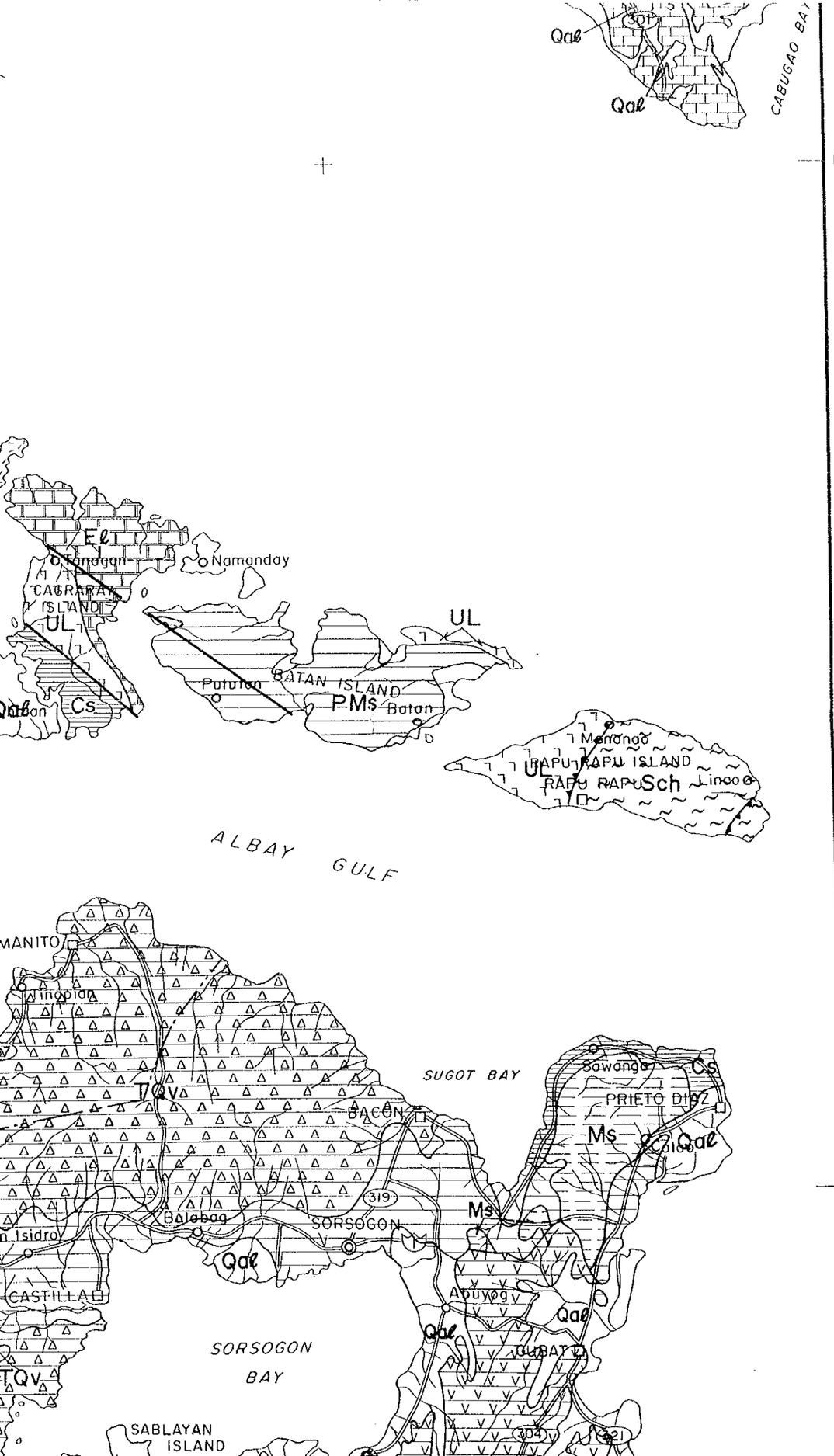
El
UL
302
304
340
345
338
330
331
367
318
27
1



GULF
CABUGAO
N13°30'
STRATIFIE
STRATIGRAPHY
Terrace Gravel and Alluvial Deposits Generally Confined on River Floodplains
Quaternary widespread pyroclastic agglomerate, volcanic breccia, tuff, pum and volcanic debris deposed around the Quaternary volcanic cones and volcanic plains.
Quaternary to Late Pliocene limestone generally coralline. Associated within layers of pyroclast materials.
Pleistocene to Pliocene laminated ashy shales with interbeds of cinder sandstone.
Early Pliocene to Late Miocene widely exposed and extensive conglomerate, sandstone, calcareous siltstone and lim
Early Pliocene to Late Miocene Coralline, sandy and marly limestone partly crystalline.
Miocene clastics formation composed of conglomerate, sandstone, calcareous shale, limestone, volcanic wackes, tuff-breccias.
Late-Paleocene-Eocene conglomerate, arkosic sandstone, silty tuffaceous and calcareous shale and graywacke.
Late-Cretaceous graywacke, chert, shale with local intercalation of basalt and andesitic flows.
Pre-Late Cretaceous Ophiolite: metamorph unit (schists): regionally metamorphosed amphibolite facies and lowgrade schist and albite-epidote-amphibolite facies
CENOZOIC
QUATERNARY
TERTIARY
MESOZOIC
CRETACEOUS
PRE-LATE CRETACEOUS
Holocene
Pleistocene
Pliocene
Miocene
Oligocene
Eocene
Paleocene
N13°
TABACO BAY
ALBAY GULF
POLIQUI BAY
SUGOT BAY
SORSOGON BAY
PILAR BAY
ALBAY
TIWI
MALINAO
TABACO
MALILIPOT
POLANGUI
OAS
LIGAO
GUINOBATAN
CAMALIG
DARAGA
LEGASPI
STO. DOMINGO
MAYON VOLCANO 2421
MALAMA
JOVELLAR
PIO DURAN
MANITO
BACON
SORSOGON
CASTILLA
DONSOL
PILAR
SAN MIGUEL ISLAND
CAGRARAY ISLAND
BATAN ISLAND
RAPU RAPU ISLAND
SABLAYAN ISLAND
PRIETO DIAZ
GUBAT
Abuyog
San Isidro
Balabag
Pilao
San Vincente
Banog
Anislog
Florista
Namanday
Pututan
Batan
Manando
Linao
Tabagian
Jorgon
Patiinan
Sawanga
Ogod
Dapdap
GEO



N13°30'

Provincial boundary

First and second class road

Route markers : National

Route markers : Provincial

EXPLAWTION

STRATIFIED ROCK

STRATIGRAPHY

CENOZOIC — TERTIARY — Miocene — Early — Middle — Late

CENOZOIC — TERTIARY — Oligocene — Early — Late

CENOZOIC — TERTIARY — Eocene — Paleocene

MESOZOIC — CRETACEOUS — Late

MESOZOIC — PRE-LATE CRETACEOUS

CENOZOIC — QUATERNARY — Holocene

CENOZOIC — QUATERNARY — Pleistocene — Early | Late

CENOZOIC — QUATERNARY — Pliocene — Early

CENOZOIC — QUATERNARY — Pliocene — Late

Qal — Terrace Gravel and Alluvial Deposits Generally Confined on River Floodplains.

Qvp — Quaternary widespread pyroclastic agglomerate, volcanic breccia, tuff, pumice and volcanic debris deposed around the Quaternary volcanic cones and volcanic plains.

Ql — Quaternary to Late Pliocene limestone generally coralline. Associated within layers of pyroclastic materials.

Pls — Pleistocene to Pliocene laminated ashy shales with interbeds of cinder sandstone.

PMs — Early Pliocene to Late Miocene widely exposed and extensive conglomerate, sandstone, calcareous siltstone and limestone.

PMc — Early Pliocene to Late Miocene Coralline, sandy and marly limestone, partly crystalline.

Ms — Miocene clastics formation composed of conglomerate, sandstone, calcareous shale, limestone, volcanic wackes, tuff-breccias.

Es — Late-Paleocene ~ Eocene conglomeratic, arkosic sandstone, silty tuffaceous and calcareous shale and graywacke.

IEø — Eocene limestone, locally recrystallized and fractured.

Efo — Eocene flysch and olistostrome.

Cs — Late-Cretaceous graywacke, chert, shale sequence with local intercalation of basalt and andesitic flows.

Ch — Late-Cretaceous cherty and oolitic limestone.

Cms — Late-Cretaceous metavolcanics.

Sch — Pre-Late Cretaceous Ophiolite: metamorphosed rock unit (schists); regionally metamorphosed high grade schist of amphibolite facies and lowgrade schist of the green schist and albite-epidote-amphibolite facies and quartzite.

PLCs — Pre-Late Cretaceous Ophiolite: low grade metamorphosed volcanics and related sediments.

UL — Pre-Late Cretacious Opiolite: ultramafic complex interlayered serpentinized peridotite, dunite, pyroxenite, gabbro, epidiorite, chromite.

INTRUSIVE AND PSEUDO-STRATIFIED ROCKS

Qv — Quaternary andesitic and dacitic volcanic deposit, occurring mainly as lava flows in volcanic centers.

TQv — Late tertiary to Early Quaternary andesite and basalt flow intercalated with agglomerate.

LMDi — Late Miocene Diorite occures as stocks dikes and sills of quartz diorite and dacite porphyry associated with andesite and syenite.

Tv — Tertiary andesite flows, breccias, tuffs with interbedded conglomerate, sandstone and shale.

Di — Early Miocene to Late Eocene Diorite Occures as stocks and dikes of granodiorite, hornblende and quartz diorite, andesite porphyry.

GEOLOGIC STRUCTURE

ISLAND

N13°

SIBUYAN SEA

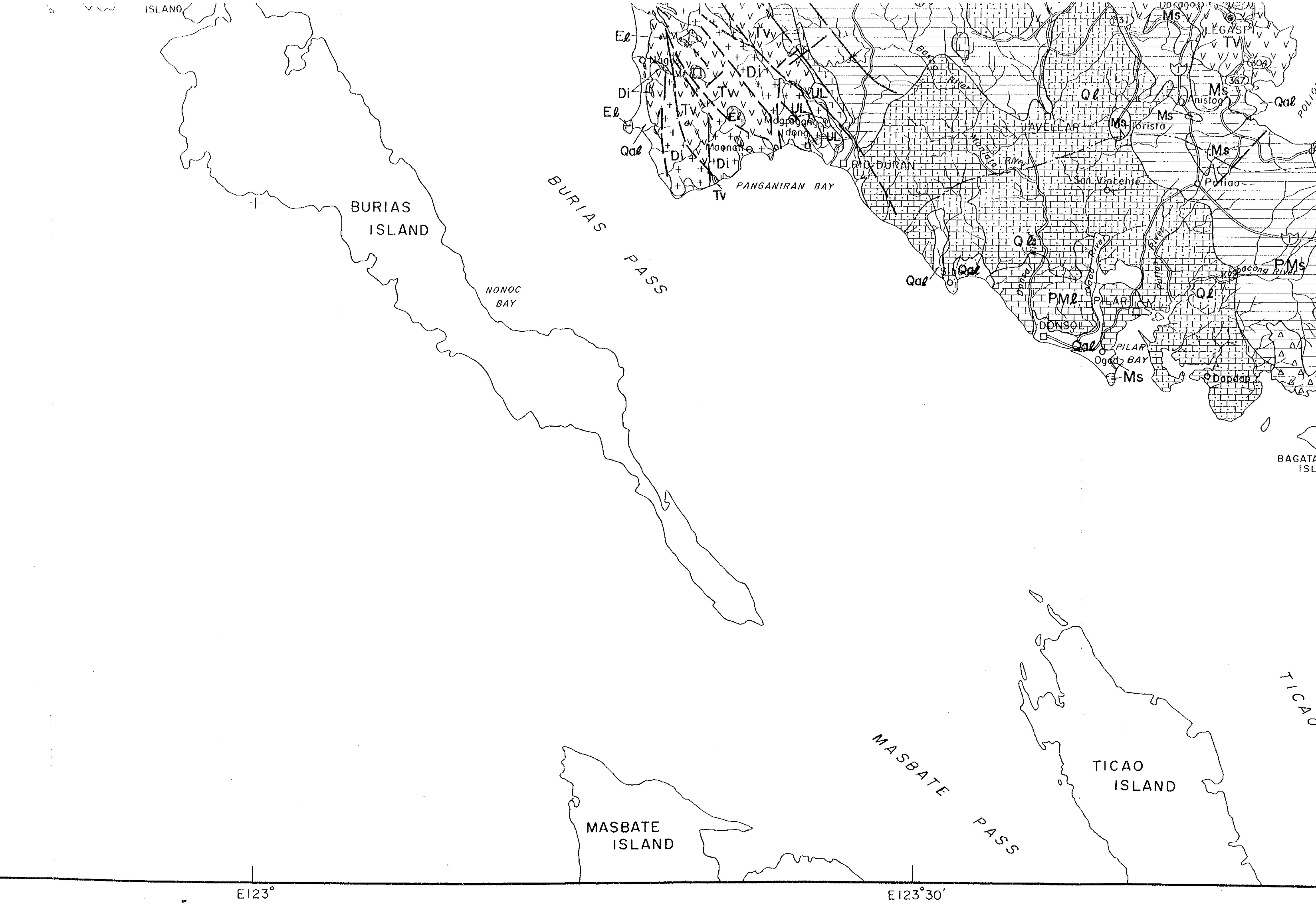
0 5 10 20 30 40 50km

N12°30′

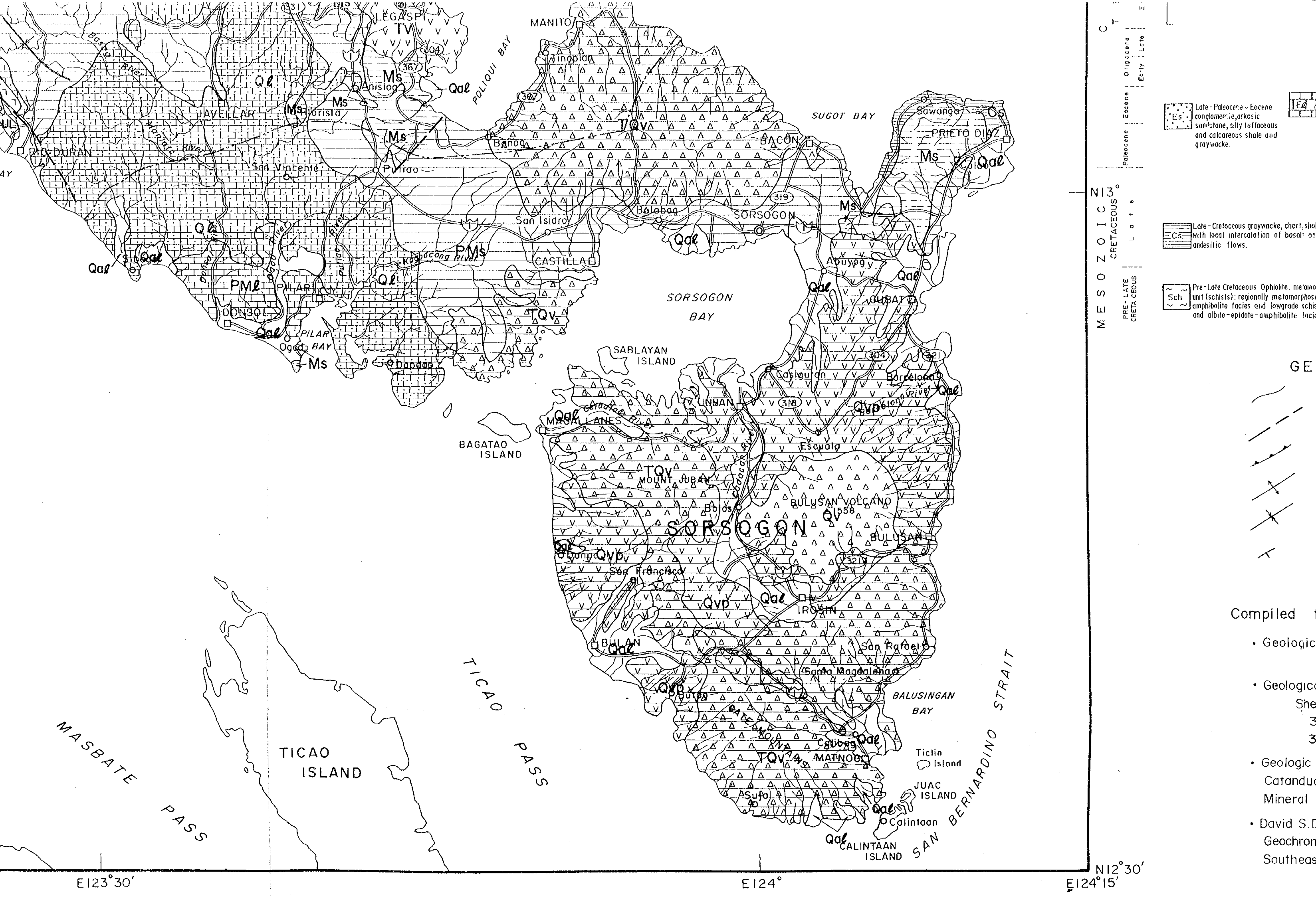
E122°10′

E122°30′

E123°



ISLAND
BURIAS ISLAND
NONOC BAY
BURIAS PASS
PANGANIRAN BAY
Eℓ
Di
Qaℓ
Tv
TV
UL
Nagta
Maganoy
Magragondong
PIO DURAN
Basag River
Mañapa River
JAVELLAR
Qℓ
Ms
Florista
Anislag
LEGASPI
Daraga
331
304
367
San Vincente
Putiao
Donsol River
Ogod River
Putiao River
Kagbacong River
PMs
PMℓ
PILAR
DONSOL
Sibago
PILAR BAY
Ogod
Dapdap
BAGATAO ISL
MASBATE PASS
MASBATE ISLAND
TICAO ISLAND
TICAO
E123°
E123°30′


LEGASPI
MANITO
POLIQUI BAY
SUGOT BAY
JAVELLAR
RIO DURAN
San Vincente
Putiao
Bacon
Banog
PRIETO DIAZ
Sawanga
San Isidro
Balabag
SORSOGON
CASTILLA
SORSOGON BAY
PILAR
DONSOL
PILAR BAY
Ogod
Dapdap
SABLAYAN ISLAND
BAGATAO ISLAND
MAGALLANES
JUBAN
Casiguran
Barcelona
Abuyog
GUBAT
Esquala
MOUNT JUBAN
BULUSAN VOLCANO
1558
SORSOGON
BULUSAN
Bolos
San Francisco
Donga
IROSIN
BULAN
San Rafael
Santa Magdalena
Butag
MATNOG
Calintaan
CALINTAAN ISLAND
BALUSINGAN BAY
Ticlin Island
JUAC ISLAND
SAN BERNARDINO STRAIT
TICAO PASS
TICAO ISLAND
MASBATE PASS
TQv
Qvp
Qv
Qal
Ql
Ms
PMs
PMl
TV
E123°30′
E124°
E124°15′
N13°
N12°30′
MESOZOIC
CRETACEOUS
Late
PRE-LATE CRETACEOUS
Paleocene
Eocene
Oligocene
Early
Late
Es
Late-Paleocene-Eocene conglomerate, arkosic sandstone, silty tuffaceous and calcareous shale and graywacke.
Cs
Late-Cretaceous graywacke, chert, shal
with local intercalation of basalt an
andesitic flows.
Sch
Pre-Late Cretaceous Ophiolite: metamo
unit (schists): regionally metamorphose
amphibolite facies and lowgrade schis
and albite-epidote-amphibolite facie
GE
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· Geologic
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· Geologic
Catandua
Mineral
· David S.D
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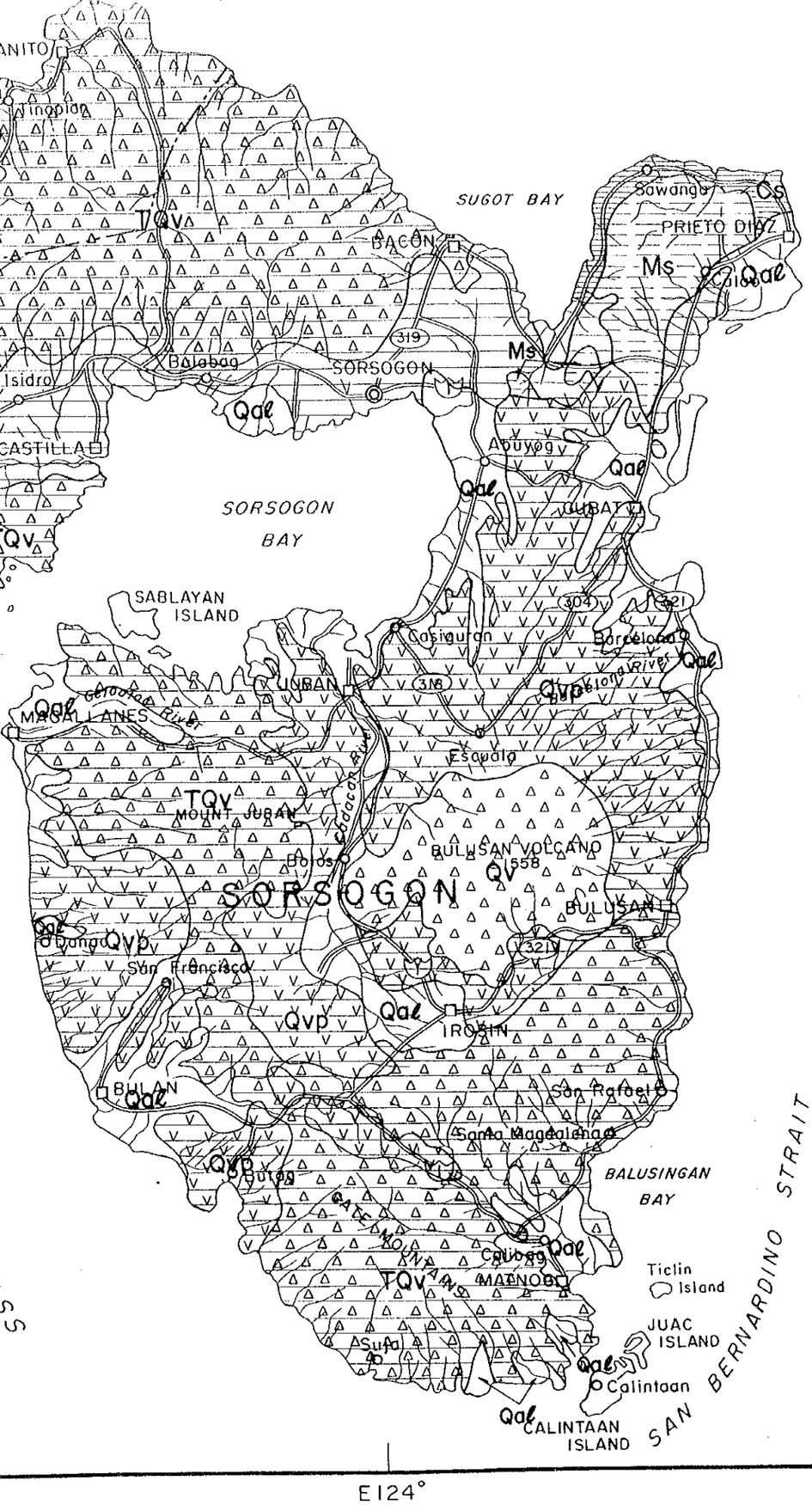
Southeas



MESOZOIC — CRETACEOUS — Late — PRE-LATE CRETACEOUS

CENOZOIC — Paleocene — Eocene — Oligocene — Early — Late

Late-Paleocene - Eocene conglomerate, arkosic sandstone, silty tuffaceous and calcareous shale and graywacke. (Es)

Eocene limestone, locally recrystallized and fractured. (El)

Eocene flysch and olistostrome. (Efo)

Early Miocene to Late Eocene Diorite
Occures as stocks and dikes of granodiorite, hornblende and quartz diorite, andesite porphyry. (Di)

Late-Cretaceous graywacke, chert, shale sequence with local intercalation of basalt and andesitic flows. (Cs)

Late-Cretaceous cherty and oolitic limestone. (Cl)

Late-Cretaceous metavolcanics. (Cms)

Pre-Late Cretaceous Ophiolite: metamorphosed rock unit (schists): regionally metamorphosed high grade schist of amphibolite facies and lowgrade schist of the green schist and albite-epidote-amphibolite facies and quartzite. (Sch)

Pre-Late Cretaceous Ophiolite: low grade metamorphosed volcanics and related sediments. (PLCs)

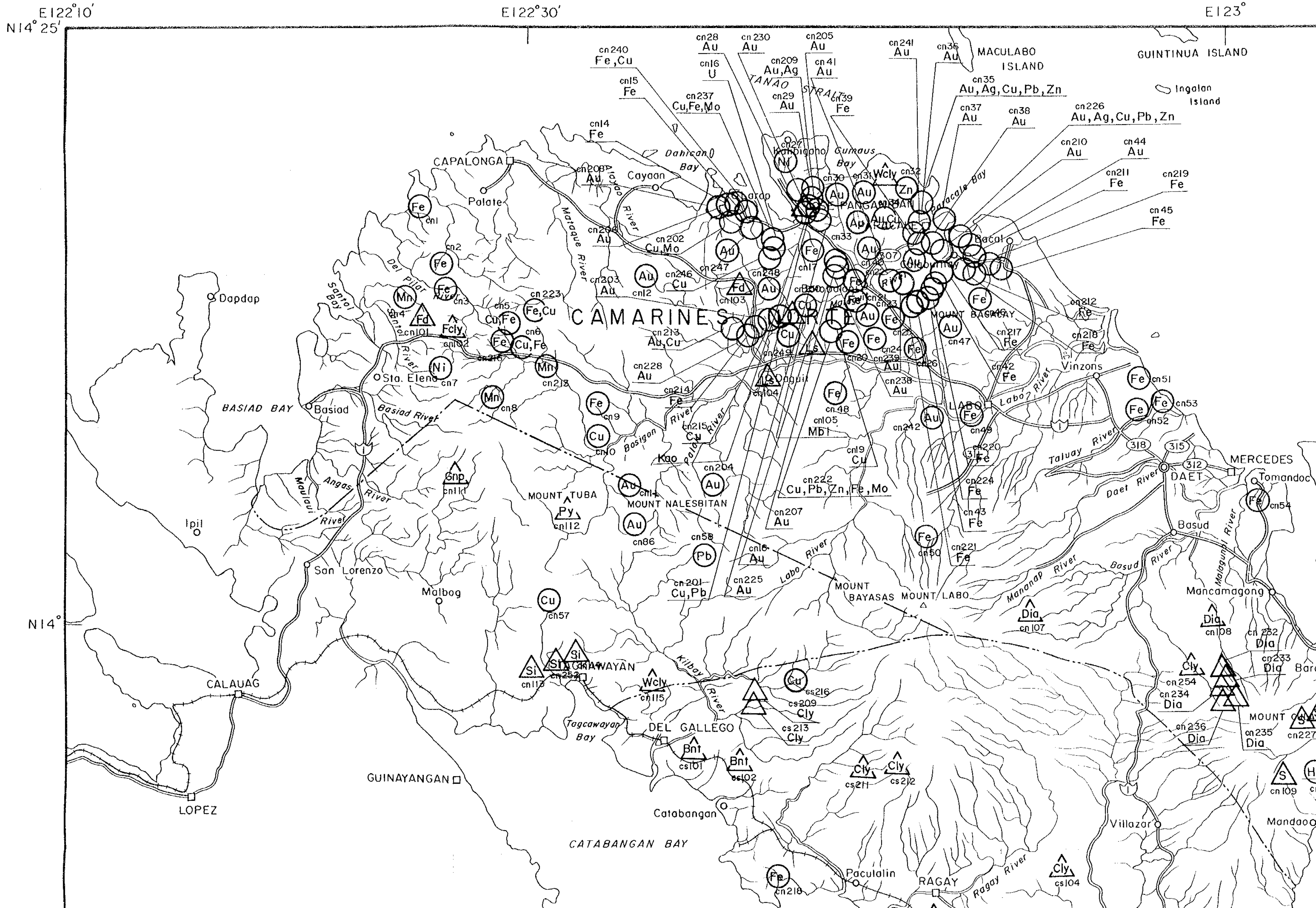
Pre-Late Cretacious Opiolite: ultramafic complex Interlayered serpentinized peridotite, dunite, pyroxenite, gabbro, epidiorite, chromite. (UL)

GEOLOGIC STRUCTURE

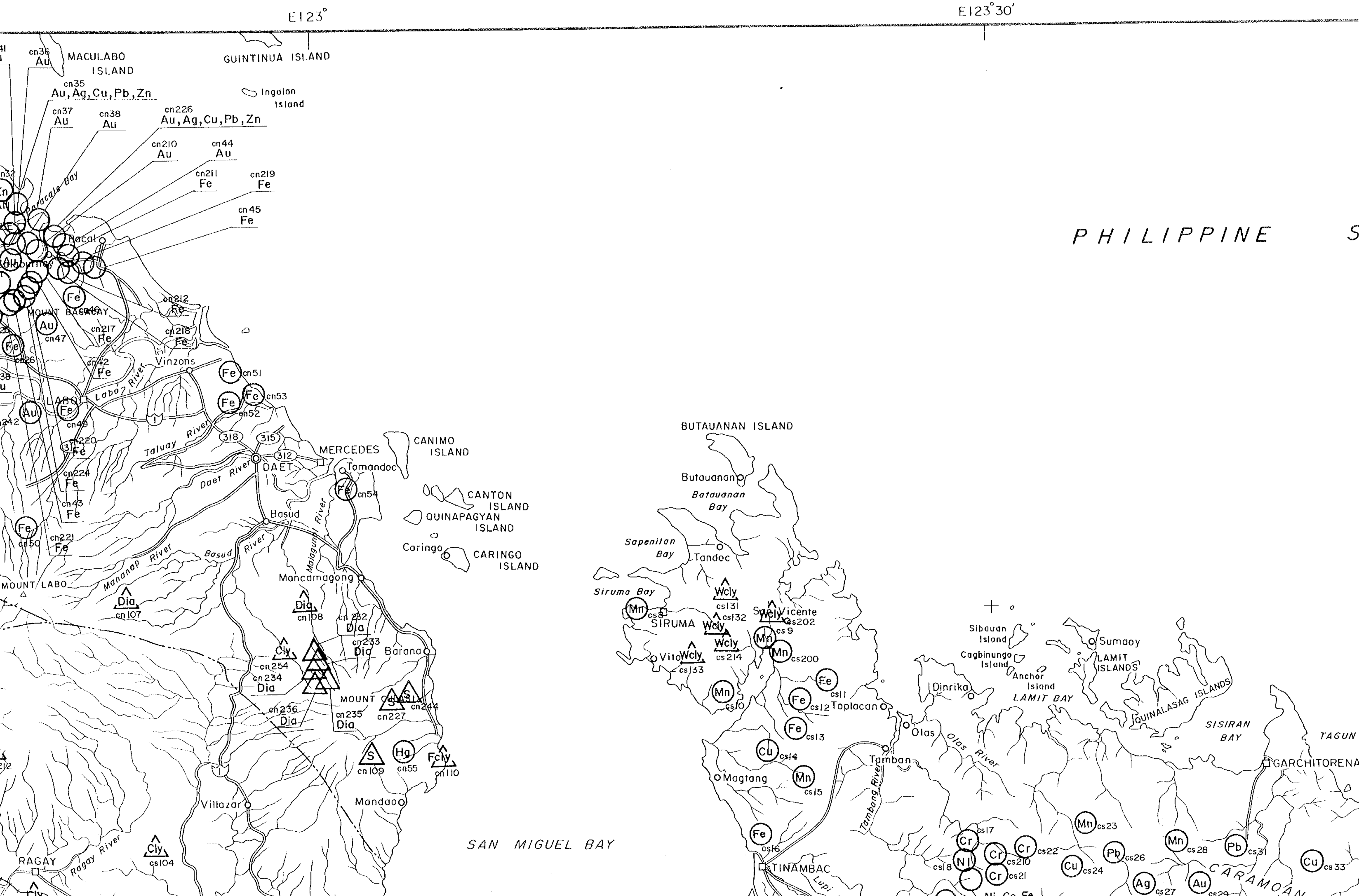
- Formational boundary
- Major fault
- Thrust fault
- Plunging anticline
- Plunging syncline
- Strike and dip of bedding plane

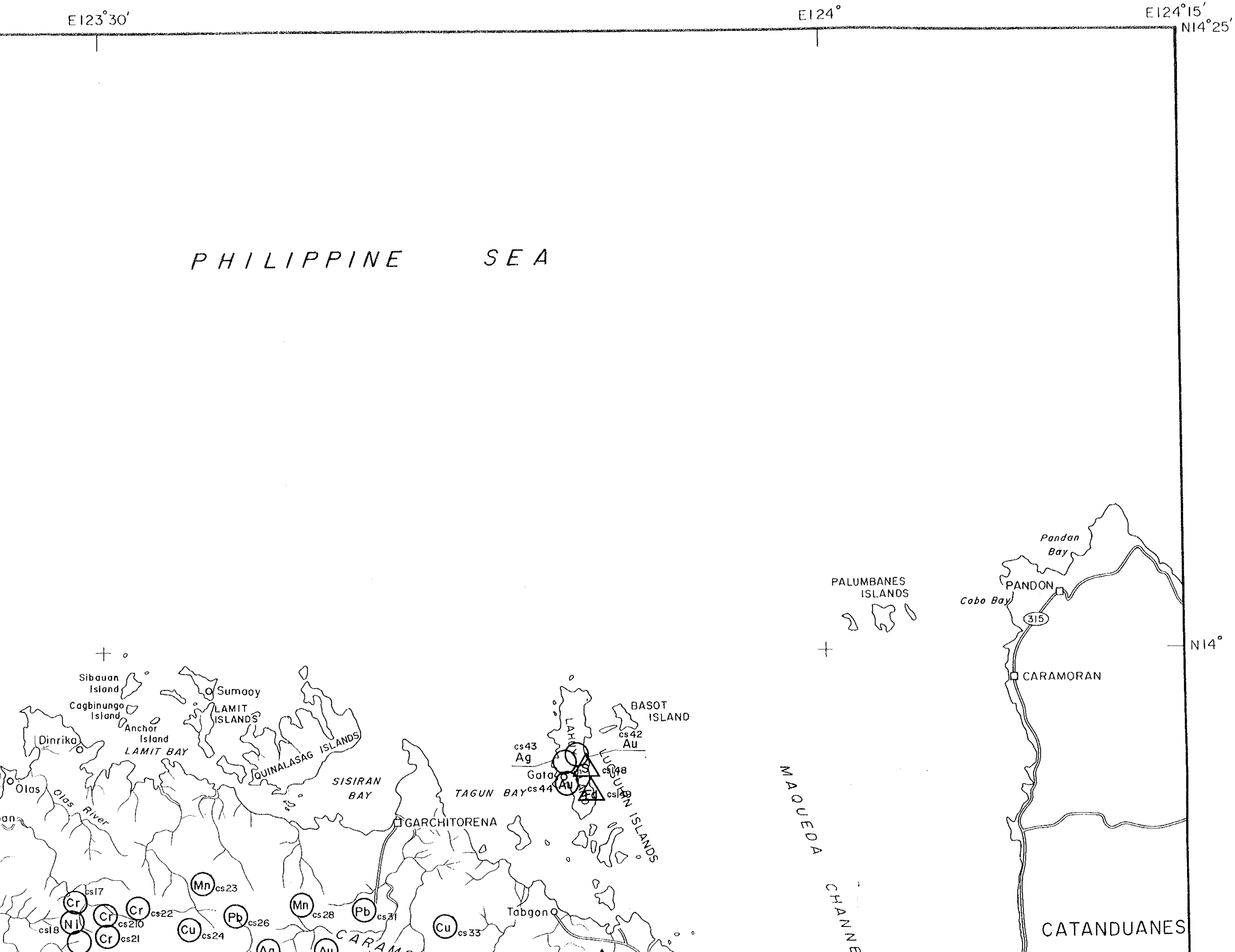
Compiled from:

- Geologic Map of Bicol Region (1:250,000) by BMG Regional Office V
- Geological Map Quadrangles (1:50,000) of Sheet No. 3462-I, II, 3560-I, 3561-I, II, III, IV 3562-I, II, III, IV, 3563-II, III, 3659-I, II 3661-I, II, III, IV, 3662-II, III, 3761-I II III IV
- Geologic and Geochemical Interpretation Map of Catanduanes Island (1:125,000) / The Cooperative Mineral Exploration by JICA/MMAJ - MGB, 1993-1995
- David S.D. Jr., et al (1996): Geology, Geohemistry, Geochronology and Structures of the Ophiolites in Southeastern Luzon, Philippnes. Jour. Soc. Geol. Phil. 1996.



E122°10'
E122°30'
E123°
N14°25'
N14°
CAMARINES NORTE
MACULABO ISLAND
GUINTINUA ISLAND
Ingalan Island
TANAO STRAIT
Dahican Bay
Gumaus Bay
Paracale Bay
Santol Bay
BASIAD BAY
Tagcawayan Bay
CATABANGAN BAY
CAPALONGA
Palate
Cayaan
Dapdap
Sta. Elena
Basiad
Ipil
San Lorenzo
Malbog
CALAUAG
LOPEZ
GUINAYANGAN
TAGCAWAYAN
DEL GALLEGO
Catabangan
Paculalin
RAGAY
PARACALE
Bacal
Daguit
LABO
Vinzons
DAET
MERCEDES
Tomandoc
Basud
Mancamagong
Villazar
Mandao
MOUNT TUBA
MOUNT NALESBITAN
MOUNT BAYASAS
MOUNT LABO
MOUNT BAGACAY
Del Pilar River
Santol River
Basiad River
Angas River
Maulaui River
Mataque River
Alayao River
Basigon River
Labo River
Kilbay River
Taluay River
Daet River
Mananap River
Basud River
Malaguni River
Ragay River
cn240 Fe,Cu
cn15 Fe
cn14 Fe
cn28 Au
cn16 U
cn237 Cu,Fe,Mo
cn230 Au
cn209 Au,Ag
cn29 Au
cn205 Au
cn41 Au
cn39 Fe
cn241 Au
cn36 Au
cn35 Au,Ag,Cu,Pb,Zn
cn37 Au
cn38 Au
cn226 Au,Ag,Cu,Pb,Zn
cn210 Au
cn44 Au
cn211 Fe
cn219 Fe
cn45 Fe
cn208 Au
cn206 Au
cn202 Cu,Mo
cn203 Au
cn246 Cu
cn213 Au,Cu
cn228 Au
cn214 Fe
cn215 Cu
Kao
cn204
cn222 Cu,Pb,Zn,Fe,Mo
cn207 Au
cn16 Au
cn225 Au
cn201 Cu,Pb
cn105 Mbl
cn19 Cu
cn238 Au
cn239 Au
cn212 Fe
cn217 Fe
cn218 Fe
cn42 Fe
cn220 Fe
cn224 Fe
cn43 Fe
cn221 Fe
cn1 Fe
cn2 Fe
cn3 Fe
cn4 Mn
cn5 Cu,Fe
cn6 Cu,Fe
cn223 Fe,Cu
cn7 Ni
cn8 Mn
cn9 Fe
cn10 Cu
cn12 Au
cn27 Ni
cn47 Au
cn48 Fe
cn49 Fe
cn50 Fe
cn51 Fe
cn52 Fe
cn53 Fe
cn54 Fe
cn57 Cu
cn58 Pb
cn86 Au
cn101 Fd
cn102 Fcly
cn103 Fd
cn104 Ls
cn111 Gnp
cn112 Py
cn113 Si
cn115 Wcly
cn242
cn247
cn248
cn249
cn107 Dia
cn108 Dia
cn232 Dia
cn233 Dia
cn234 Dia
cn235 Dia
cn236 Dia
cn254 Cly
cn109 S
cn227
cs101 Bnt
cs102 Bnt
cs104 Cly
cs209 Cly
cs211 Cly
cs212 Cly
cs213 Cly
cs216 Cu
cn218 Fe
307
318
315
312


E123°
E123°30′
MACULABO ISLAND
GUINTINUA ISLAND
Ingalan Island
PHILIPPINE S
cn36 Au
cn35 Au, Ag, Cu, Pb, Zn
cn37 Au
cn38 Au
cn226 Au, Ag, Cu, Pb, Zn
cn210 Au
cn44 Au
cn211 Fe
cn219 Fe
cn45 Fe
Paracale Bay
Bacal
MOUNT BAGACAY
cn212 Fe
cn217 Fe
cn218 Fe
cn47
cn42 Fe
Vinzons
Labo River
LABO
cn49
cn51
cn53
cn52
Taluay River
318
315
312
MERCEDES
CANIMO ISLAND
DAET
Tomandoc
Daet River
cn220 Fe
cn224 Fe
cn43 Fe
cn54
CANTON ISLAND
QUINAPAGYAN ISLAND
Basud
Malaguinoi River
cn221 Fe
cn50
Caringo
CARINGO ISLAND
Mananap River
Basud River
MOUNT LABO
Mancamagong
Dia cn107
Dia cn108
cn232 Dia
cn233 Dia
Barana
cn254
cn234 Dia
MOUNT
cn244
cn227
cn236 Dia
cn235 Dia
cn109
cn55
cn110
Villazar
Mandao
SAN MIGUEL BAY
RAGAY
Ragay River
Cly cs104
BUTAUANAN ISLAND
Butauanan
Batauanan Bay
Sapenitan Bay
Tandoc
Sirumo Bay
cs8
SIRUMA
Wcly cs131
cs132
San Vicente
cs202
cs9
Wcly cs214
Vito
cs133
cs200
cs11
cs12
Toplacan
cs10
cs13
cs14
Magtang
cs15
Tamban
Tambang River
Olas
Olas River
Sibauan Island
Cagbinungo Island
Anchor Island
Sumaoy
LAMIT ISLANDS
Dinrika
LAMIT BAY
QUINALASAG ISLANDS
SISIRAN BAY
TAGUN
GARCHITORENA
cs16
TINAMBAC
Lupi
cs17
cs18
cs210
cs21
cs22
cs23
cs24
cs26
cs27
cs28
cs29
cs31
cs33
CARAMOAN



E123°30′
E124°
E124°15′
N14°25′
N14°
PHILIPPINE SEA
PALUMBANES ISLANDS
Pandan Bay
PANDON
Cobo Bay
315
CARAMORAN
CATANDUANES
MAQUEDA CHANNE
BASOT ISLAND
Sibauan Island
Cagbinungo Island
Anchor Island
Sumaoy
LAMIT ISLANDS
Dinrika
LAMIT BAY
QUINALASAG ISLANDS
SISIRAN BAY
TAGUN BAY
GARCHITORENA
Olas
Olas River
Gata
Tabgon
cs42 Au
cs43 Ag
cs44
cs48
cs49
cs17
cs18
cs21
cs210
cs22
cs23
cs24
cs26
cs28
cs31
cs33

Fig.I-

E124°

E124°15′

N14°25′

N14°

Pandan Bay

PANDON

Cobo Bay

315

PALUMBANES ISLANDS

CARAMORAN

BASOT ISLAND

cs42

Au

cs48

cs49

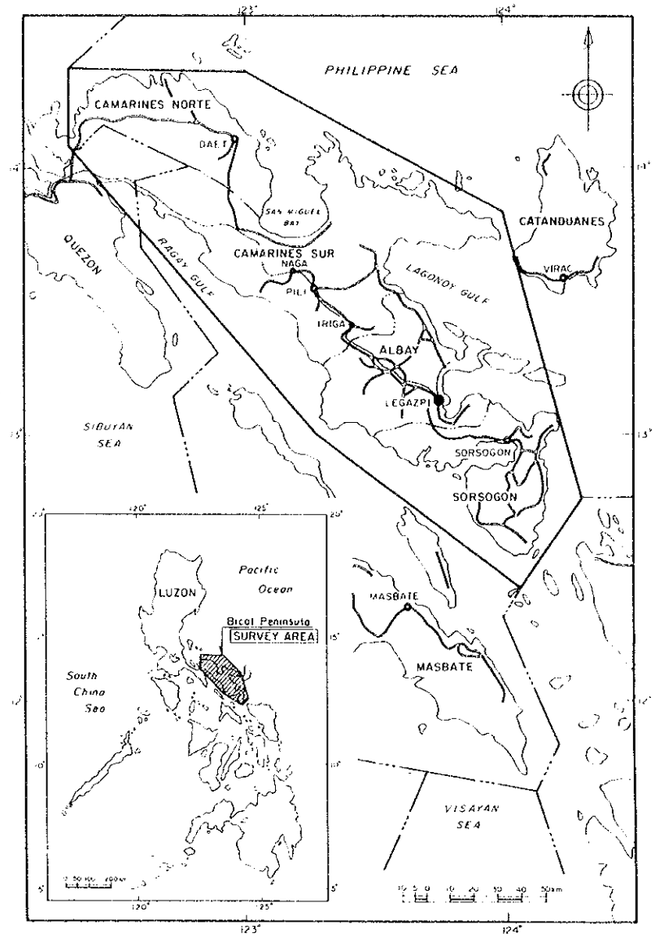
HUGUAN ISLANDS

MAQUEDA CHANNEL

CATANDUANES ISLAND

Plate2

REGIONAL SURVEY FOR MINERAL RESOURCES IN THE BICOL AREA THE REPUBLIC OF THE PHILIPPINES

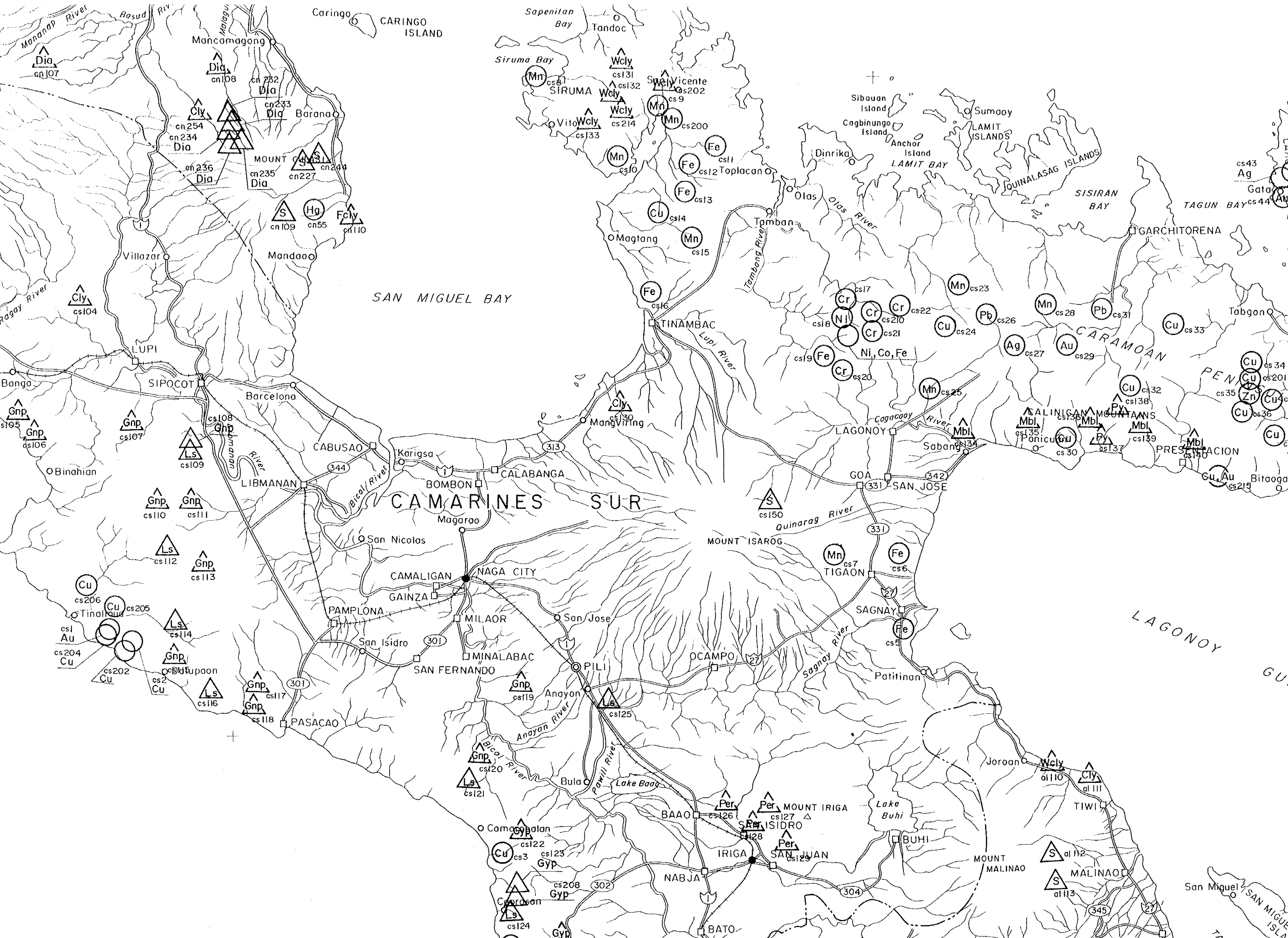


Scale 1 : 250,000

0 5 10 15 20 km

Fig.I-3-7 Location map of ore deposits, mineral


N14°
N13°30'
San Lorenzo
Malbog
MOUNT BAYASAS
MOUNT LABO
Mancamagong
Cu cn57
cn201 Cu,Pb
cn225 Au
Dia cn107
Dia cn108
cn232 Dia
cn233 Dia
Si cn113
Si cn114
Si cn252
Wcly cn115
Kilbay River
Cu cs216
cs209 Cly
cs213 Cly
Cly cn254
cn234 Dia
cn236 Dia
cn235 Dia
cn227
CALAUAG
Tagcawayan Bay
DEL GALLEGO
Bnt cs101
Bnt cs102
Cly cs211
Cly cs212
cn109
LOPEZ
GUINAYANGAN
Catabangan
CATABANGAN BAY
Villazar
Mandaoo
Fe cn218
Paculalin
RAGAY
Ragay River
Cly cs104
Cly cs103
RAGAY BAY
LUPI
Banga
SIPOCOT
Barcelona
BUENAVISTA
PERIS BAY
Gnp cs105
Gnp cs106
Gnp cs107
cs108 Ghp
Ls cs109
CAIMA BAY
Binahian
Libmanan River
LIBMANAN
GENERAL LUNA
Gnp cs110
Gnp cs111
Ls cs112
Gnp cs113
Cu cs206
Tinalmud
Cu cs205
Ls cs114
csl Au
cs204 Cu
Gnp cs115
Oldupaon
cs202 Cu
cs2 Cu
Ls cs116
Gnp cs117
Gnp cs118
301
PASAC
CATANAUAN
SAN NARCISO
MULANAY
BONDOC PENINSULA
GULF
ALIBIJABAN ISLAND



Caringo
CARINGO ISLAND
SAN MIGUEL BAY
CAMARINES SUR
LAGONOY
Sapenitan Bay
Tandoc
Siruma Bay
SIRUMA
San Vicente
Vito
Toplacan
Olas
Olas River
Tamban
Tambang River
Magtang
TINAMBAC
Lupi River
Sibauan Island
Cagbinungo Island
Anchor Island
Sumaoy
LAMIT ISLANDS
LAMIT BAY
Dinrika
QUINALASAG ISLANDS
SISIRAN BAY
TAGUN BAY
GARCHITORENA
CARAMOAN
Tabgon
CALINIGAN MOUNTAINS
Panicuason
PRESENTACION
Bitaogan
LAGONOY
Cagacaoy River
Sabang
GOA
SAN JOSE
Quinarag River
MOUNT ISAROG
TIGAON
SAGNAY
Sagnay River
Patitinan
Joroan
TIWI
MALINAO
San Miguel
MOUNT MALINAO
Lake Buhi
BUHI
MOUNT IRIGA
SAN ISIDRO
SAN JUAN
IRIGA
NABJA
BATO
BAAO
Lake Baao
Bula
Pawili River
Bicol River
Anayan River
Anayon
PILI
OCAMPO
San Jose
NAGA CITY
CAMALIGAN
GAINZA
MILAOR
MINALABAC
SAN FERNANDO
San Isidro
PAMPLONA
PASACAO
San Nicolas
Magarao
BOMBON
CALABANGA
Karigsa
Mangvirang
CABUSAO
Barcelona
LIBMANAN
Libmanan River
Bicol River
SIPOCOT
LUPI
Bangu
Binahian
Villazar
Mandaon
MOUNT CAGSAO
Barana
Mancamagong
Mananap River
Bosud River
Ragay River
Tinalmud
Dalupaon
Camagoalan
Corrason
Mn cs8
Wcly cs131
Wcly cs132
Wcly cs202
Mn cs9
Wcly cs214
Wcly cs133
Mn cs200
Fe cs11
Fe cs12
Fe cs13
Mn cs10
Cu cs14
Mn cs15
Fe cs16
Cr cs17
Ni cs18
Cr cs210
Cr cs21
Cr cs22
Ni, Co, Fe
Fe cs19
Cr cs20
Mn cs23
Cu cs24
Pb cs26
Mn cs28
Pb cs31
Cu cs33
Ag cs27
Au cs29
Ag cs43
Gata
cs44
Mn cs25
Cu cs32
cs138
Mbl cs135
cs136
Mbl
Py
Mbl cs139
Mbl cs134
Cu cs30
Py cs137
Mbl cs140
Cu, Au cs215
Cu cs34
Cu cs201
cs35
Zn
Cu cs36
Cu
S cs150
Mn cs7
Fe cs6
Fe cs5
Cly cs130
Dia cn107
Dia cn108
cn232 Dia
cn233 Dia
Cly cn254
cn234 Dia
cn236 Dia
cn235 Dia
S cn227
S cn244
S cn109
Hg cn55
Fcly cn110
Cly cs104
Gnp cs105
Gnp cs106
Gnp cs107
cs108 Gnp
Ls cs109
Gnp cs110
Gnp cs111
Ls cs112
Gnp cs113
Cu cs206
Cu cs205
cs1 Au
cs204 Cu
cs202 Cu
cs2 Cu
Ls cs114
Gnp cs115
Ls cs116
Gnp cs117
Gnp cs118
Gnp cs119
Ls cs125
Gnp cs120
Ls cs121
Per cs126
Per cs127
Per cs128
Per cs129
Gyp cs122
Cu cs3
cs123 Gyp
cs208 Gyp
Ls cs124
Gyp
Wcly al110
Cly al111
S al112
S al113
1
313
344
342
331
27
301
302
304
345

Fig.I-3

LEG

Keys

prospects

metallic resou

Ag

Al

Au

PALUMBANES ISLANDS

PANDON

Cobo Bay

315

N14°

CARAMORAN

CATANDUANES ISLAND

MAQUEDA CHANNEL

BASOT ISLAND

cs42 Au

cs43 Ag

Gata

cs44

cs48

cs49

LAHUY

CUYUIN ISLANDS

TAGUN BAY

SISIRAN BAY

GARCHITORENA

Sibauan Island

Cagbinungo Island

Anchor Island

Sumaoy

LAMIT ISLANDS

QUINALASAG ISLANDS

LAMIT BAY

Dinrika

Olas

Olas River

Mn cs23

cs17

Cr

Ni

Cr cs22

Cr cs210

Cr cs21

cs18

Ni, Co, Fe

cs19 Fe

Cr cs20

Pb cs26

Cu cs24

Mn cs28

Pb cs31

Ag cs27

Au cs29

CARAMOAN PENINSULA

Tabgon

Cu cs33

Cu cs34

Cu cs201

cs35 Zn

Cu cs37

Cu cs36

Gnp cs141

Mn cs40

Ls cs143

Gnp cs144

CARAMOAN

Ls

Fe cs39

Mbl cs142

Talo cs145

Fcly cs146

Fcly cs147

Calongcocon

Cu cs38

Mn cs41

Mn cs25

Cu cs32

cs138

Py

SALINLAGAN MOUNTAINS

Mbl cs136

Mbl cs135

Mbl cs139

Py cs137

Cogacay River

LAGONOY

Mbl cs134

Sabang

Panicuan

Gu cs30

PRESENTACION

Mbl cs140

Cu, Au cs215

Bitaogan

GOA

331

342

SAN JOSE

Quinarag River

331

Mn cs7

TIGAON

Fe cs6

27

SAGNAY

Fe cs5

Sagnay River

Patitinan

LAGONOY GULF

SAN ANDRES

VIRAC

301

CABUGAO BAY

N13°30'

Joroan

Wcly al110

Cly al111

TIWI

MOUNT IRIGA

cs127

Lake Buhi

BUHI

MOUNT MALINAO

S al112

MALINAO

S al113

304

345

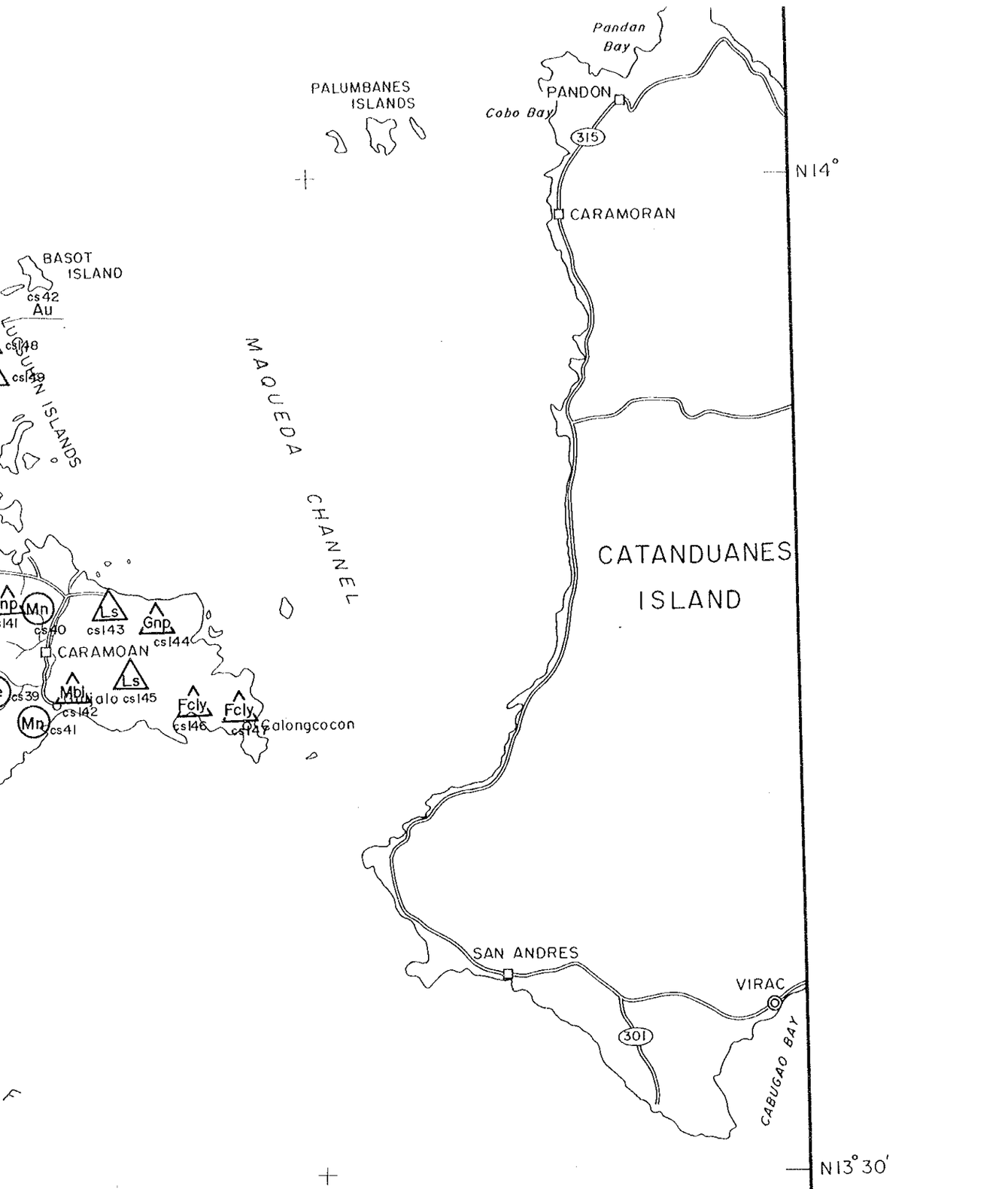
27

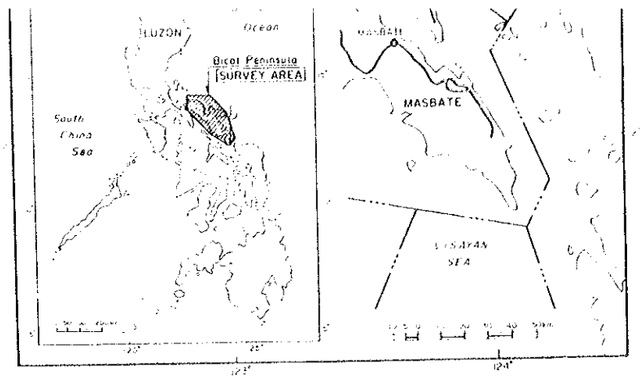
San Miguel

SAN MIGUEL ISL

T

310





Scale 1 : 250,000

0 5 10 15 20 km

Fig.I-3-7 Location map of ore deposits, mineral showings, and geochemical anomaly in the Bicol Area

LEGEND

- ● Chartered city
- ◉ City capital of province
- ◎ Capital of province
- □ Municipality or municipal district
- ○ Barangay
- Railroad
- Provincial boundary
- First and second class road
- (1) Route markers : National
- (310) Route markers : Provincial

Keys

prospects

- ○ Metallic Mineral Resources
- △ Non-Metallic Mineral Resources

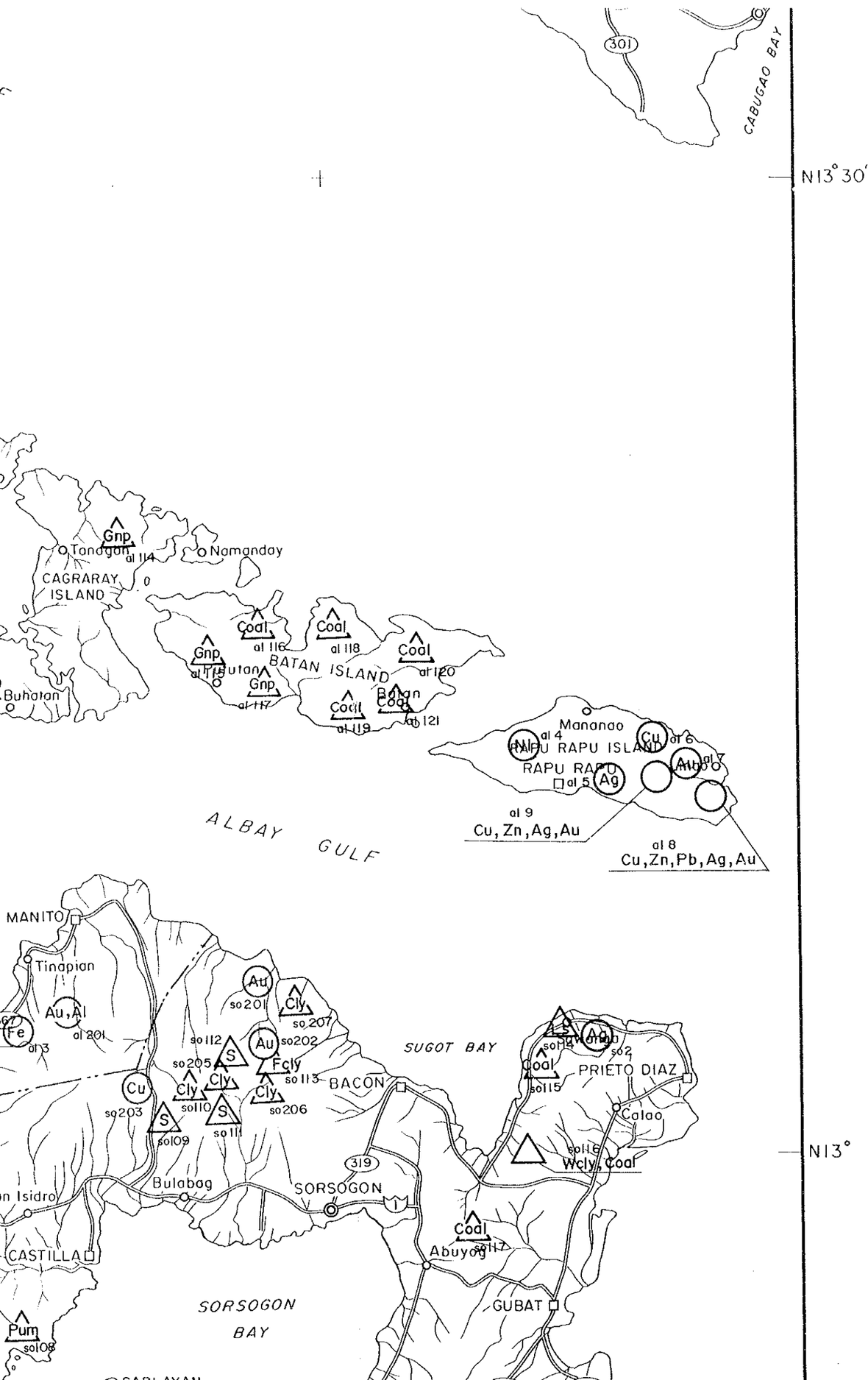
metallic resources

- Ag Silver


SAN NARCISO
MULANAY
N13°30'
BONDOC PENINSULA
ALIBIJABAN ISLAND
SAN ANDRES
TEMPLO ISLAND
BUSING ISLAND
N13°
csl Au
cs204 Cu
cs202 Cu
cs2 Cu
Ls
cs114
Gnp
Ls
cs116
Gnp
cs117
Gnp
cs118
301
PAS

MINALABAC
SAN FERNANDO
PILI
OCAMPO
Patitinan
PASACAO
Anayon
Anayan River
Bicol River
Pawili River
Lake Baao
Bula
BAAO
MOUNT IRIGA
SAN ISIDRO
IRIGA
SAN JUAN
NABJA
Lake Buhi
BUHI
MOUNT MALINAO
Joroan
TIWI
MALINAO
TABACO
MALILIPOTO
Tabagian
Camarobalan
Caorasan
Balatan
Palo
BATO
Lake Bato
LIBON
POLANGUI
OAS
LIGAO
MAYON VOLCANO
2421
STO. DOMING
Carnagong
Pantao
ALBAY
GUINOBATAN
CAMALIG
Daraga
LEGASPI
Talisay River
MALAMA
Basag River
Nagas
Magragong dong
Maonon
RIO DURAN
PANGANIRAN BAY
JAVELLAR
Florista
Anislog
Manlato River
San Vincente
Putiao
TEMPLO ISLAND
BUSING ISLAND
BURIAS ISLAND
BURIAS PASS
NONOC BAY
Sibago
Donsol River
Ogod River
DONSOL
PILAR
PILAR BAY
Ogod
Dapdap
Kagbacon
Cu
Gnp
Ls
Gyp
Per
S
Wcly
Cly
Fe
cs204
cs202
cs2
cs115
cs116
cs117
cs118
cs119
cs120
cs121
cs122
cs123
cs124
cs125
cs126
cs127
cs128
cs129
cs207
cs208
cs3
cs4
al 1
al 2
al 101
al 102
al 103
al 104
al 105
al 106
al 107
al 110
al 111
al 112
al 113
al 202
al 203
al 204
al 205
so 1
so 101
so 102
so 103
so 104
so 105
so 106
1
27
301
302
304
316
330
331
340
345
367


N13°30'
N13°
Keys
prospects
metallic resour
Ag
Al
Au
Co
Cr
Cu
Fe
Hg
Mn
Mo
Ni
Pz
U
Zn
non-metallic
Bnt
Ccly
Cly
Coal
Dia
Fcly
Fd
Gnp
Gyp
Kao
Ls
Mbl
Per
Pum
Py
S
Si
Wcly
ALBAY
ALBAY GULF
TABACO BAY
POLIQUI BAY
SUGOT BAY
SORSOGON BAY
MAYON VOLCANO
△ 2421
MOUNT MALINAO
MOUNT IRIGA
Lake Buhi
SAN MIGUEL ISLAND
CAGRARAY ISLAND
BATAN ISLAND
RAPU RAPU ISLAND
SABLAYAN ISLAND
Joroan
TIWI
BUHI
MALINAO
TABACO
MALILIPOTO
Tobagian
POLANGUI
OAS
LIGAO
GUINOBATAN
CAMALIG
STO. DOMINGO
Salvacion
Pili
Buhatan
San Miguel
Tanagan
Namanday
Rutuan
Batan
Mananao
RAPU RAPU
Daraga
LEGASPI
MANITO
Tinapian
Anislag
Florista
JAVELLAR
MALAMA
RIO DURAN
San Vincente
Putiao
Bañog
San Isidro
CASTILLA
Bulabag
SORSOGON
BACON
PRIETO DIAZ
Calao
Abuyog
GUBAT
Barcelona
Casiguran
JUBAN
Dapdap
Sibago
DONSOL
PILAR
Ogod
PILAR BAY
al 9
Cu, Zn, Ag, Au
al 8
Cu, Zn, Pb, Ag, Au
Wcly, Coal
Au, Al
Basag River
Manlato River
Donsol River
Ogod River
Kogbacong River
Talisay



Provincial boundary

First and second class road

1 Route markers : National

310 Route markers : Provincial

Keys

prospects

- Metallic Mineral Resources
- Non-Metallic Mineral Resources

metallic resources

Ag	Silver
Al	Aluminum
Au	Gold
Co	Cobalt
Cr	Chromium
Cu	Copper
Fe	Iron
Hg	Mercury
Mn	Manganese
Mo	Molybdenum
Ni	Nickel
Pz	Lead
U	Uranium
Zn	Zinc

non-metallic resources

Bnt	Bentonite
Ccly	China Clay
Cly	Clay
Coal	Coal
Dia	Diatomaceous Earth
Fcly	Flint Clay
Fd	Feldsper
Gnp	Guano-Phosphate
Gyp	Gypsum
Kao	Kaoline
Ls	Limestone
Mbl	Marble
Per	Perlite
Pum	Pumice
Py	Pyrite
S	Sulfur
Si	Silica
Wcly	White Clay

N13°

SIBUYAN SEA

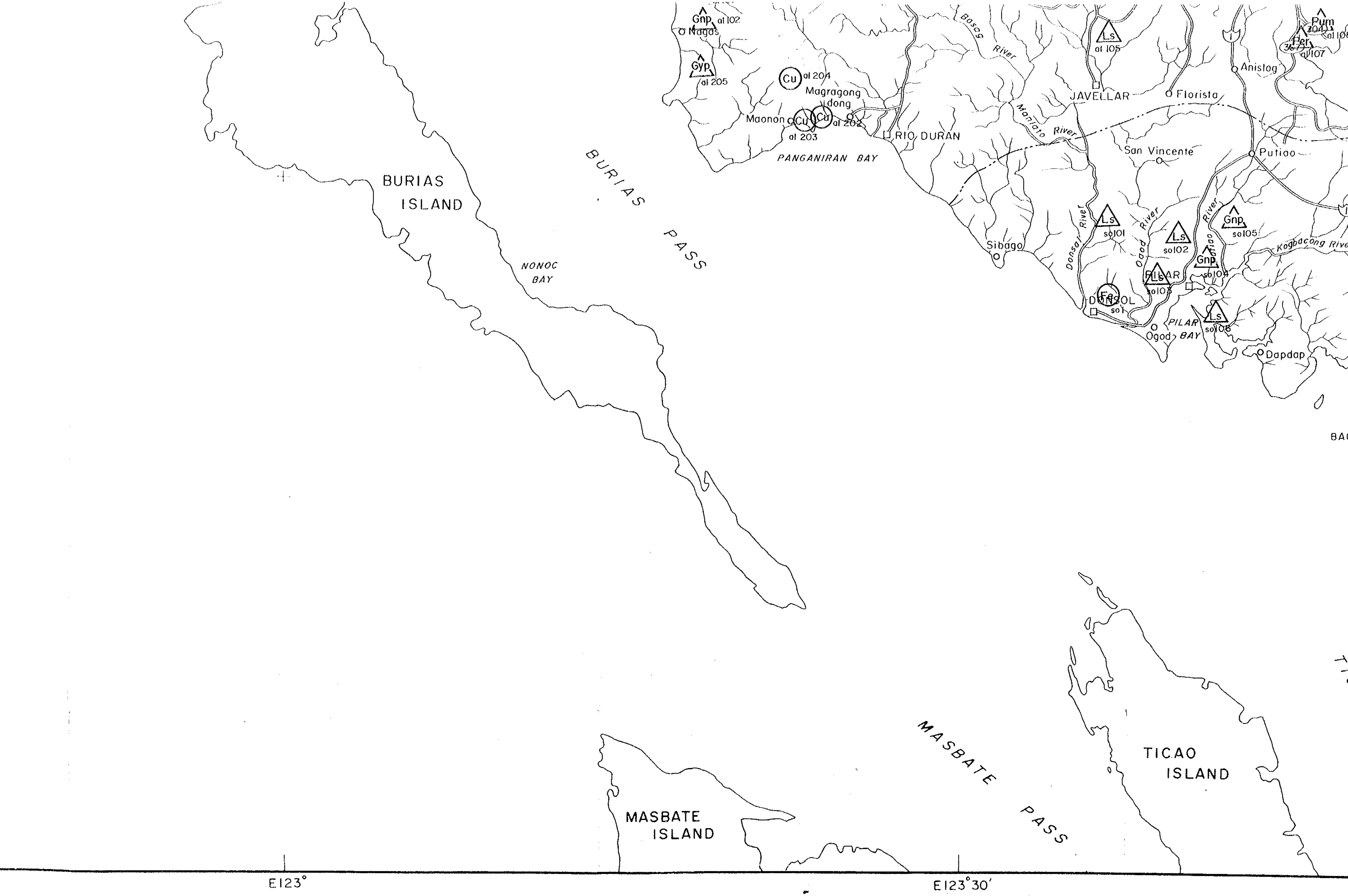
0 5 10 20 30 40 50km

N12°30'

E122°10'

E122°30'

E123°


Gnp
al 102
Nagas
Gyp
al 205
Cu
al 204
Magragong
dong
Maonon
Cu
Cu
al 202
al 203
RIO DURAN
PANGANIRAN BAY
Basag River
Ls
al 105
JAVELLAR
Florista
Anislog
Pum
Per
al 107
Maniato River
San Vincente
Putiao
Sibago
Donsal River
Ls
so101
Ogod River
Ls
so102
Gnp
so105
Kagbacong River
Gnp
so104
PILAR
Ls
so103
Fe
DONSOL
Ls
so106
Ogod
PILAR BAY
Dapdap
BURIAS ISLAND
BURIAS PASS
NONOC BAY
MASBATE PASS
TICAO ISLAND
MASBATE ISLAND
E123°
E123°30′

SORSOGON

Coal
Dia
Fcly
Fd
Gnp
Gyp
Kao
Ls
Mbl
Per
Pum
Py
S
Si
Wcly

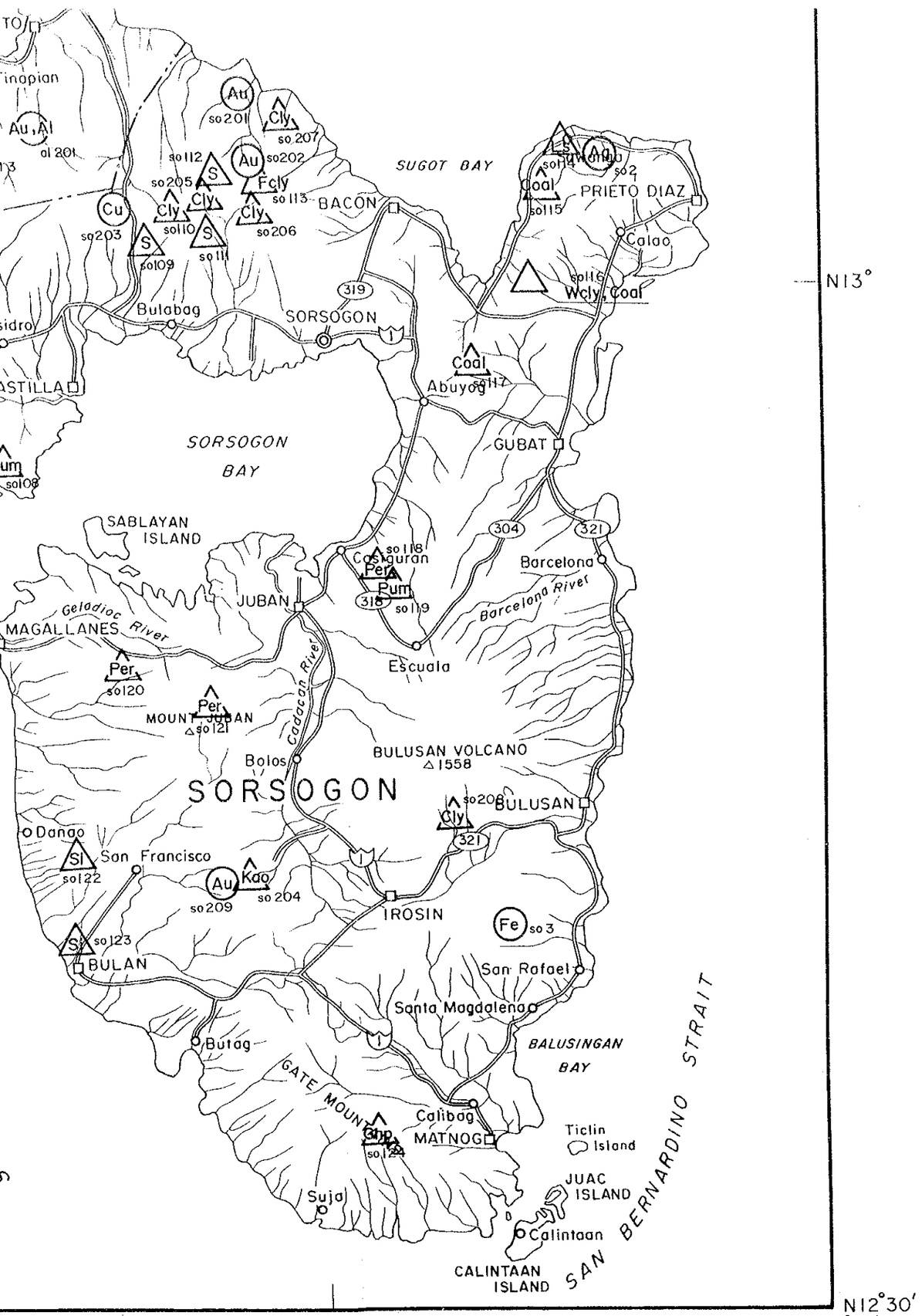
N13°

N12°30'

E123°30'

E124°

E124°15'



Coal	Coal
Dia	Diatomaceous Earth
Fcly	Flint Clay
Fd	Feldsper
Gnp	Guano - Phosphate
Gyp	Gypsum
Kao	Kaoline
Ls	Limestone
Mbl	Marble
Per	Perlite
Pum	Pumice
Py	Pyrite
S	Sulfur
Si	Silica
Wcly	White Clay