

FLOOD HAZARD MAP OF BACACAY QUADRANGLE



MAP LEGEND: Flood Hazard Zones:

- Regularly to frequently flooded areas
- Occasionally to rarely flooded areas
- Non flood prone areas
- Areas prone to riverbank erosion

— contour
— river
— road

EXPLANATIONS:

Flood hazard susceptibility zones were derived based on the geomorphological analysis of landforms and the fluvial system. Information on flood occurrences, flood depths, duration of inundation as well as topographic information supported the geomorphologically-based flood hazard mapping.

Regularly to Frequently Flooded Areas:
Areas that are frequently flooded. Intermittent moderate to heavy rains of 1 to 2 days could bring about flooding in these areas. Moderate to strong typhoons accompanied by heavy rains could submerge these areas 0.5 to 2.0 m in flood water for a few days to a few weeks. Development of urban settlements in these areas is not recommended.

Occasionally to Rarely Flooded Areas:
Areas that become inundated during moderate to strong typhoons accompanied by heavy rains. Flood depths vary from a few centimeters to 1 m. Floods last from a few hours to a few days.

Non Flood Prone Areas:
Areas with no reported flood occurrences except along low lying areas adjoining rivers and creeks but are unmappable in medium scale.

Areas Prone to Riverbank Erosion:
Areas 0 to 50 m from river banks that are prone to scouring and erosion.

Field data collection by: M.R.M. Rint
Geomorphological interpretation by: M.N.L. Miraballes
Digital cartographic processing by: R. Mapalad & M.N.L. Miraballes
GIS processing by: M.N.L. Miraballes
Checked by: A.E. Dayao
Approved by: R.A. Juan

Other sources of information:
1:50,000 NAMRIA Topographic Map
1951 BAW Aerial Photos



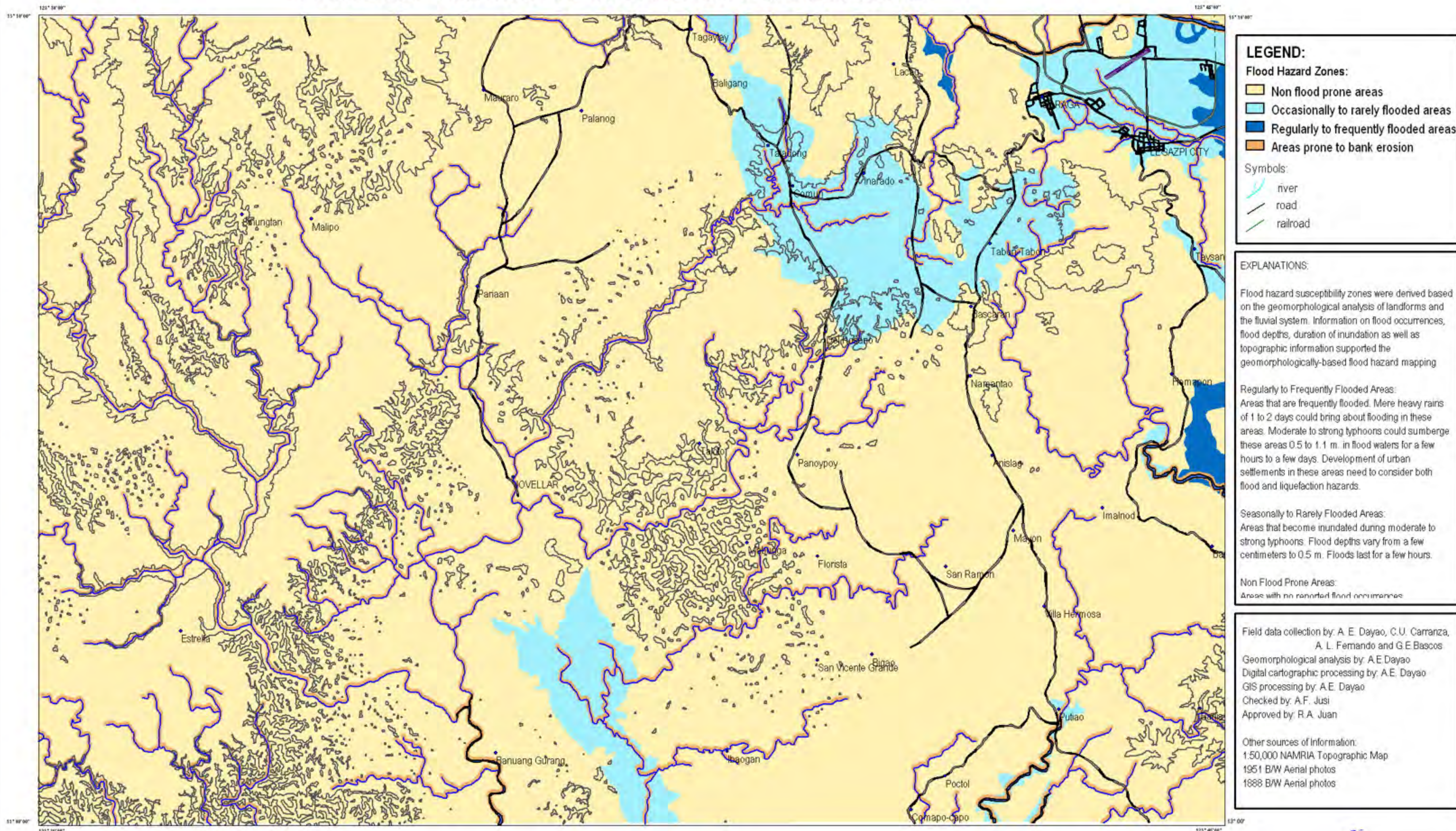
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2009

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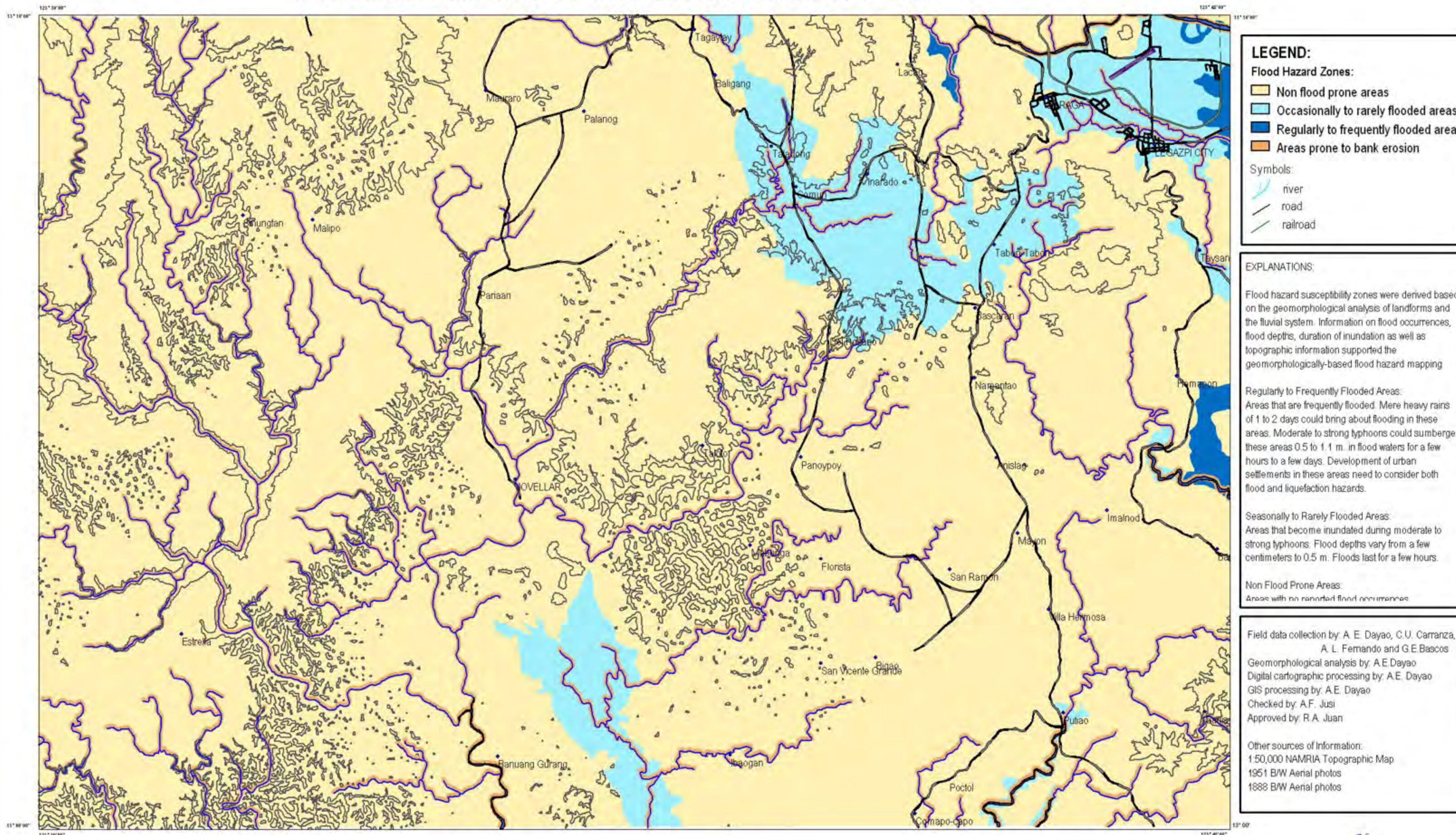
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Clarke 1866, Luzon Datum



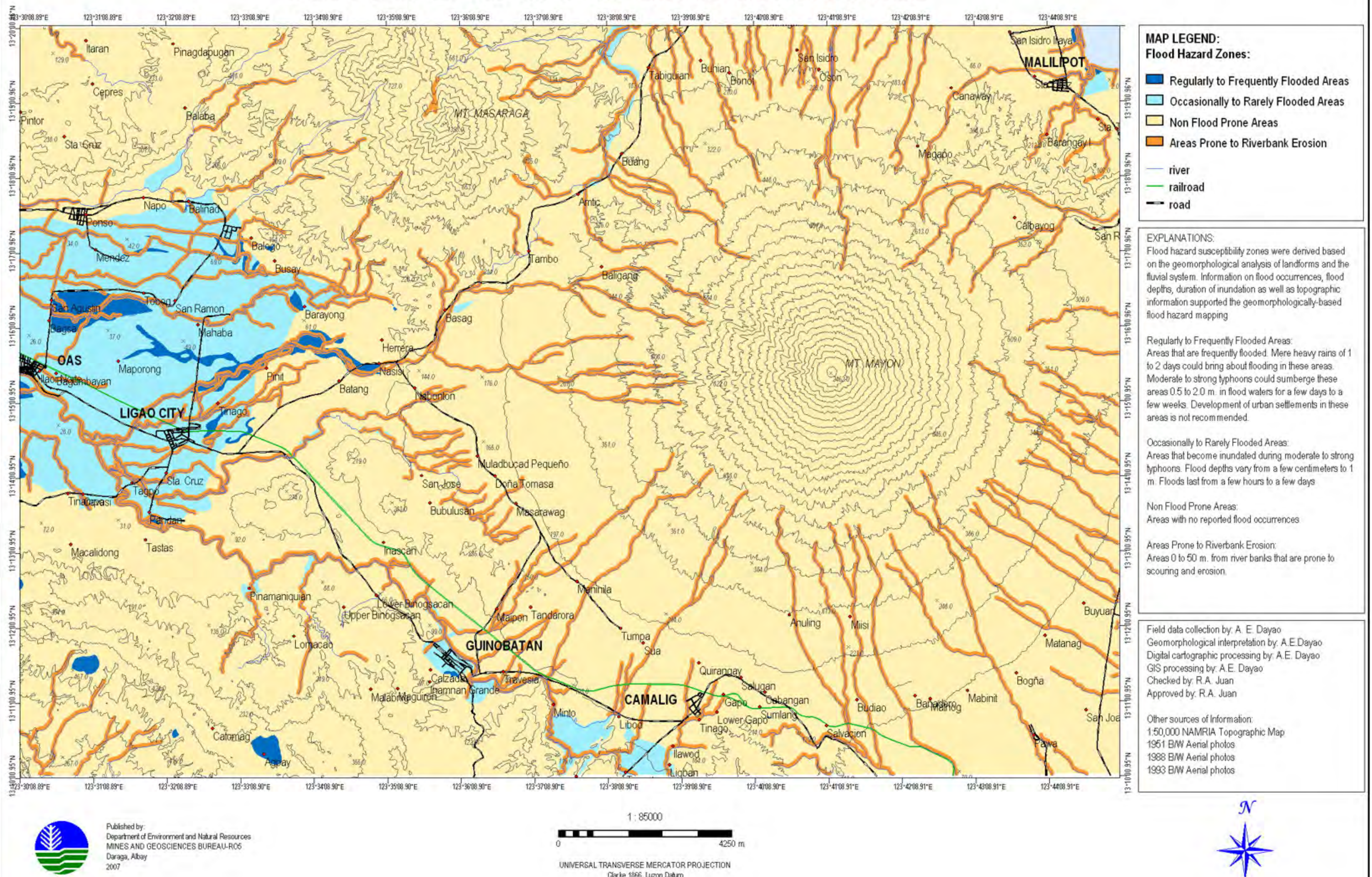
FLOOD HAZARD MAP OF LEGAZPI CITY QUADRANGLE



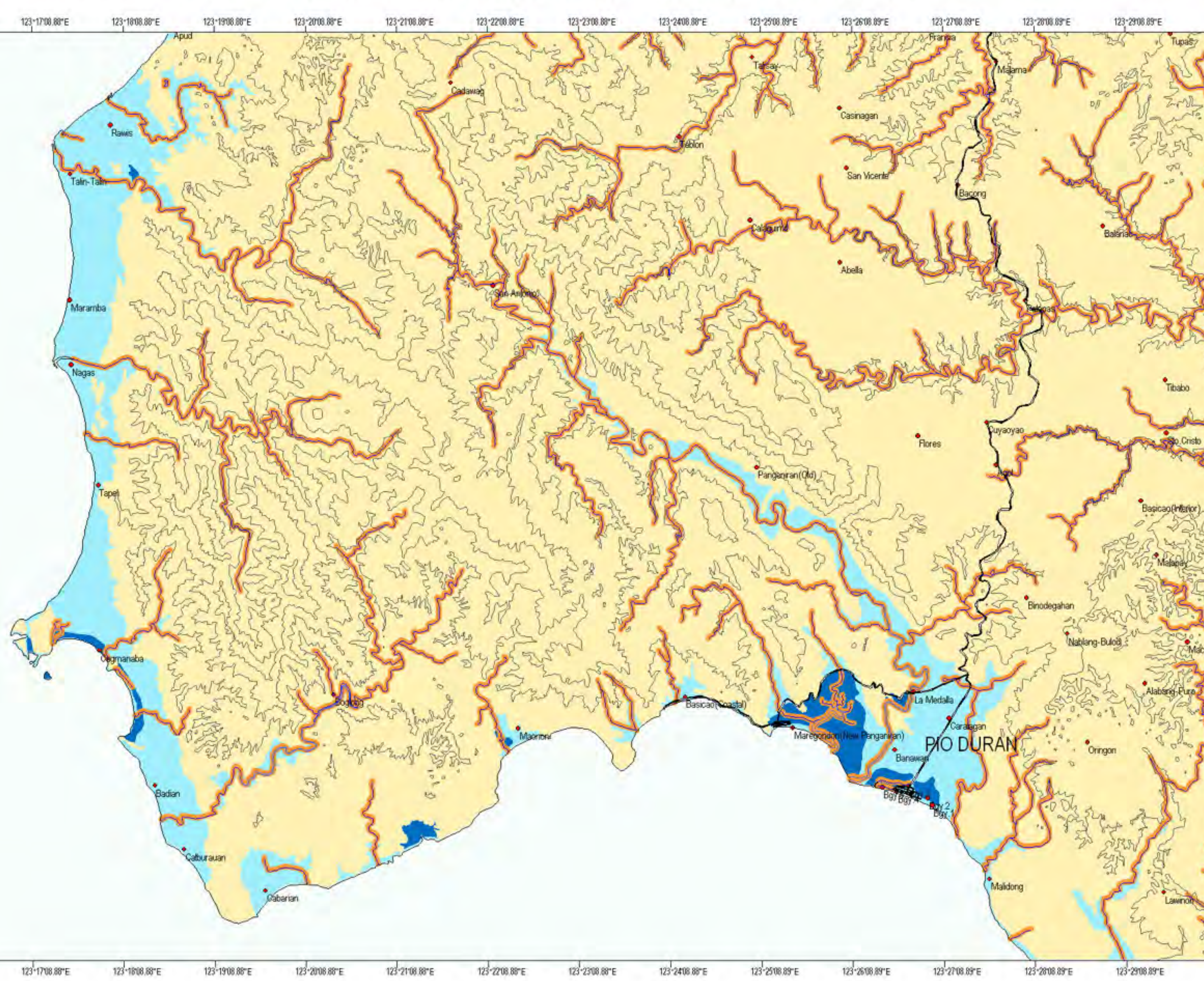
FLOOD HAZARD MAP OF LEGAZPI CITY QUADRANGLE



FLOOD HAZARD MAP OF LIGAO QUADRANGLE



FLOOD HAZARD MAP OF PANGANIRAN QUADRANGLE



MAP LEGEND:

Flood Hazard Zones:

- Non Flood Prone Areas
- Occasionally to Rarely Flooded Areas
- Regularly to Frequently Flooded Areas
- Areas Prone to Bank Erosion
- river
- road

EXPLANATIONS:

Flood hazard susceptibility zones were derived based on the geomorphological analysis of landforms and the fluvial system. Information on flood occurrences, flood depths, duration of inundation as well as topographic information supported the geomorphologically-based flood hazard mapping.

Regularly to Frequently Flooded Areas:
Areas that are frequently flooded. Mere heavy rains of 1 to 2 days could bring about flooding in these areas. Moderate to strong typhoons could submerge these areas 0.5 to 3.0 m. in flood waters for a few days to a few weeks. Housing development in these areas is not recommended.

Occasionally to Rarely Flooded Areas:
Areas that become inundated during moderate to strong typhoons. Flood depths vary from a few centimeters to 1 m. Floods last from a few hours to a few days.

Non Flood Prone Areas:
Areas with no reported flood occurrences except along low lying areas adjoining rivers or creeks.

Areas Prone to Riverbank Erosion:
Areas 0 to 50 m. from river banks that are prone to scouring and erosion.

Field data collection by: E.L. Lagueria & D.D. Velante
Geomorphological interpretation by: A.E. Dayao & E.L. Lagueria
Digital cartographic processing by: A.E. Dayao & E.L. Lagueria
GIS processing by: A.E. Dayao & E.L. Lagueria
Checked by: A.E. Dayao
Approved by: R. A. Juan

Other sources of Information:
1:50,000 NAMRIA Topographic Map
1951 B/W Aerial photos
1988 B/W Aerial photos



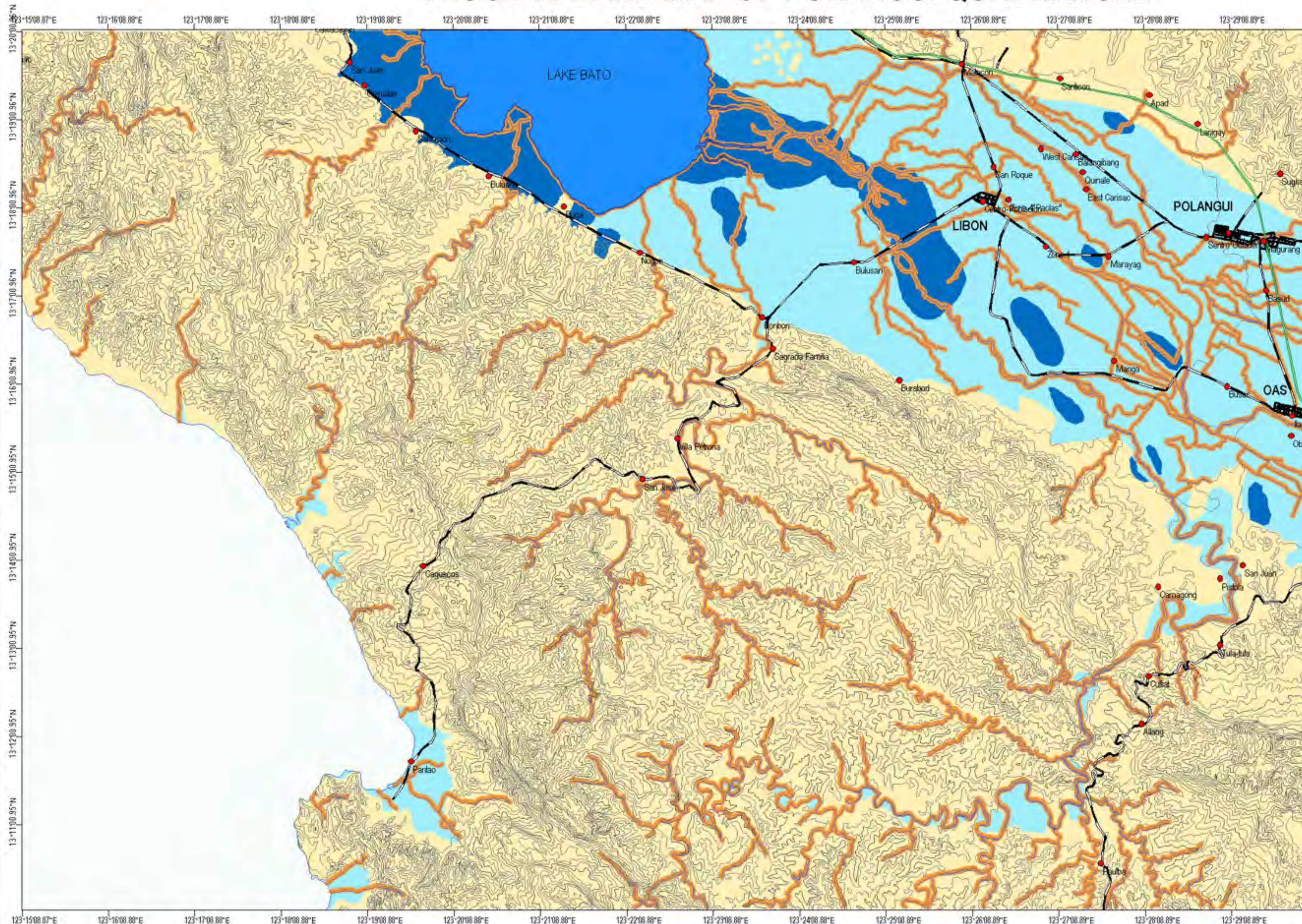
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Daraga, Albay
2007

0 1:85000 4250 m

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Clarke 1866, Luzon Datum



FLOOD HAZARD MAP OF POLANGUI QUADRANGLE



MAP LEGEND: Flood Hazard Zones:

- Regularly to Frequently Flooded Areas
- Occasionally to Rarely Flooded Areas
- Non Flood Prone Areas
- Areas Prone to Bank Erosion
- river
- road

EXPLANATIONS:

Flood hazard susceptibility zones were derived based on the geomorphological analysis of landforms and the fluvial system. Information on flood occurrences, flood depths, duration of inundation as well as topographic information supported the geomorphologically-based flood hazard mapping.

Regularly to Frequently Flooded Areas:
Areas that are frequently flooded. Mere heavy rains of 1 to 2 days could bring about flooding in these areas. Moderate to strong typhoons could submerge these areas 1m to 3 meters or more in flood waters for a few days to a few weeks. Housing development in these areas is not recommended.

Occasionally to Rarely Flooded Areas:
Areas that become inundated during moderate to strong typhoons. Flood depths vary from a few centimeters to 1 m. Floods last from a few hours to a few days.

Non-Flood Prone Areas:
Areas with no reported flood occurrences except low lying areas adjoining rivers or creeks.

Areas Prone to River Bank Erosion:
Areas 0 to 50 m. from river banks of active river channels that are prone to bank erosion.

Field data collection by J.M.S. Laud
Geomorphologic interpretation by J.M.S. Laud
Digital cartographic processing by E.L. Laguerta
GIS processing by J.M.S. Laud
Checked by A.E. Dayao
Approved by R.A. Juan

Other sources of Information:
1:50,000 scale NAMRIA Topographic Map
1951 B/W Aerial Photographs



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Daraga, Albay
2007

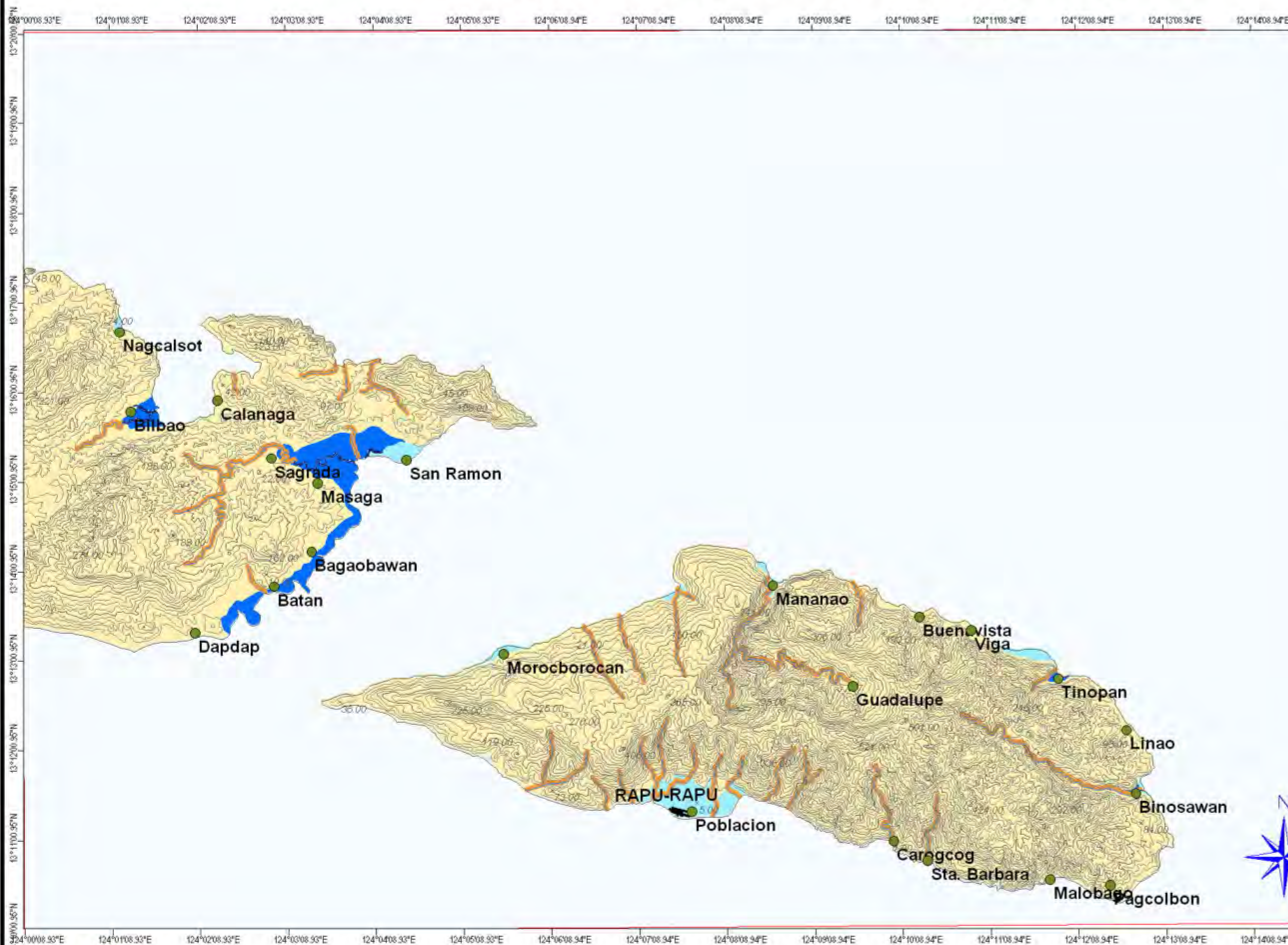


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Universal Transverse Mercator Projection
Clark 1866, Luzon Datum



FLOOD HAZARD MAP OF RAPU-RAPU QUADRANGLE



MAP LEGEND:

Flood Hazard Zones:

- Regularly to frequently flooded areas
- Occasionally to rarely flooded areas
- Non flood prone areas
- Areas prone to riverbank erosion

- river
- road
- contour

EXPLANATIONS

Flood hazard susceptibility zones were derived based on the geomorphological analysis of landforms and the fluvial system. Information on flood occurrences, flood depths, duration of inundation as well as topographic information supported the geomorphologically-based flood hazard mapping.

Regularly to Frequently Flooded Areas:

Areas that are frequently flooded. Mere heavy rains of 1 to 2 days could bring about flooding in these areas. Moderate to strong typhoons could submerge these areas 0.5 to 2.0 m in flood water for a few days to a few weeks. Development of urban settlements in these areas is not recommended.

Occasionally to Rarely Flooded Areas:

Areas that become inundated during moderate to strong typhoons. Flood depths vary from a few centimeters to 1 m. Floods last from a few hours to a few days.

Non Flood Prone Areas:

Areas with no reported flood occurrences except along low lying areas adjoining rivers and creeks.

Areas Prone to Riverbank Erosion:

Areas 0 to 50 m from river banks that are prone to scouring and erosion.

Field data collection by: A.E. Dayao, M.N.L. Miraballes, E.G. Baslan & J.N. Malto

Geomorphological interpretation by: M.N.L. Miraballes

Digital cartographic processing by: R. Mapalad

GIS processing by: M.N.L. Miraballes

Checked by: A.E. Dayao

Approved by: R.A. Juan

Other sources of information:

1:50,000 NAMRIA Topographic Map

1951 B/W Aerial Photos



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MINES AND GEOSCIENCES BUREAU RO-5
Rawis, Legazpi City
2008

0 4250 m

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Clarke 1866, Luzon Datum



FLOOD HAZARD MAP OF SAN MIGUEL QUADRANGLE



MAP LEGEND:

Flood Hazard Zones:

- Regularly to frequently flooded areas
- Occasionally to rarely flooded areas
- Non flood prone areas
- Areas prone to riverbank erosion

- contour
- river
- road



EXPLANATIONS

Flood hazard susceptibility zones were derived based on the geomorphological analysis of landforms and the fluvial system. Information on flood occurrences, flood depths, duration of inundation as well as topographic information supported the geomorphologically-based flood hazard mapping.

Regularly to Frequently Flooded Areas:
Areas that are frequently flooded. Intermittent moderate to heavy rains of 1 to 2 days could bring about flooding in these areas. Moderate to strong typhoons accompanied by heavy rains could submerge these areas 0.5 to 2.0 m in flood water for a few days to a few weeks. Development of urban settlements in these areas is not recommended.

Occasionally to Rarely Flooded Areas:
Areas that become inundated during moderate to strong typhoons accompanied by heavy rains. Flood depths vary from a few centimeters to 1 m. Floods last from a few hours to a few days.

Non Flood Prone Areas:
Areas with no reported flood occurrences except along low lying areas adjoining rivers and creeks but are unmappable in medium scale.

Areas Prone to Riverbank Erosion:
Areas 0 to 50 m from river banks that are prone to scouring and erosion.

Field data collection by: M.R.M. Rint
Geomorphological interpretation by: M.N.L. Miraballes
Digital cartographic processing by: R. Mapalad & M.N.L. Miraballes
GIS processing by: M.N.L. Miraballes
Checked by: A.E. Dayao
Approved by: R.A. Juan

Other sources of information:
1:50,000 NAMRIA Topographic Map
1951 B/W Aerial Photos

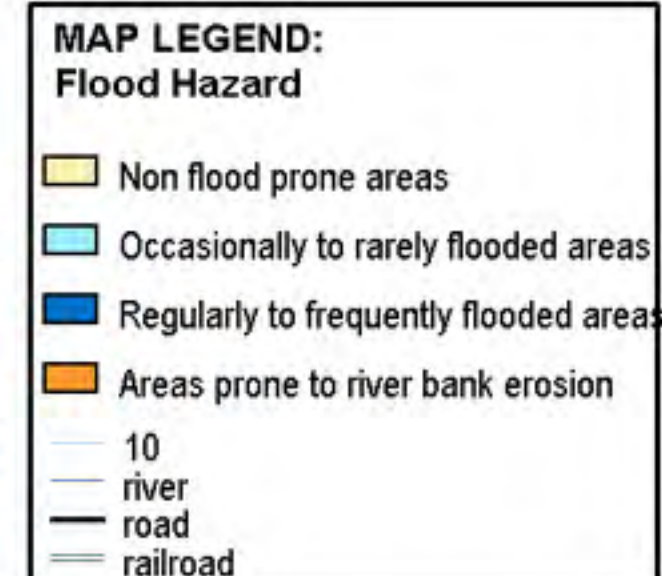
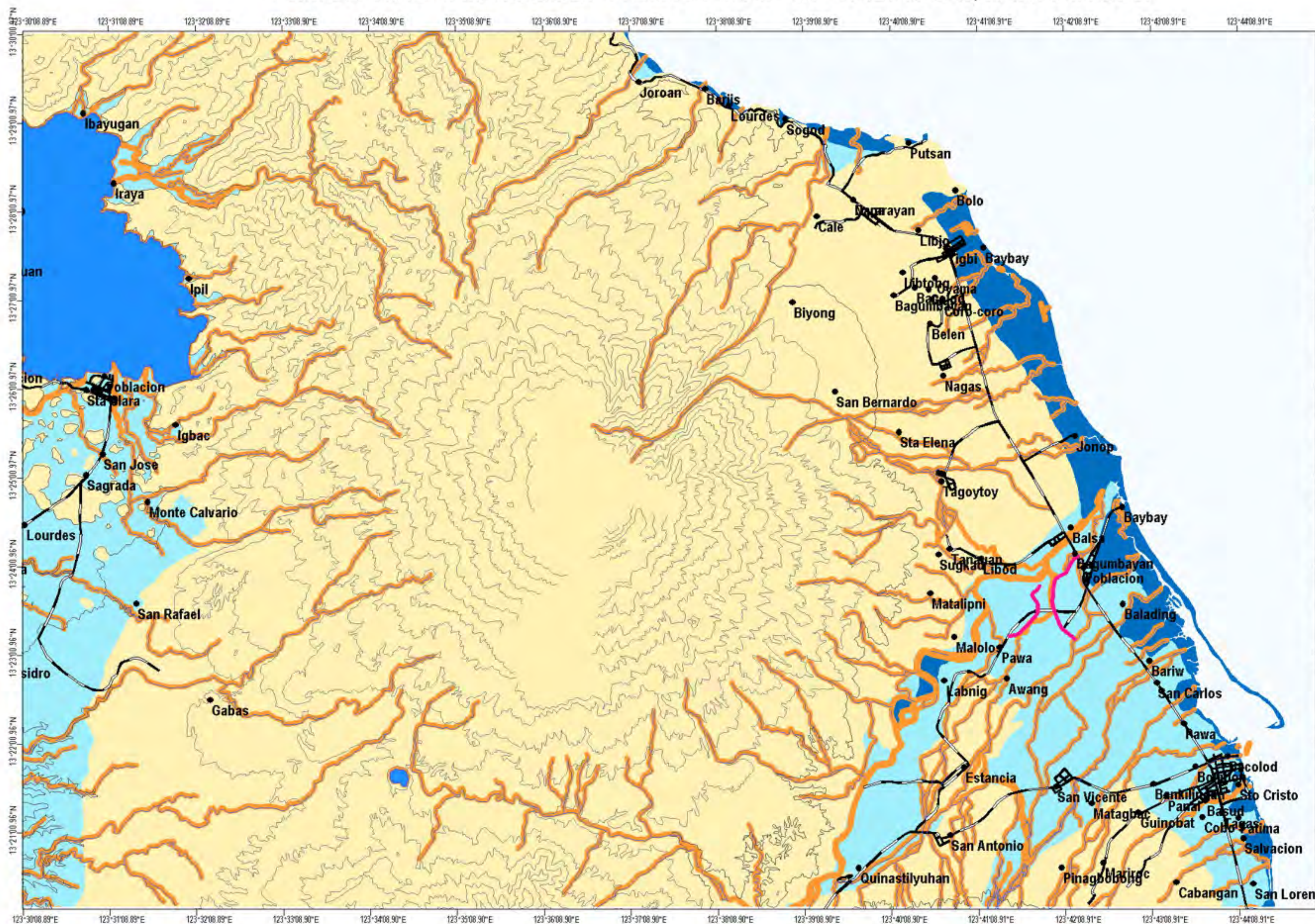


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Rawis, Legazpi City
2009



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FLOOD HAZARD SUSCEPTIBILITY MAP OF TABACO QUADRANGLE



EXPLANATIONS:

Flood hazard susceptibility were derived based on the geomorphological analysis of landforms and the fluvial system. Information on flood occurrences, flood depths, duration of inundation as well as topographic information supported the geomorphologically-based flood hazard mapping.

Regularly to Frequently Flooded Areas:
Areas that are frequently flooded. Mere heavy rains of 1 to 2 days could bring about flooding in these areas. Moderate to strong typhoons could submerge these areas from 0.2 to 2 m. in flood waters for a few hours to a few days. Development of urban settlements in these areas need to consider both flood and liquefaction hazards.

Occasionally to Rarely Flooded Areas:
Areas that become inundated during moderate to strong typhoons. Flood depths varies from a few centimeters to 1 meter. Floods last from a few hours to a few days.

Non Flood Prone Areas:
Areas with no reported flood occurrences except along low lying areas adjoining rivers and creeks.

Field data collection by: Jose Marcel S. Laud
Geomorphological interpretation by: Jose Marcel S. Laud
Digital cartographic processing by: Rosalyn L. Mapalad
GIS processing by: Jose Marcel S. Laud
Checked by: Arlene E. Dayao
Approved by: Reynulfo A. Juan

Other sources of information:
1:50,000 NAMRIA Topographic Map
1951 B/W Aerial photos
1988 B/W Aerial photos



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2009

0 1 : 85000 5000

Universal Transverse Mercator Projection
Clarke 1866, Luzon Datum



GROUND SETTLEMENT AND GROUND SUBSIDENCE SUSCEPTIBILITY MAP OF BACACAY QUADRANGLE

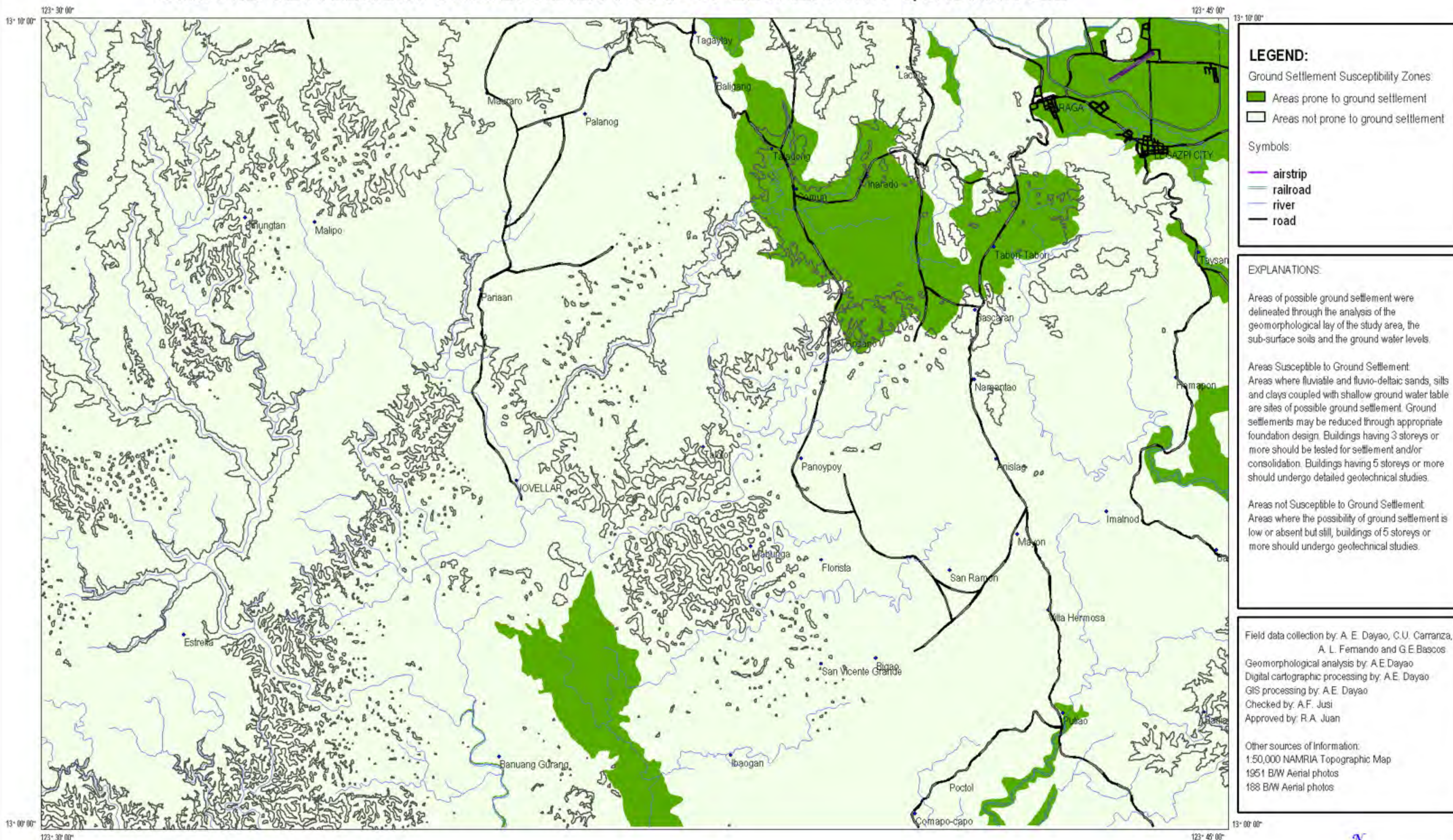


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 Rawis, Legazpi City
 2009

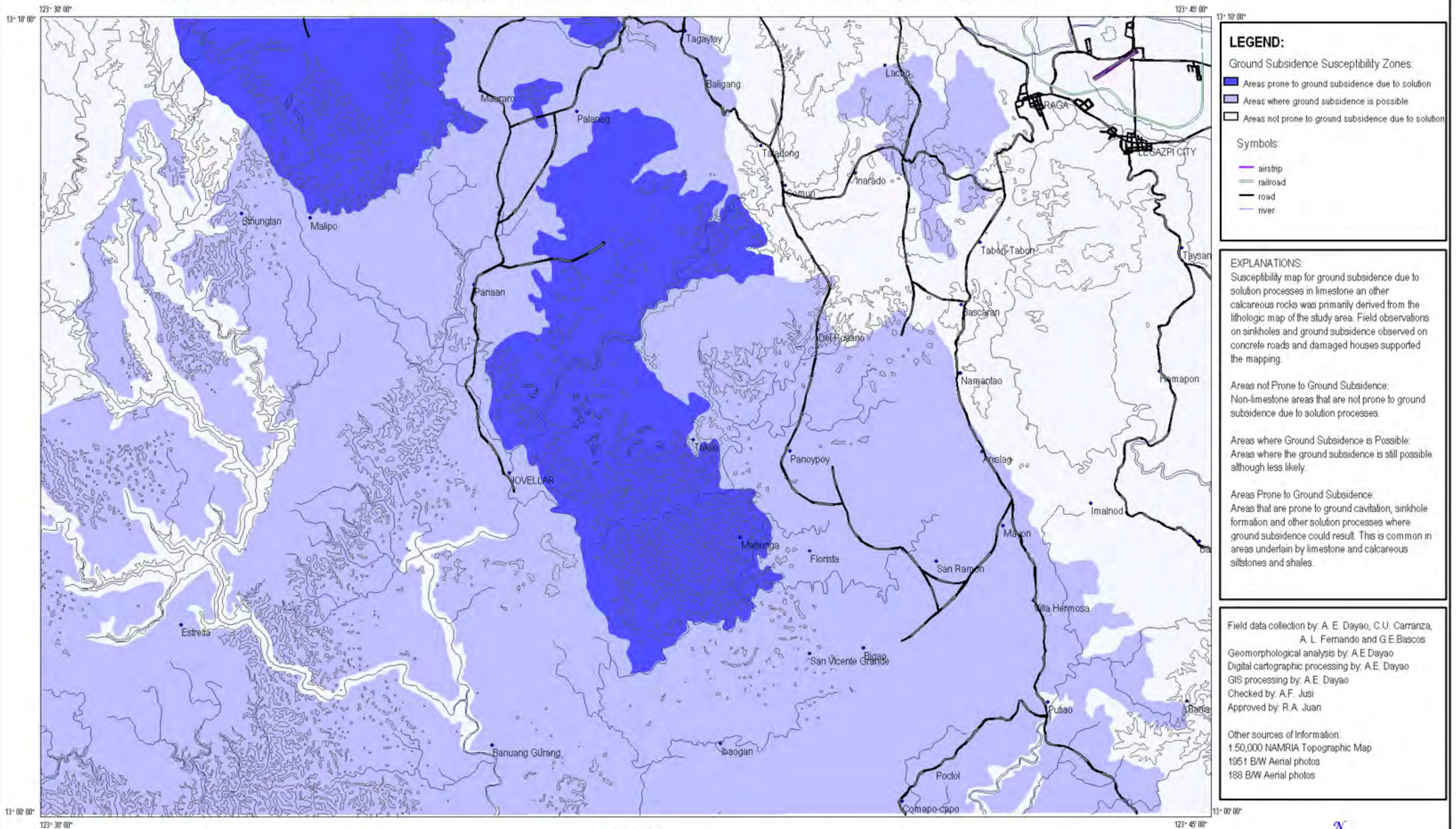
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 Clarke 1866, Luzon Datum

GROUND SETTLEMENT SUSCEPTIBILITY MAP OF LEGAZPI CITY QUADRANGLE



GROUND SUBSIDENCE SUSCEPTIBILITY MAP OF LEGAZPI CITY QUADRANGLE



LEGEND:

Ground Subsidence Susceptibility Zones:

- Areas prone to ground subsidence due to solution
- Areas where ground subsidence is possible
- Areas not prone to ground subsidence due to solution

Symbols:

- airstrip
- railroad
- road
- river

EXPLANATIONS:

Susceptibility map for ground subsidence due to solution processes in limestone and other calcareous rocks was primarily derived from the lithologic map of the study area. Field observations on sinkholes and ground subsidence observed on concrete roads and damaged houses supported the mapping.

Areas not Prone to Ground Subsidence:
Non-limestone areas that are not prone to ground subsidence due to solution processes.

Areas where Ground Subsidence is Possible:
Areas where the ground subsidence is still possible although less likely.

Areas Prone to Ground Subsidence:
Areas that are prone to ground cavitation, sinkhole formation and other solution processes where ground subsidence could result. This is common in areas underlain by limestone and calcareous siltstones and shales.

Field data collection by: A. E. Dayao, C.U. Carranza, A. L. Fernando and G.E. Bascos

Geomorphological analysis by: A.E. Dayao

Digital cartographic processing by: A.E. Dayao

GIS processing by: A.E. Dayao

Checked by: A.F. Jusi

Approved by: R.A. Juan

Other sources of Information:

1:50,000 NAMRIA Topographic Map

1951 B/W Aerial photos

188 B/W Aerial photos

SCALE 1:85,000



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Clarke 1866, Luzon Datum

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MINES AND GEOSCIENCES BUREAU-RO6
Davao, Albay
2004



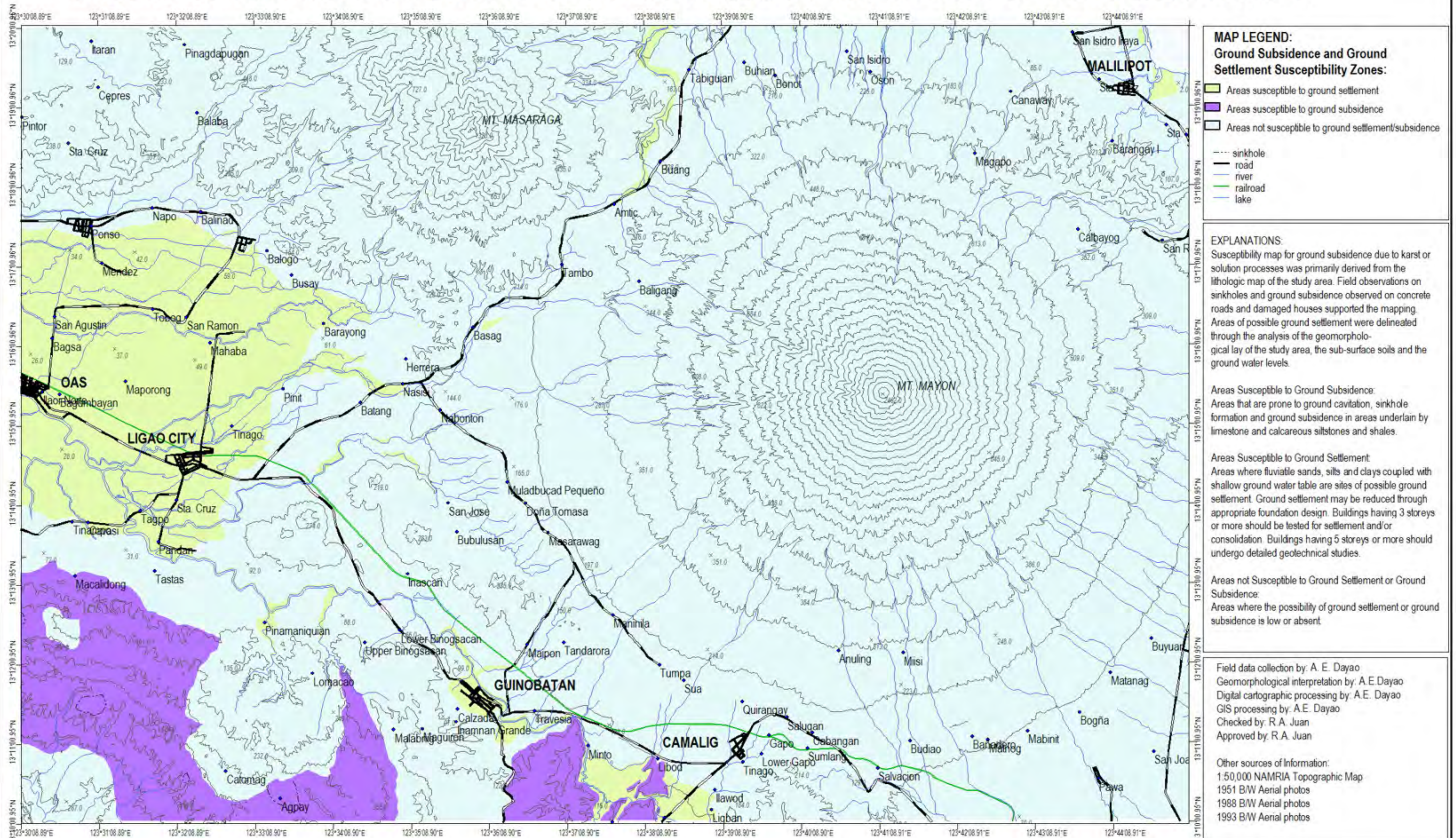
UNITED NATIONS DEVELOPMENT PROGRAMME
ENR SHELL PROGRAMME
Development of Mitigation Scheme for Geological
Hazards Project



Department of Environment
and Natural Resources



GROUND SUBSIDENCE AND GROUND SETTLEMENT SUSCEPTIBILITY MAP OF LIGAO QUADRANGLE

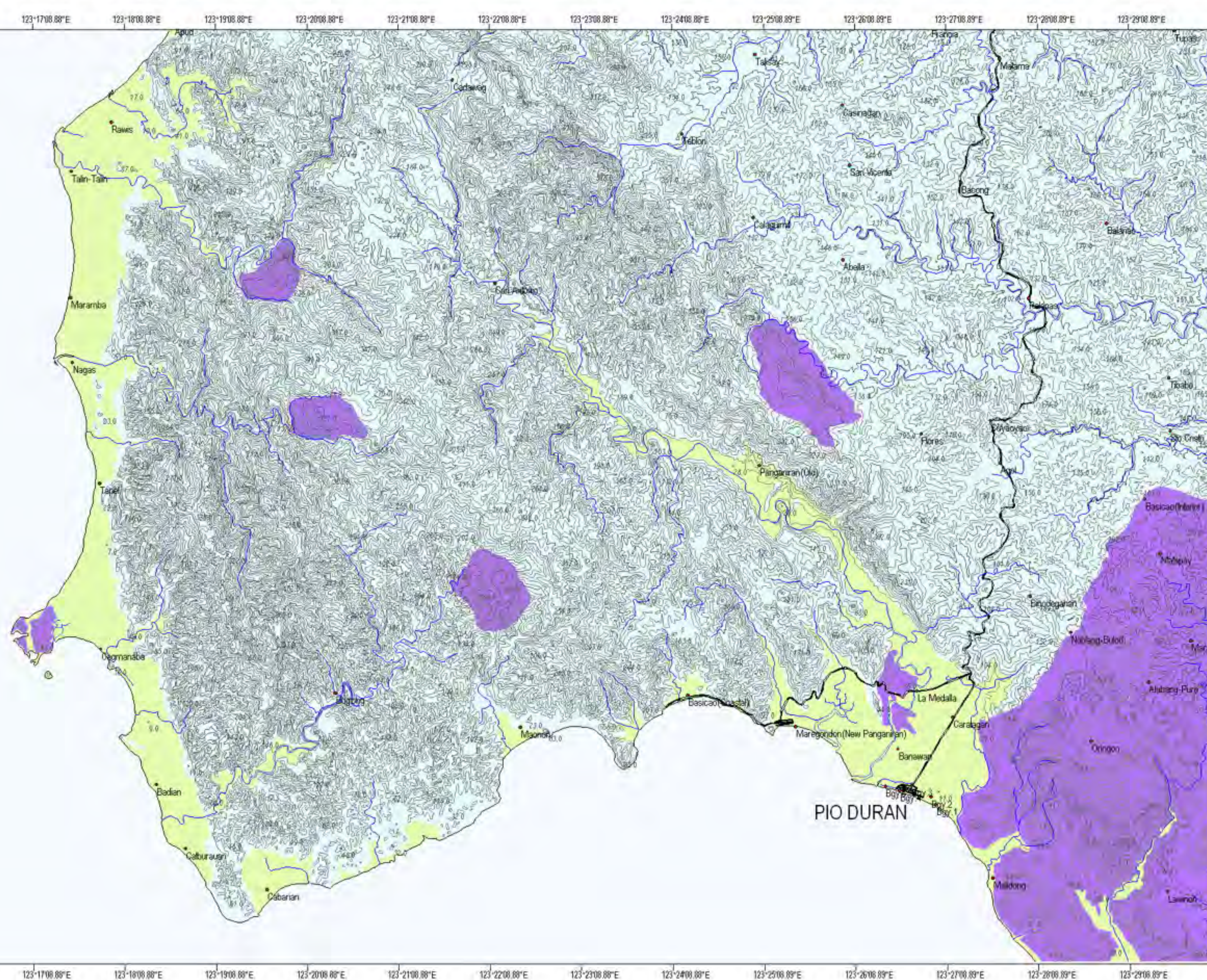


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 Daraga, Albay
 2007

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 Clarke 1866, Luzon Datum



GROUND SUBSIDENCE AND GROUND SETTLEMENT SUSCEPTIBILITY MAP OF PANGANIRAN QUADRANGLE



MAP LEGEND: Ground Subsidence and Ground Settlement Susceptibility Zones:

- Areas Susceptible to Ground Settlement
- Areas Susceptible to Ground Subsidence
- Areas not Susceptible to Ground Settlement/Subsidence
- river
- road

EXPLANATIONS:

Susceptibility map for ground subsidence due to karst or solution processes was primarily derived from the lithologic map of the study area. Field observations on sinkholes, ground subsidence observed on concrete roads and damaged houses supported the mapping. Areas of possible ground settlement were delineated through the analysis of the geomorphological lay of the study area, the sub-surface soils and the groundwater levels.

Areas Susceptible to Ground Subsidence:
Areas that are prone to ground cavitation, sinkhole formation and ground subsidence in areas underlain by limestone, marl and calcareous siltstones and shales

Areas Susceptible to Ground Settlement
Areas where fluvial and marine sands, silts and clays coupled with shallow groundwater table are sites of possible ground settlement. Ground settlement may be reduced through appropriate foundation design. Buildings having 3 storeys or more should be tested for settlement and/or consolidation. Buildings having 5 storeys or more should undergo detailed geotechnical studies.

Areas not Susceptible to Ground Settlement or Ground Subsidence:
Areas where the possibility of ground settlement or ground subsidence is low or absent

Field data collection by: E.L. Lagueria & D.D. Velante
Geomorphological interpretation by: A.E. Dayao & E.L. Lagueria
Digital cartographic processing by: A.E. Dayao & E.L. Lagueria
GIS processing by: A.E. Dayao & E.L. Lagueria
Checked by: A.E. Dayao
Approved by: R. A. Juan

Other sources of Information:
1:50,000 NAMRIA Topographic Map
1951 B/W Aerial photos
1988 B/W Aerial photos



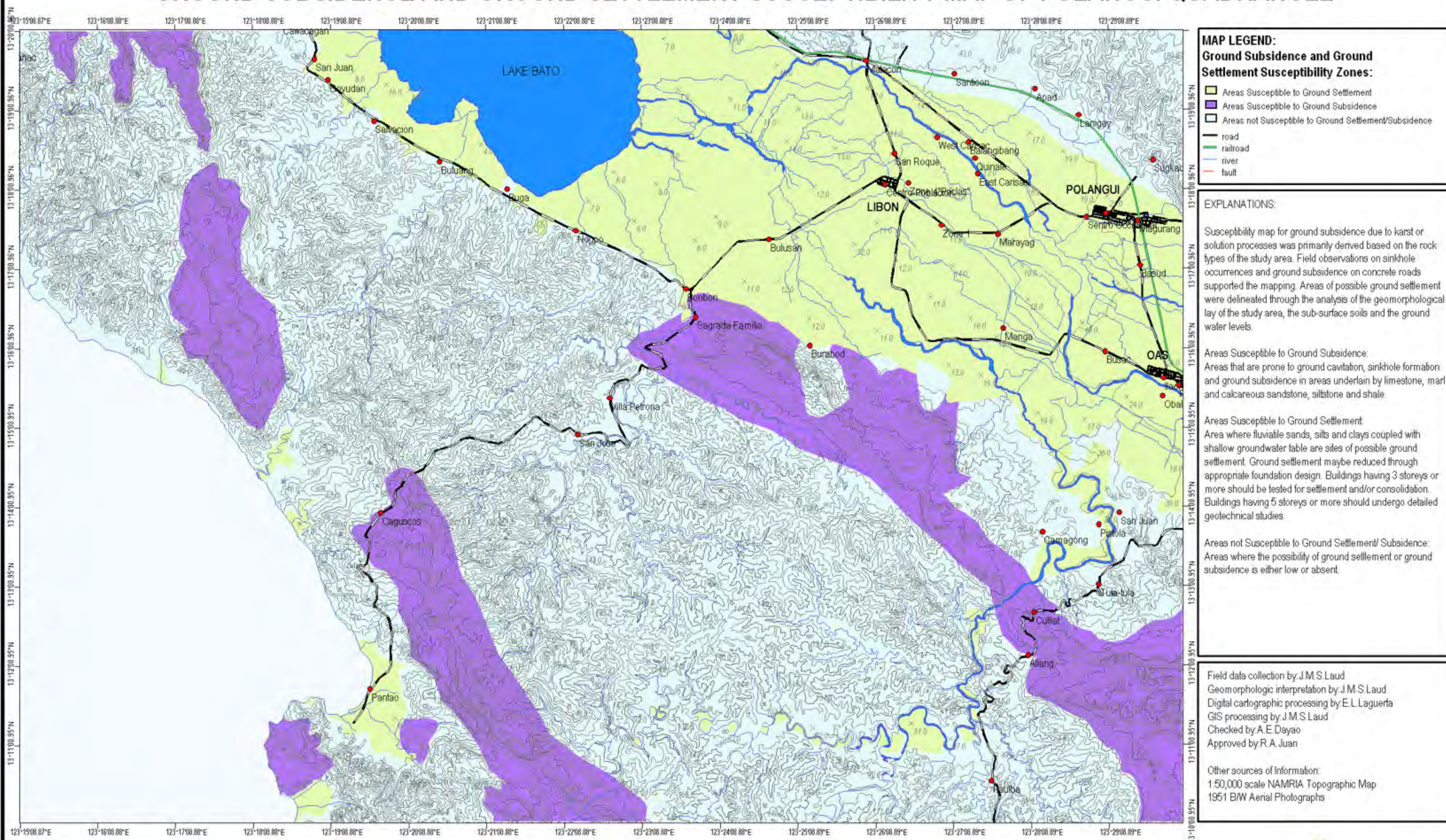
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Davao, Albay
2007

0 1 : 85000 4250 m

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GROUND SUBSIDENCE AND GROUND SETTLEMENT SUSCEPTIBILITY MAP OF POLANGUI QUADRANGLE



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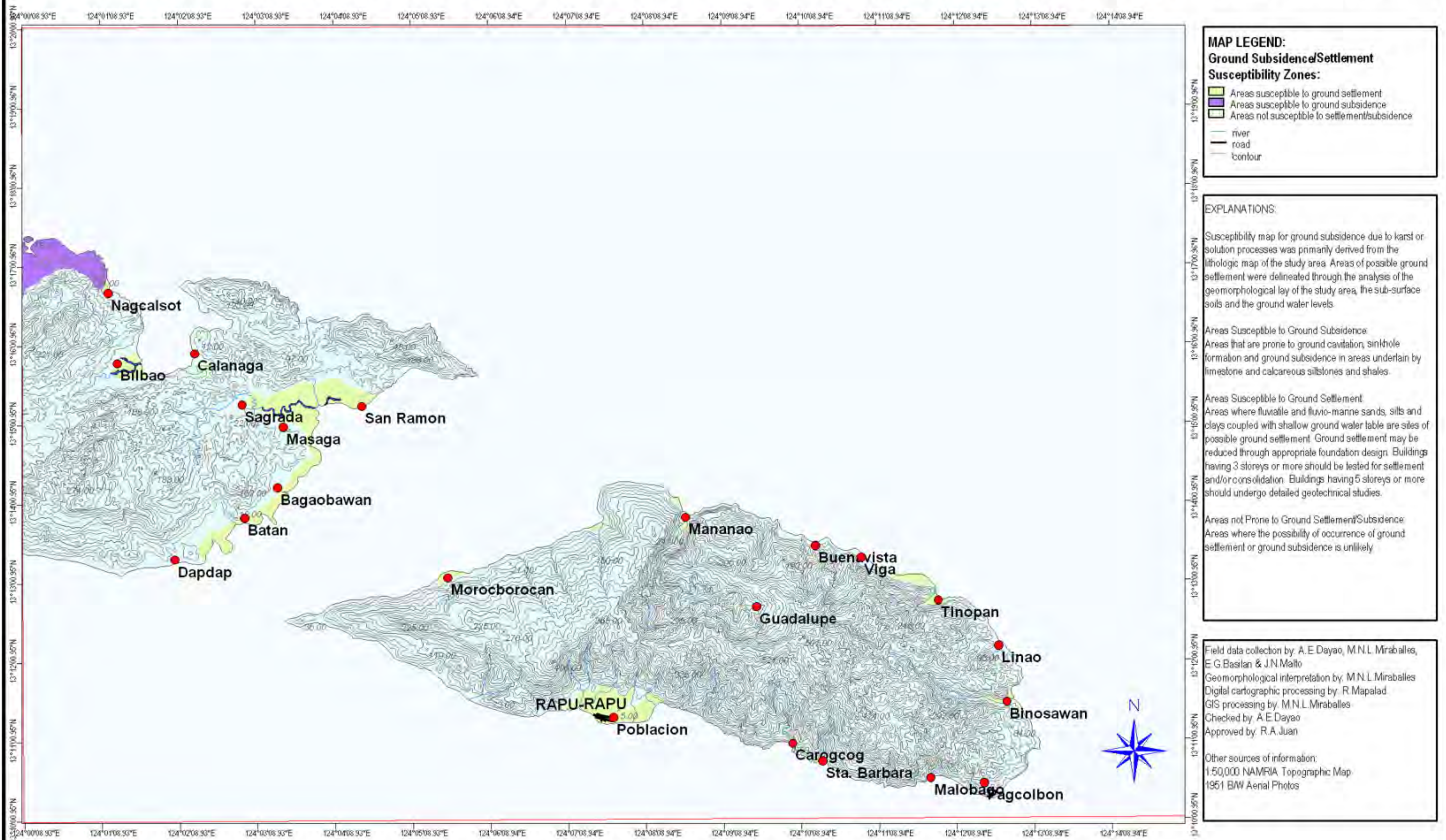
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Universal Transverse Mercator Projection
 Clark 1866, Luzon Datum



GROUND SUBSIDENCE AND GROUND SETTLEMENT SUSCEPTIBILITY MAP OF RAPU-RAPU QUADRANGLE



MAP LEGEND:

Ground Subsidence/Settlement Susceptibility Zones:

- Areas susceptible to ground settlement
- Areas susceptible to ground subsidence
- Areas not susceptible to settlements/subsidence
- river
- road
- contour

EXPLANATIONS:

Susceptibility map for ground subsidence due to karst or solution processes was primarily derived from the lithologic map of the study area. Areas of possible ground settlement were delineated through the analysis of the geomorphological lay of the study area, the sub-surface soils and the ground water levels.

Areas Susceptible to Ground Subsidence:

Areas that are prone to ground cavitation, sinkhole formation and ground subsidence in areas underlain by limestone and calcareous siltstones and shales.

Areas Susceptible to Ground Settlement:

Areas where fluvial and fluvio-marine sands, silts and clays coupled with shallow ground water table are sites of possible ground settlement. Ground settlement may be reduced through appropriate foundation design. Buildings having 3 storeys or more should be tested for settlement and/or consolidation. Buildings having 5 storeys or more should undergo detailed geotechnical studies.

Areas not Prone to Ground Settlement/Subsidence:

Areas where the possibility of occurrence of ground settlement or ground subsidence is unlikely.

Field data collection by: A.E. Dayao, M.N.L. Miraballes, E.G. Basitan & J.N. Mallo
 Geomorphological interpretation by: M.N.L. Miraballes
 Digital cartographic processing by: R. Mapalad
 GIS processing by: M.N.L. Miraballes
 Checked by: A.E. Dayao
 Approved by: R.A. Juan

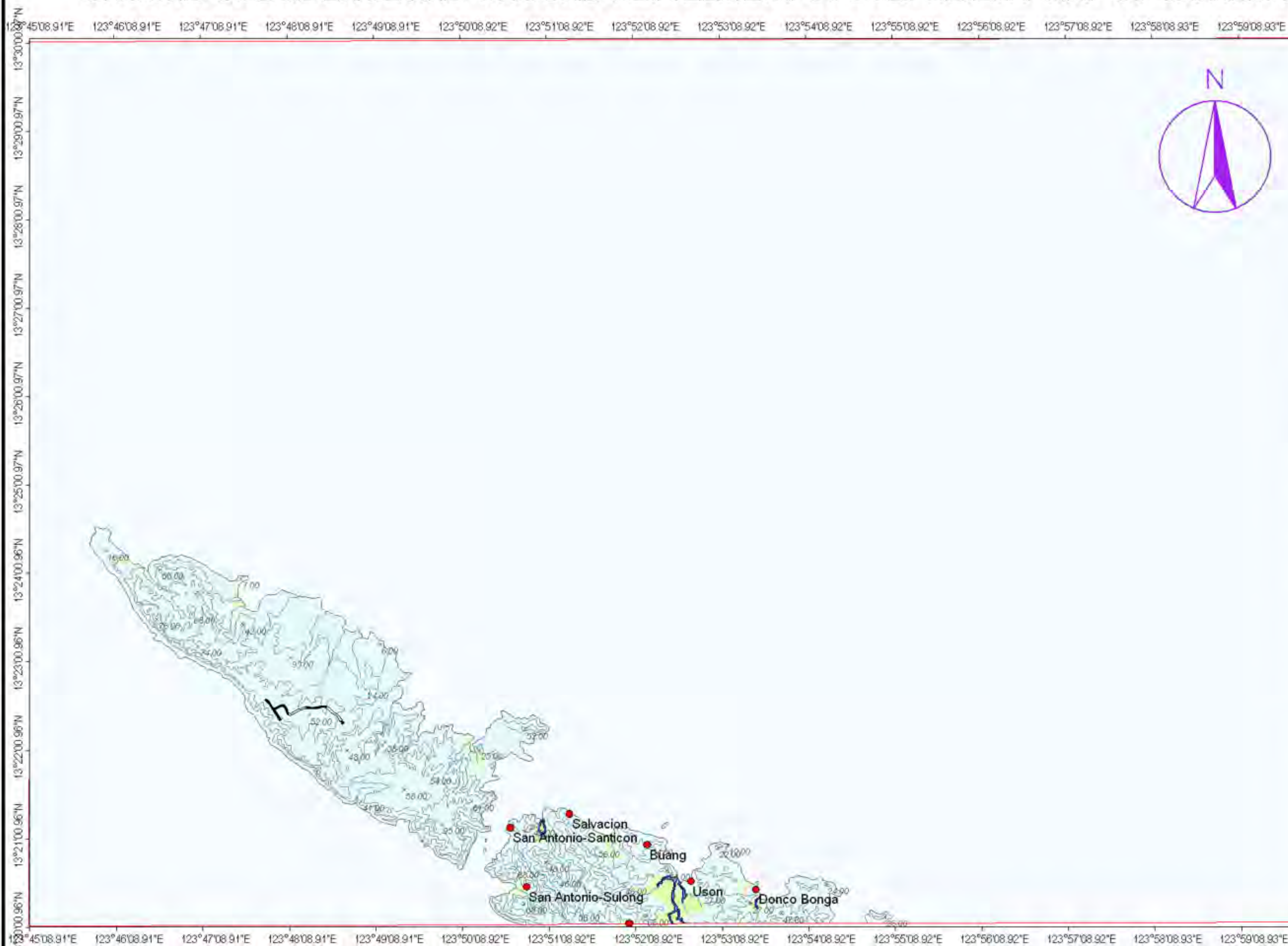
Other sources of information:
 1:50,000 NAMRIA Topographic Map
 1951 B/W Aerial Photos



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 MINES AND GEOSCIENCES BUREAU RO-5
 Rawis, Legazpi City
 2008

0 4250 m
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 Clarke 1866, Luzon Datum

GROUND SUBSIDENCE AND GROUND SETTLEMENT SUSCEPTIBILITY MAP OF SAN MIGUEL QUADRANGLE



MAP LEGEND:

Ground Subsidence and Settlement Susceptibility Zones:

- Areas susceptible to ground settlement
- Areas not susceptible to settlement/subsidence
- contour
- river
- road

EXPLANATIONS:

Susceptibility map for ground subsidence due to karst or solution processes was primarily derived from the lithologic map of the study area. Areas of possible ground settlement were delineated through the analysis of the geomorphological lay of the study area, the sub-surface soils and the ground water levels.

Areas Susceptible to Ground Settlement:
Areas where fluvial and fluvo-marine sands, silts and clays coupled with shallow ground water table are sites of possible ground settlement. Ground settlement may be reduced through appropriate foundation design. Buildings having 3 storeys or more should be tested for settlement and/or consolidation. Buildings having 5 storeys or more should undergo detailed geotechnical studies.

Areas Susceptible to Ground Subsidence:
Areas that are underlain by limestone, calcarenites and calcareous siltstones and shales are prone to ground cavitation, sinkhole formation and ground subsidence.

Areas not Prone to Ground Settlement/Subsidence:
Areas where the possibility of occurrence of ground settlement or ground subsidence is unlikely

Field data collection by: M.R.M. Rint
Geomorphological interpretation by: M.N.L. Miraballes
Digital cartographic processing by: R. Mapalad & M.N.L. Miraballes
GIS processing by: M.N.L. Miraballes
Checked by: A.E. Dayao
Approved by: R.A. Juan

Other sources of information:
1:50,000 NAMRIA Topographic Map
1951 B/W Aerial Photos

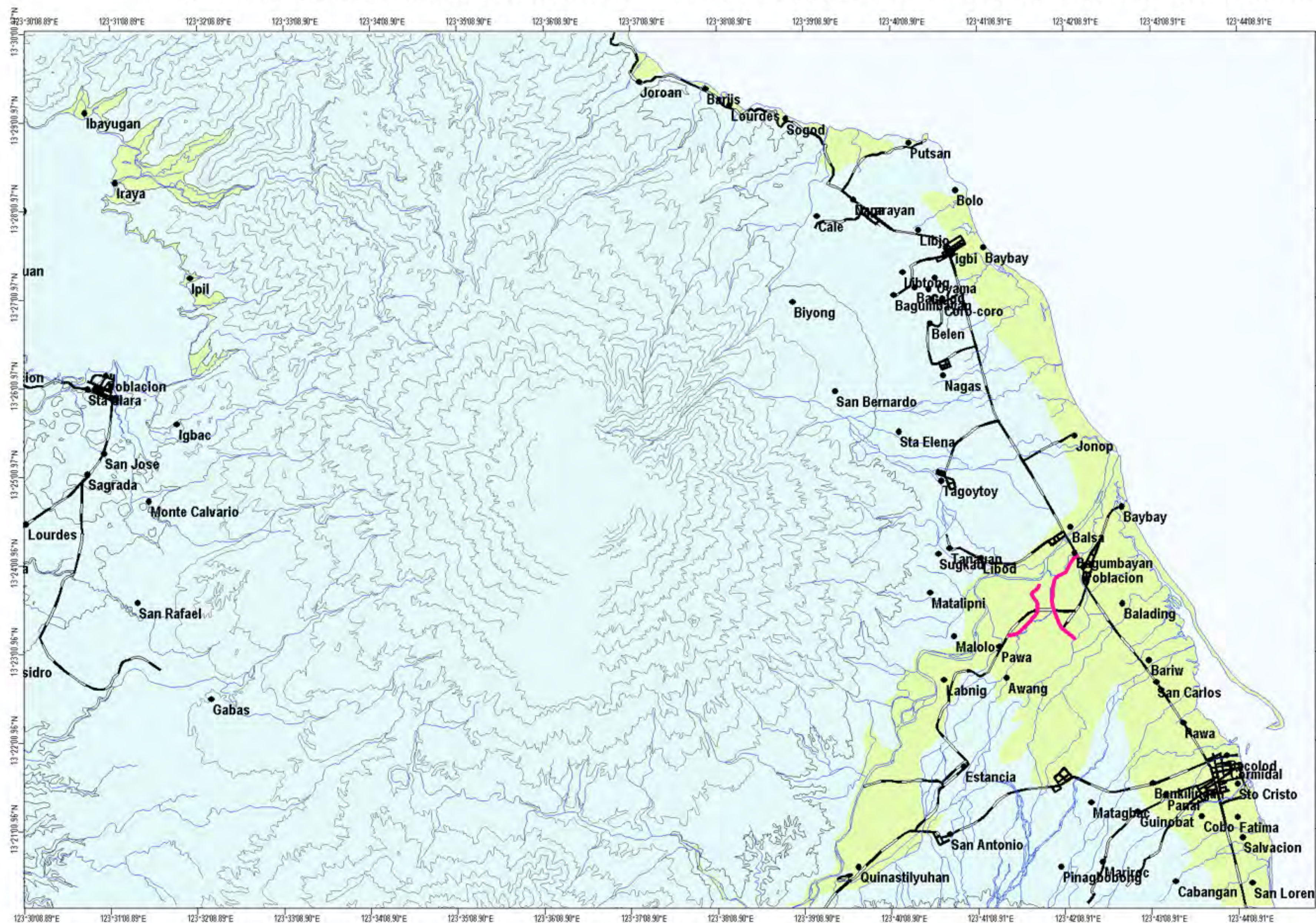


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Rawis, Legazpi City
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GROUND SUBSIDENCE AND GROUND SETTLEMENT SUSCEPTIBILITY MAP OF TABACO QUADRANGLE



MAP LEGEND:
Ground Subsidence and Ground Settlement Susceptibility

- Areas susceptible to ground subsidence
- Areas susceptible to ground settlement
- Areas not susceptible to ground subsidence/settlement

— 10
 — river
 — road
 — railroad

EXPLANATIONS:

The areas within the Tabaco Quadrangle is not susceptible to ground subsidence because it has no limestone or karst areas. Areas of possible ground settlement were delineated through the analysis of the geomorphological lay of the study area, the subsurface soils and the ground water levels.

Areas Susceptible to Ground Subsidence:
 Areas that are prone to ground cavitation, sinkhole formation and ground subsidence in areas underlain by limestone and calcareous siltstones and shales.

Areas Susceptible to Ground Settlement:
 Areas where fluvial and fluvio-marine sands, silts and clays coupled with shallow ground water table are sites of possible ground settlement. Ground settlement may be reduced through appropriate foundation design. Buildings having 3 storeys or more should be tested for settlement and/or consolidation. Buildings having 5 storeys or more should undergo geotechnical studies.

Areas Not Prone to Ground Settlement/ Subsidence:

Field data collection by: Jose Marcel S. Laud
 Geomorphological interpretation by: Jose Marcel S. Laud
 Digital cartographic processing by: Rosalyn L. Mapalad
 GIS processing by: Jose Marcel S. Laud
 Checked by: Arlene E. Dayao
 Approved by: Reynulfo A. Juan

Other sources of information:
 1:50,000 NAMRIA Topographic Map
 1951 B/W Aerial photos
 1988 B/W Aerial photos



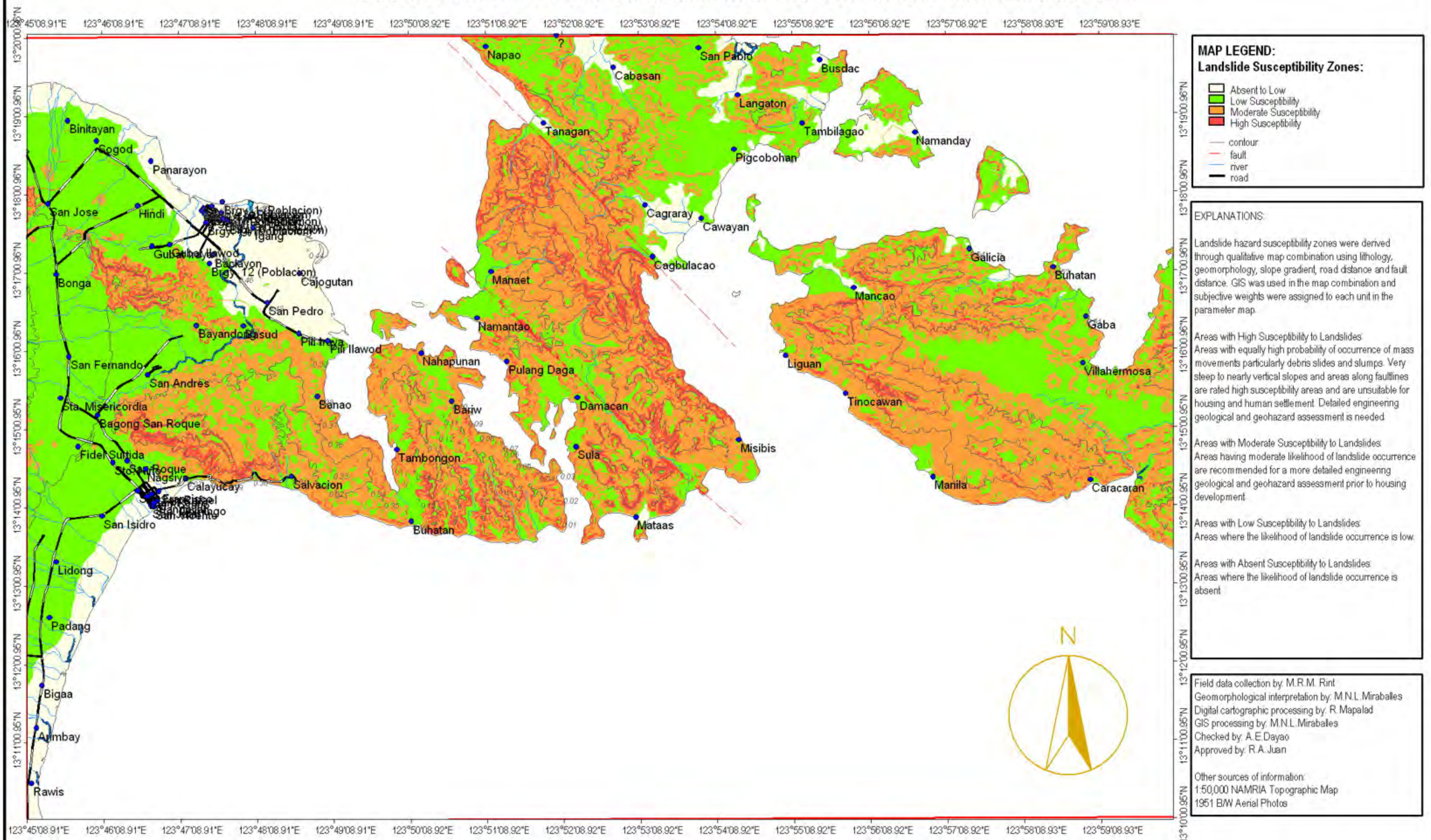
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 Rawis, Legaspi City
 2009

0 1 : 85000 5000

Universal Transverse Mercator Projection
 Clarke 1866, Luzon Datum



LANDSLIDE SUSCEPTIBILITY MAP OF BACACAY QUADRANGLE

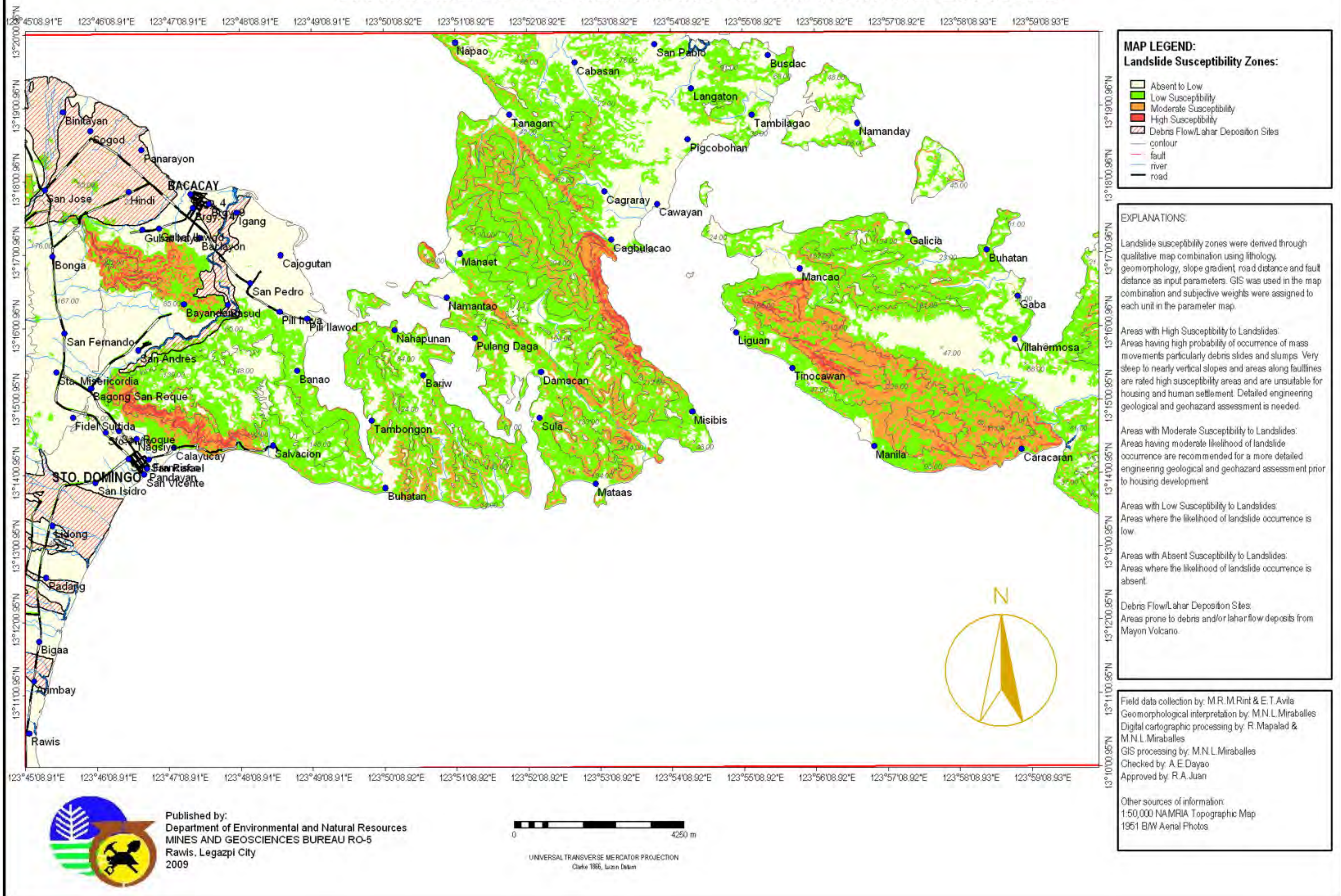


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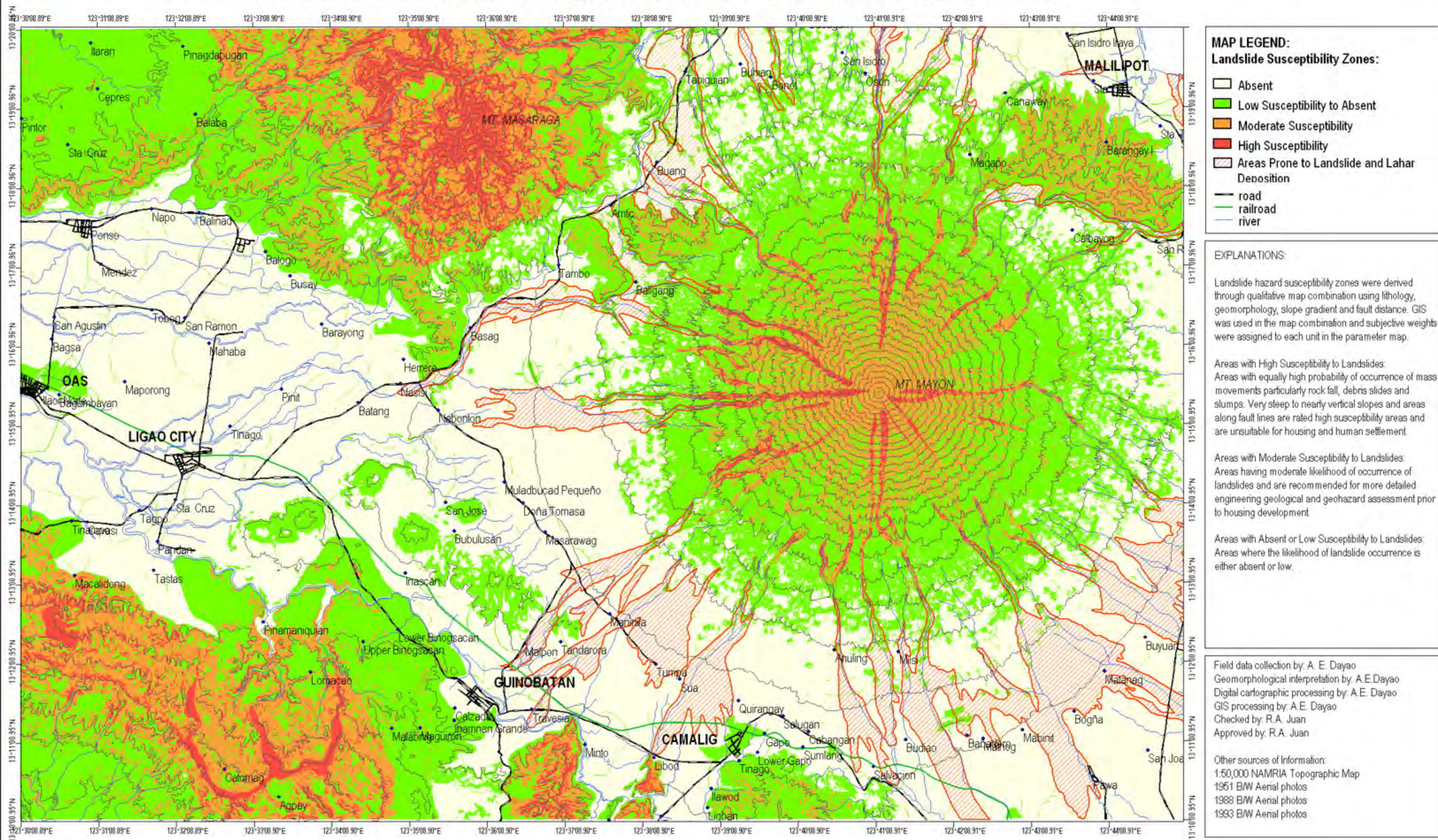
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 Clarke 1866, Luzon Datum

LANDSLIDE SUSCEPTIBILITY MAP OF BACACAY QUADRANGLE



LANDSLIDE SUSCEPTIBILITY MAP OF LIGAO QUADRANGLE



MAP LEGEND: Landslide Susceptibility Zones:

- Absent
- Low Susceptibility to Absent
- Moderate Susceptibility
- High Susceptibility
- Areas Prone to Landslide and Lahar Deposition
- road
- railroad
- river

EXPLANATIONS:

Landslide hazard susceptibility zones were derived through qualitative map combination using lithology, geomorphology, slope gradient and fault distance. GIS was used in the map combination and subjective weights were assigned to each unit in the parameter map.

Areas with High Susceptibility to Landslides:
Areas with equally high probability of occurrence of mass movements particularly rock fall, debris slides and slumps. Very steep to nearly vertical slopes and areas along fault lines are rated high susceptibility areas and are unsuitable for housing and human settlement.

Areas with Moderate Susceptibility to Landslides:
Areas having moderate likelihood of occurrence of landslides and are recommended for more detailed engineering geological and geohazard assessment prior to housing development.

Areas with Absent or Low Susceptibility to Landslides:
Areas where the likelihood of landslide occurrence is either absent or low.

Field data collection by: A. E. Dayao
Geomorphological interpretation by: A.E. Dayao
Digital cartographic processing by: A.E. Dayao
GIS processing by: A.E. Dayao
Checked by: R.A. Juan
Approved by: R.A. Juan

Other sources of Information:
1:50,000 NAMRIA Topographic Map
1951 B/W Aerial photos
1988 B/W Aerial photos
1993 B/W Aerial photos

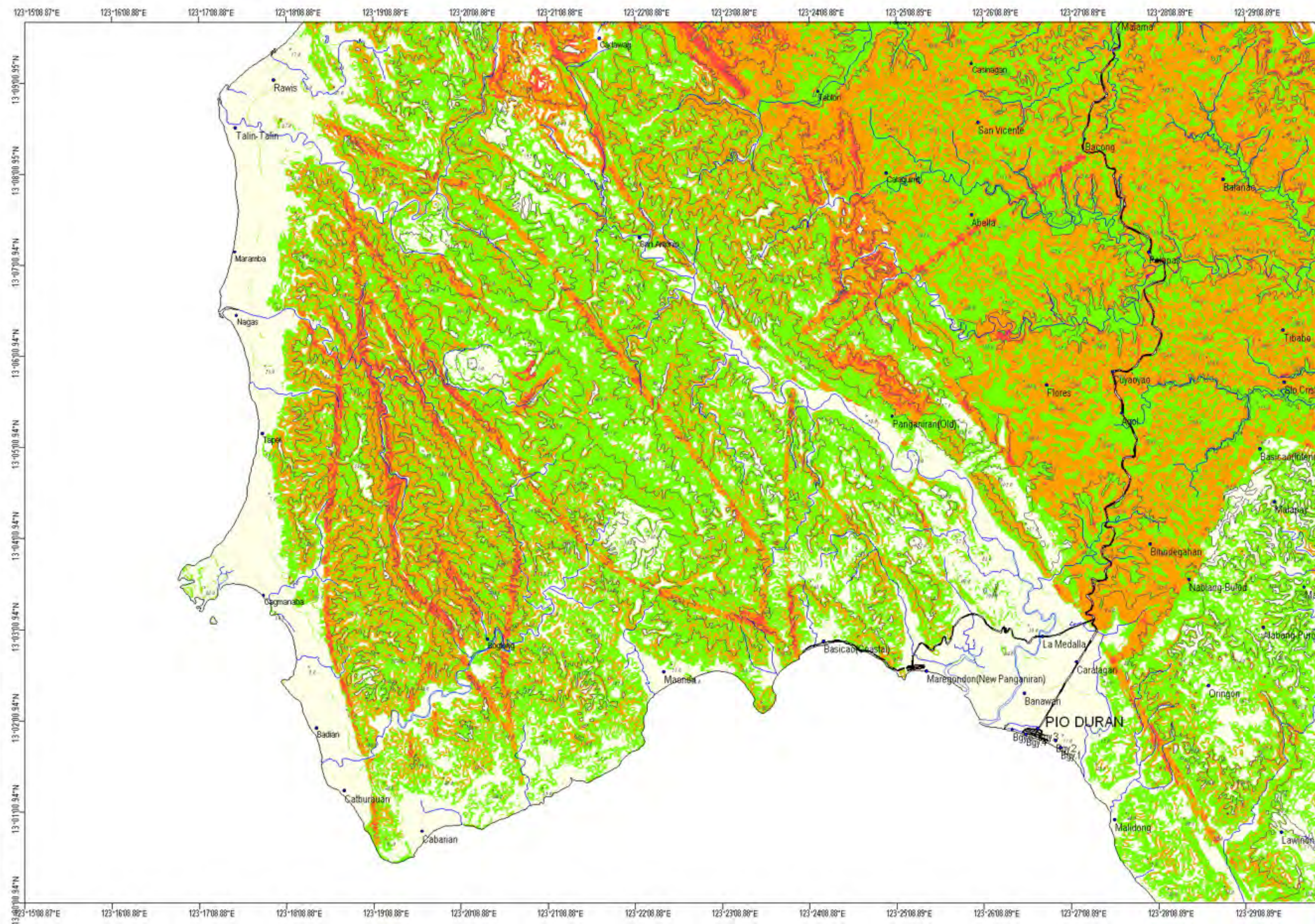


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Department of Environment and Natural Resources
MINES AND GEOSCIENCES BUREAU-RO6
Daraga, Albay
2007

1 : 85000
0 4250 m
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Clarke 1866, Luzon Datum



LANDSLIDE SUSCEPTIBILITY MAP OF PANGANIRAN QUADRANGLE



MAP LEGEND:

Landslide Susceptibility Zones:

- Absent
- Low susceptibility
- Moderate susceptibility
- High susceptibility

- fault
- river
- road

EXPLANATIONS:

Landslide hazard susceptibility zones were derived through qualitative map combination using lithology, geomorphology, slope gradient, road distance and fault distance. GIS was used in the map combination and subjective weights were assigned to each unit in the parameter map.

Areas with High Susceptibility to Landslides:
Areas with equally high probability of occurrence of mass movements particularly rock slides, debris slides and slumps. Very steep to nearly vertical slopes and areas along fault lines are rated high susceptibility areas and are unsuitable for housing development.

Areas with Moderate Susceptibility to Landslides:
Areas having moderate likelihood of occurrence of landslides and are recommended for more detailed engineering geological and geohazard assessment prior to housing development.

Areas with Absent or Low Susceptibility to Landslides:
Areas where the likelihood of landslide occurrence is either absent or low.

Field data collection by: E.L. Laguerta & D.D. Velante
Geomorphologic interpretation by: A.E. Dayao & E.L. Laguerta
Digital cartographic processing by: A.E. Dayao & E.L. Laguerta
GIS processing by: A.E. Dayao & E.L. Laguerta
Checked by: A.E. Dayao
Approved by: R.A. Juan

Other sources of Information:
1:50,000 NAMRIA Topographic Map
1951 B/W Aerial photos
1988 B/W Aerial photos



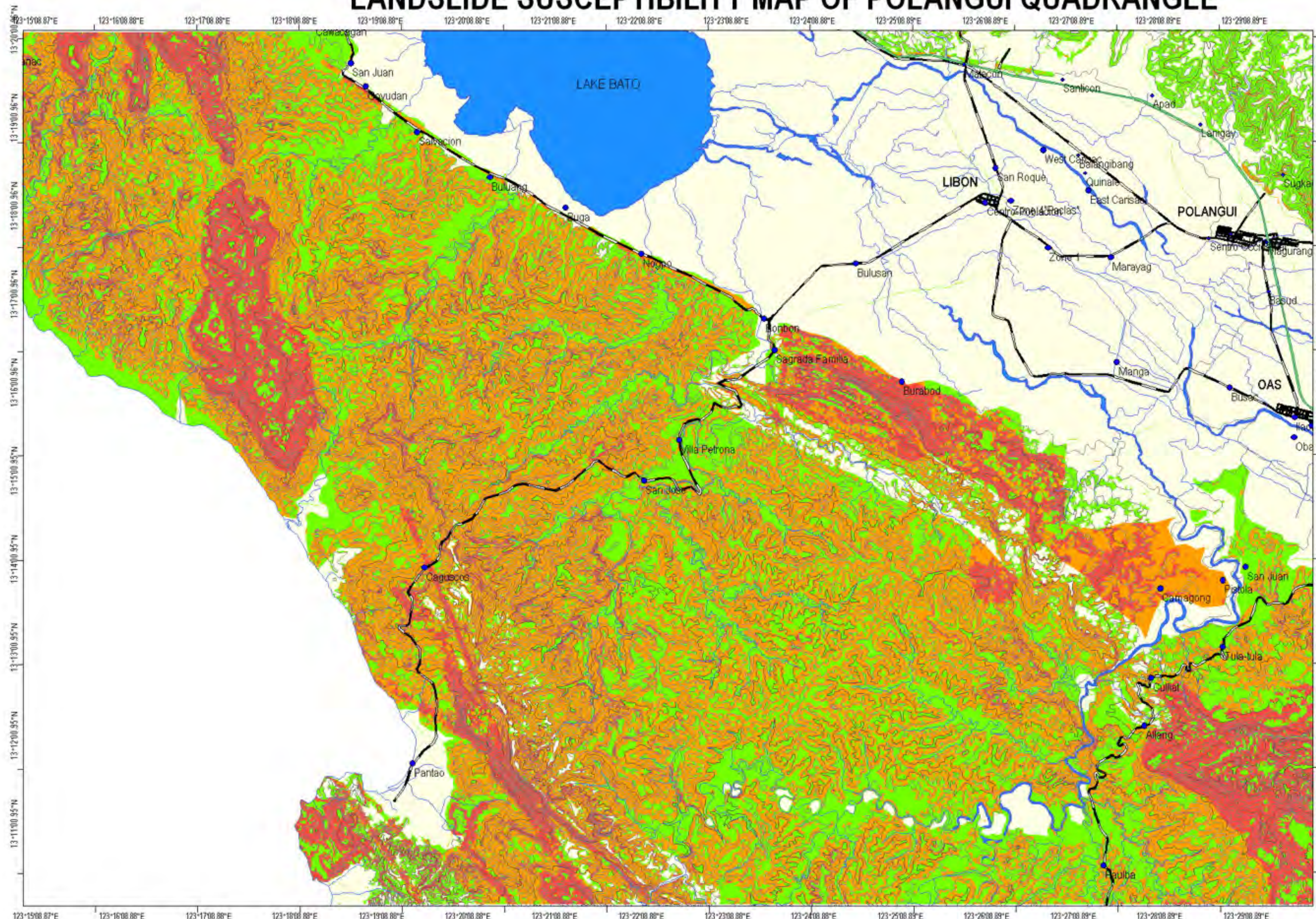
Published by:
Department of Environment and Natural Resources
MINES AND GEOSCIENCES BUREAU-RO5
Davao, Albay
2007

0 1 : 85000 4250 m

UNIVERSAL TRANSVERSE MERCATOR PROJECTION
Clarke 1886, Luzon Datum



LANDSLIDE SUSCEPTIBILITY MAP OF POLANGUI QUADRANGLE



MAP LEGEND:

Landslide Susceptibility Zones:

- Low Susceptibility to Absent
- Moderate Susceptibility
- High Susceptibility
- Absent

- fault
- river
- road
- railroad

EXPLANATIONS:

Landslide hazard susceptibility zones were derived through qualitative map combination using lithology, geomorphology, slope gradient, road distance and fault distance. GIS was used in the map combination and subjective weights were assigned to each unit in the parameter map.

Areas with High Susceptibility to Landslides:
Areas with equally high probability of occurrence of mass movements particularly rock slides, debris slides and slumps. Very steep to nearly vertical slopes and areas along fault lines are rated high susceptibility areas and are unsuitable for housing development and human settlement.

Areas with Moderate Susceptibility to Landslides:
Areas having moderate likelihood of landslide occurrence and are recommended for more detailed engineering geological and geohazard assessment prior to housing development.

Areas with Low Susceptibility to Landslides:
Areas where the occurrence of landslides is low.

Absent:
Areas where the likelihood of landslide occurrence is absent.

Field data collection by J.M.S.Laud
Geomorphologic interpretation by J.M.S.Laud
Digital cartographic processing by E.L.Laguerta
GIS processing by J.M.S.Laud
Checked by A.E. Dayao
Approved by R.A. Juan

Other sources of Information:
1:50,000 scale NAMRIA Topographic Map
1951 B/W Aerial Photographs



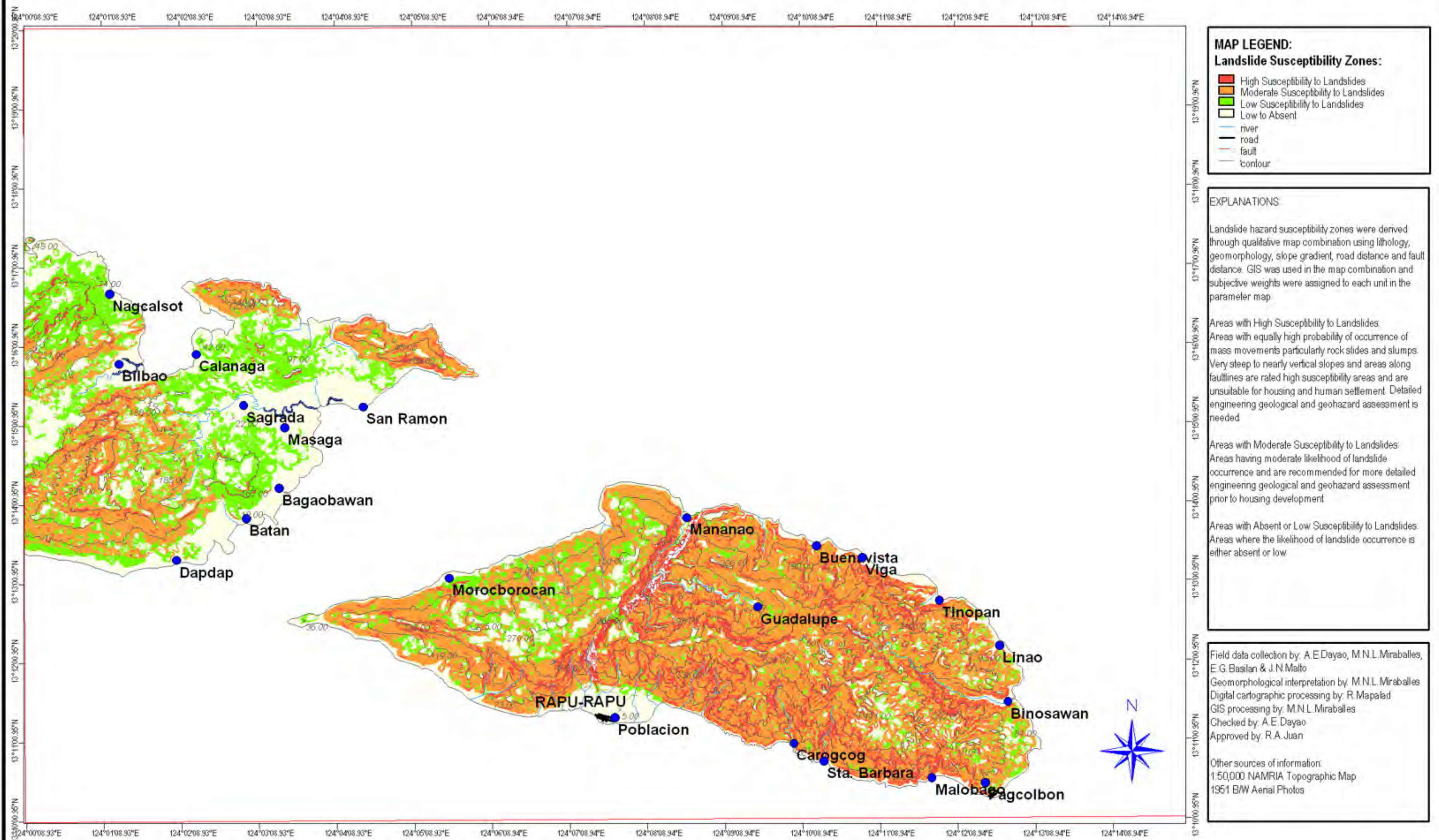
Published by:
Department of Environment and Natural Resources
MINES AND GEOSCIENCES BUREAU-RO5
Daraga, Albay
2007

0 1 : 85000 4250

Universal Transverse Mercator Projection
Clark 1866, Luzon Datum



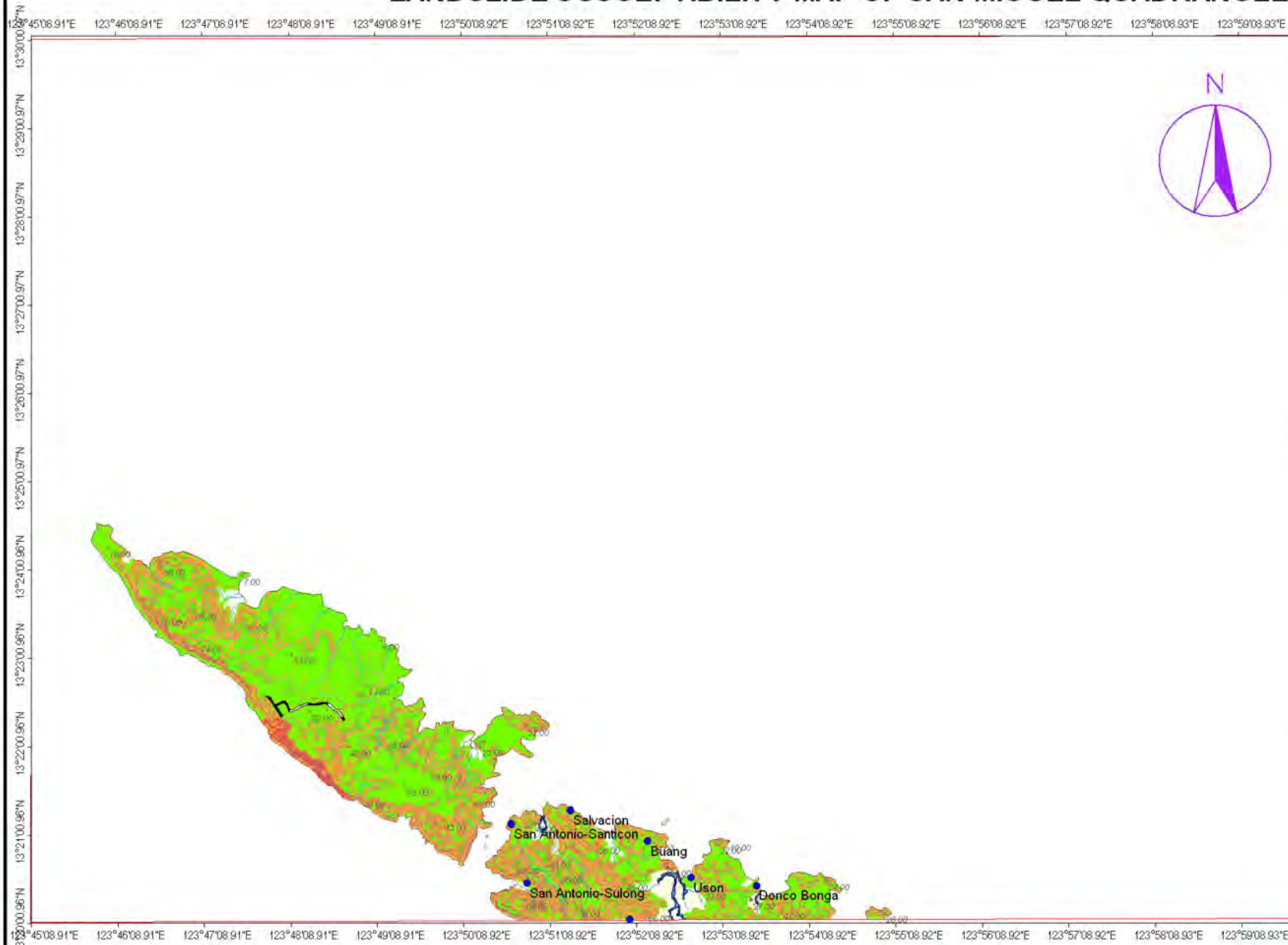
LANDSLIDE SUSCEPTIBILITY MAP OF RAPU-RAPU QUADRANGLE



Published by
Department of Environmental and Natural Resources
MINES AND GEOSCIENCES BUREAU RO-5
Rais, Legaspi City
2008

0 4250 m
UNIVERSAL TRANSVERSE MERCATOR PROJECTION
Clarke 1866, Luzon Datum

LANDSLIDE SUSCEPTIBILITY MAP OF SAN MIGUEL QUADRANGLE



MAP LEGEND:

Landslide Susceptibility Zones:

- High Susceptibility
- Moderate Susceptibility
- Low Susceptibility
- Absent to Low

- contour
- river
- road

EXPLANATIONS:

Landslide susceptibility zones were derived through qualitative map combination using lithology, geomorphology, slope gradient, road distance and fault distance as input parameters. GIS was used in the map combination and subjective weights were assigned to each unit in the parameter map.

Areas with High Susceptibility to Landslides:

Areas having high probability of occurrence of mass movements particularly debris slides and slumps. Very steep to nearly vertical slopes and areas along faultlines are rated high susceptibility areas and are unsuitable for housing and human settlement. Detailed engineering geological and geohazard assessment is needed.

Areas with Moderate Susceptibility to Landslides:

Areas having moderate likelihood of landslide occurrence are recommended for a more detailed engineering geological and geohazard assessment prior to housing development.

Areas with Low Susceptibility to Landslides:

Areas where the likelihood of landslide occurrence is low.

Areas with Absent Susceptibility to Landslides:

Areas where the likelihood of landslide occurrence is absent.

Field data collection by: M.R.M. Rint

Geomorphological interpretation by: M.N.L. Miraballes

Digital cartographic processing by: R. Mapalad & M.N.L. Miraballes

GIS processing by: M.N.L. Miraballes

Checked by: A.E. Dayao

Approved by: R.A. Juan

Other sources of information:

1:50,000 NAMRIA Topographic Map

1951 B/W Aerial Photos

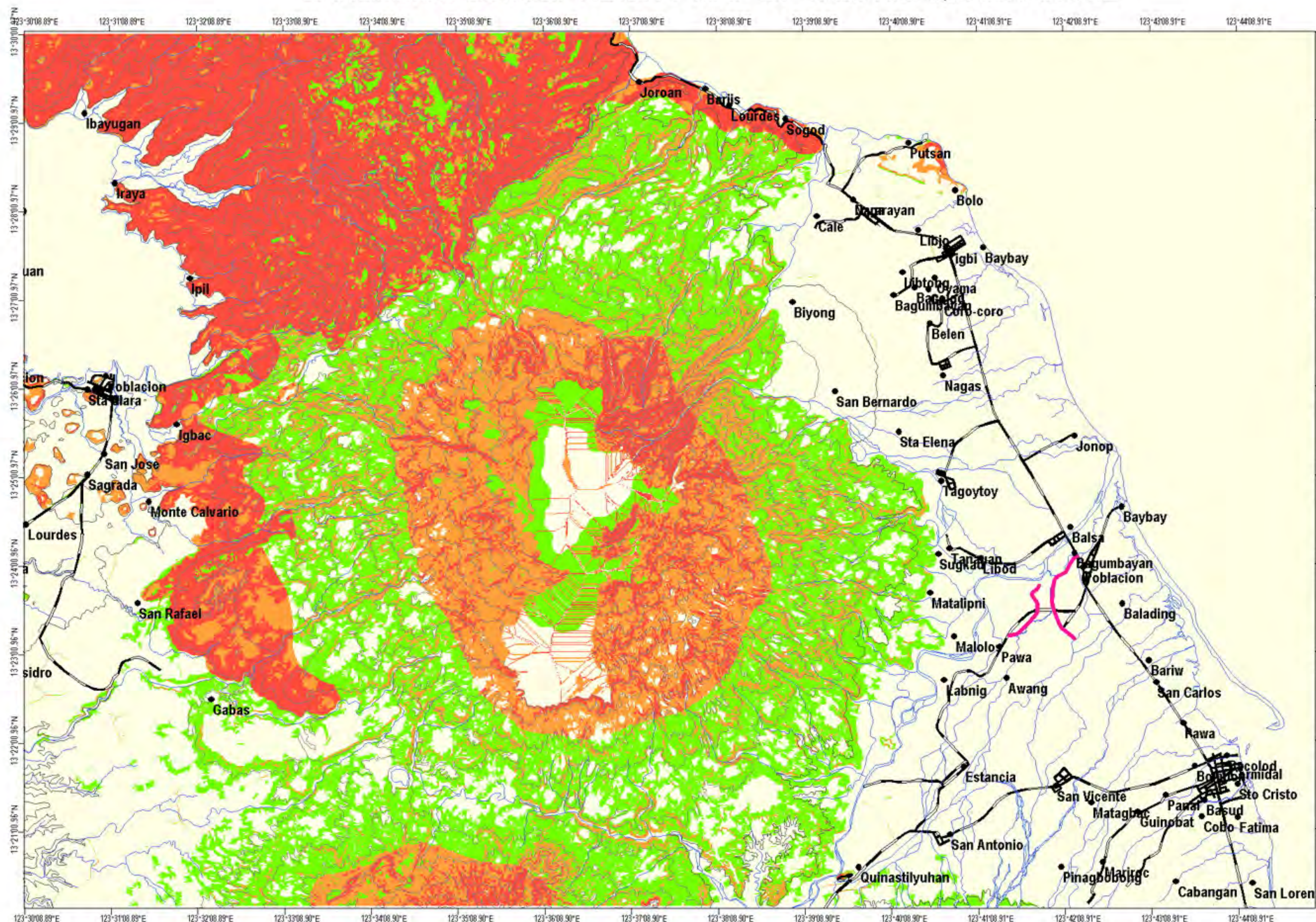


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Department of Environmental and Natural Resources
MINES AND GEOSCIENCES BUREAU RO-5
Rawis, Legazpi City
2009



UNIVERSAL TRANSVERSE MERCATOR PROJECTION
Clarke 1866, Luzon Datum

LANDSLIDE SUSCEPTIBILITY MAP OF TABACO QUADRANGLE



MAP LEGEND:
Landslide Susceptibility Zones:

- Absent
 Low Susceptibility
 Moderate Susceptibility
 High Susceptibility

EXPLANATIONS:

Landslide hazard susceptibility zones were derived through qualitative map combination using lithology, geomorphology, slope gradient, road distance and fault distance. GIS was used in the map combination and subjective weights were assigned to each unit in the parameter map.

Areas with High Susceptibility to Landslides: Areas with equally high probability of occurrence of mass movements particularly rock slides, debris slides and slumps. Very steep to nearly vertical slopes and areas along fault lines are rated high susceptibility areas and are unsuitable for housing development.

Areas with Moderate Susceptibility to Landslides:
Areas having moderate likelihood of occurrence of landslides and are recommended for more detailed engineering geological and geohazard assessment prior to housing development.

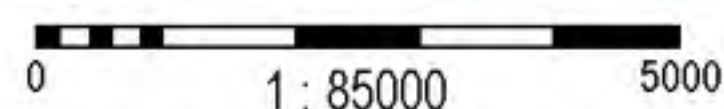
Areas with Absent or Low Susceptibility to Landslides:
Areas where the likelihood of landslide occurrence is either absent or low.

Field data collection by: Jose Marcel S. Laud
Geomorphological interpretation by: Jose
Marcel S. Laud
Digital cartographic processing by: Rosalyn L.
Mapalad
GIS processing by: Jose Marcel S. Laud
Checked by: Arlene E. Dayao
Approved by: Reynulfo A. Juan

Other sources of information:
1:50,000 NAMRIA Topographic Map
1951 B/W Aerial photos
1968 B/W Aerial photos



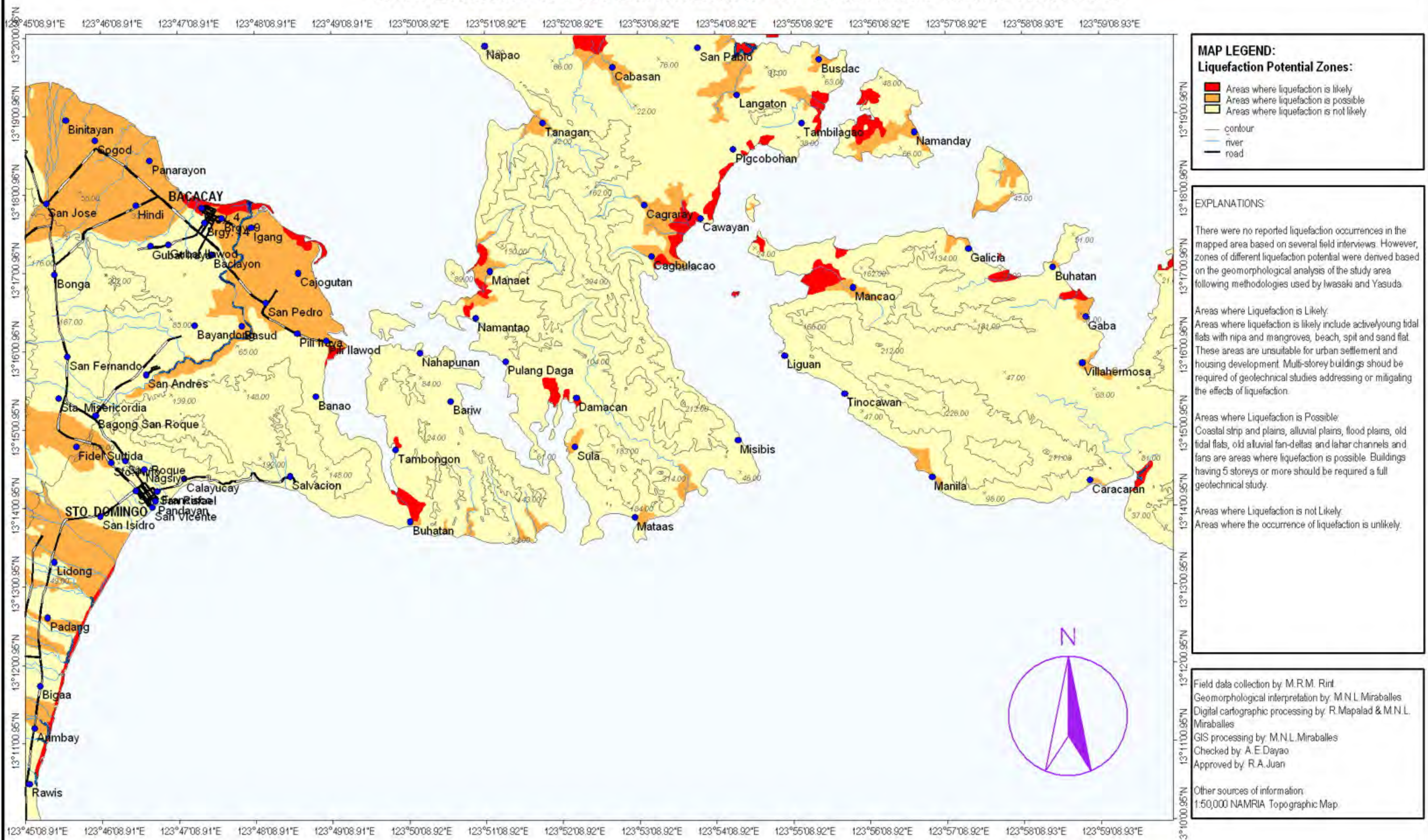
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Department of Environment and Natural Resources
MINES AND GEOSCIENCES BUREAU-RO5
Rawis, Legaspi City
2009



Universal Transverse Mercator Projection
Clarke 1866, Luzon Datum



LIQUEFACTION POTENTIAL MAP OF BACACAY QUADRANGLE

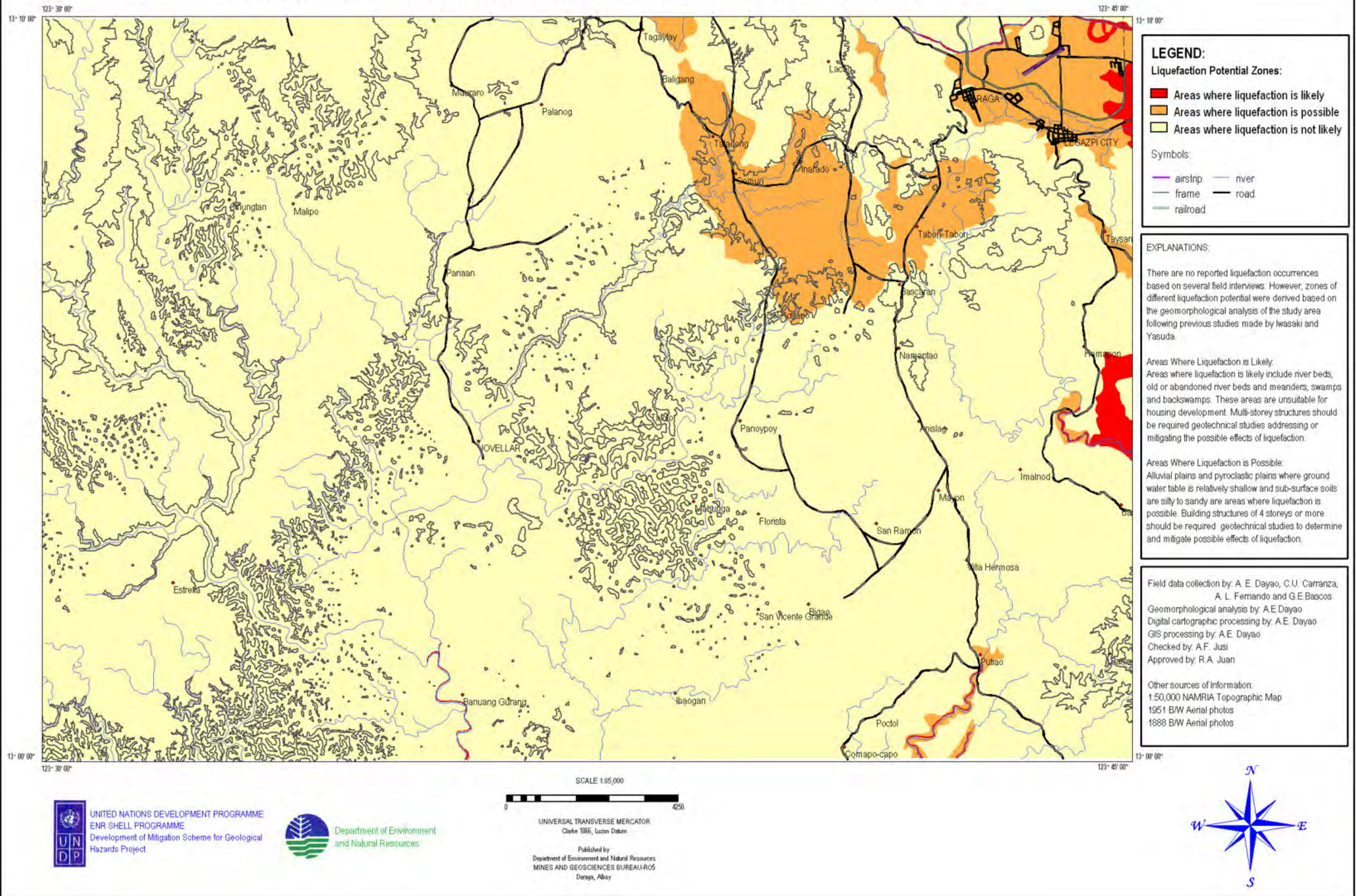


Published by:
 Department of Environmental and Natural Resources
 MINES AND GEOSCIENCES BUREAU RO-5
 Rawis, Legazpi City
 2009

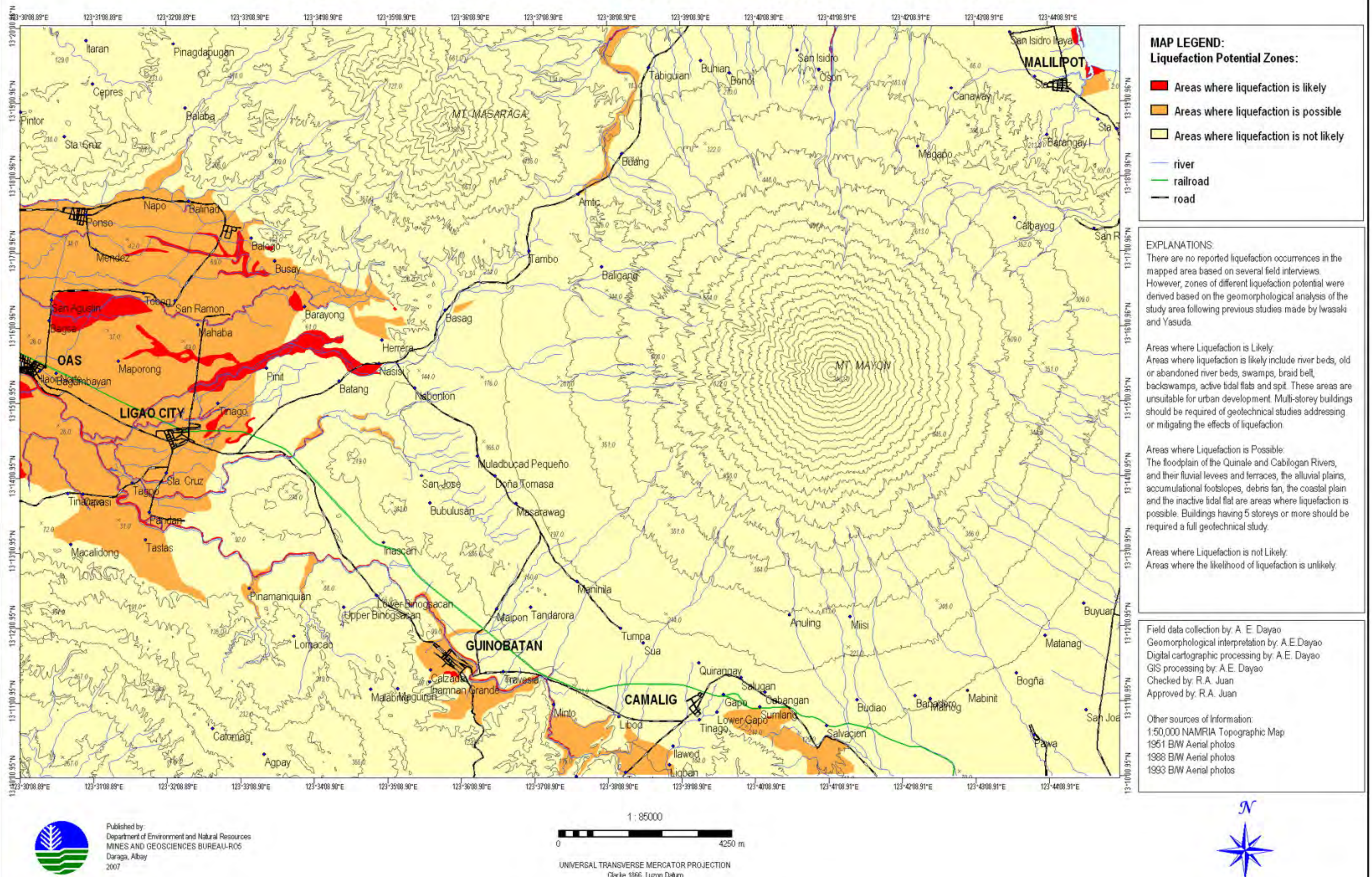
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UNIVERSAL TRANSVERSE MERCATOR PROJECTION
 Clarke 1866, Luzon Datum

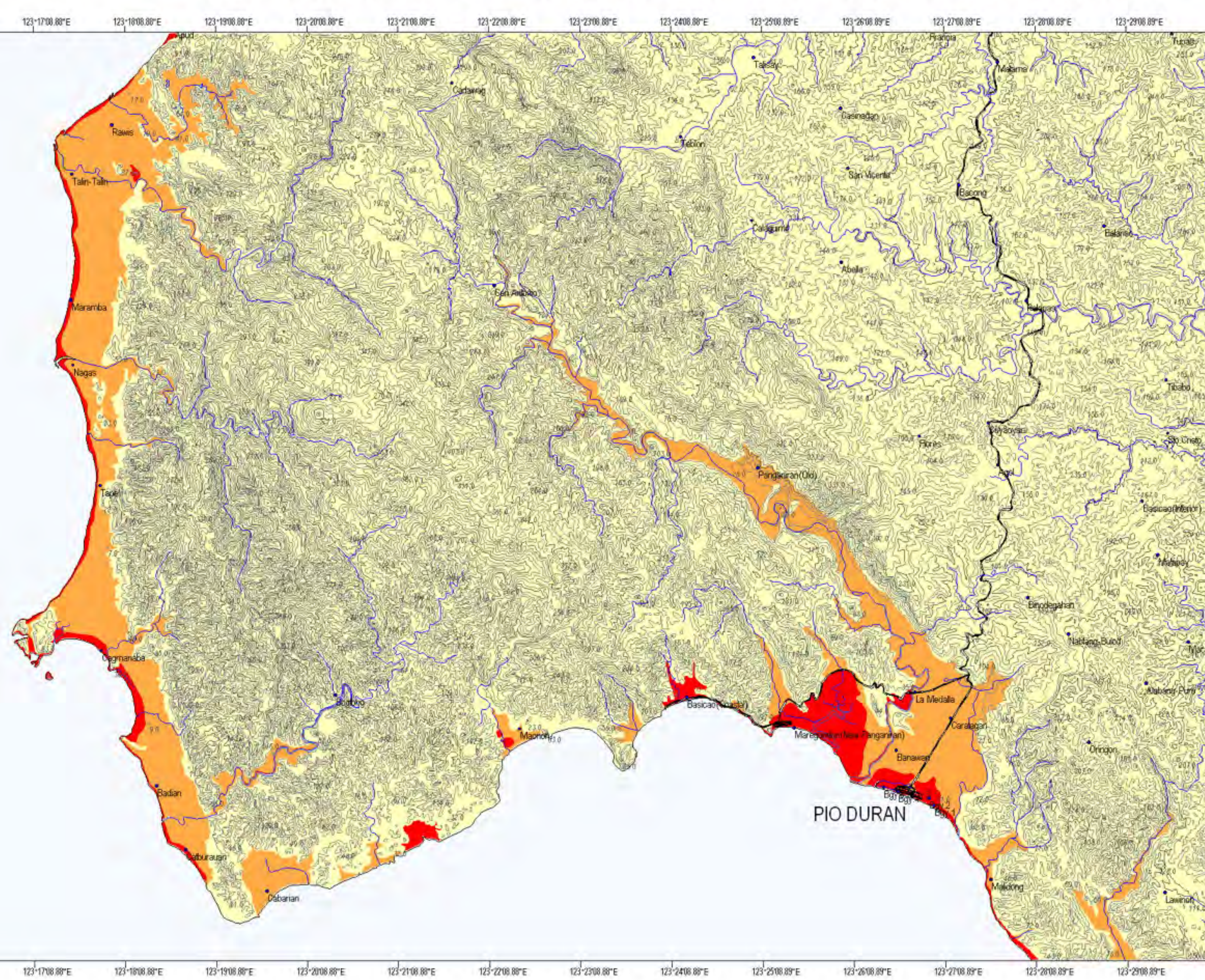
LIQUEFACTION POTENTIAL MAP OF LEGAZPI CITY QUADRANGLE



LIQUEFACTION POTENTIAL MAP OF LIGAO QUADRANGLE



LIQUEFACTION POTENTIAL MAP OF PANGANIRAN QUADRANGLE



MAP LEGEND: Liquefaction Potential Zones:

- Areas where liquefaction is likely
- Areas where liquefaction is possible
- Areas where liquefaction is not likely
- river
- road

EXPLANATIONS:

There are no reported liquefaction occurrences in the study area based on several interviews. However, zones of different liquefaction potential were derived based on the geomorphological analysis of the study area following criteria previously made by Iwasaki and Yasuda.

Areas where Liquefaction is Likely:
Areas where liquefaction is likely are confined within the riverbed of Panganiran River, the beach, spit, beach ridge and swale complex and the swamps along the coastal areas. These areas are unsuitable for community and urban settlement.

Areas where Liquefaction is Possible:
The likelihood of occurrence of liquefaction is less for these areas.

Areas where Liquefaction is not Likely:
Areas where the likelihood of liquefaction is unlikely. Most parts of the Panganiran Quadrangle Map sheet are not prone to liquefaction because of the underlying bedrocks.

Field data collection by: E.L. Lagueria & D.D. Velante
Geomorphological interpretation by: A.E. Dayao & E.L. Lagueria
Digital cartographic processing by: A.E. Dayao & E.L. Lagueria
GIS processing by: A.E. Dayao & E.L. Lagueria
Checked by: A.E. Dayao
Approved by: R.A. Juan

Other sources of Information:
1:50,000 NAMRIA Topographic Map
1951 B/W Aerial photos
1988 B/W Aerial photos



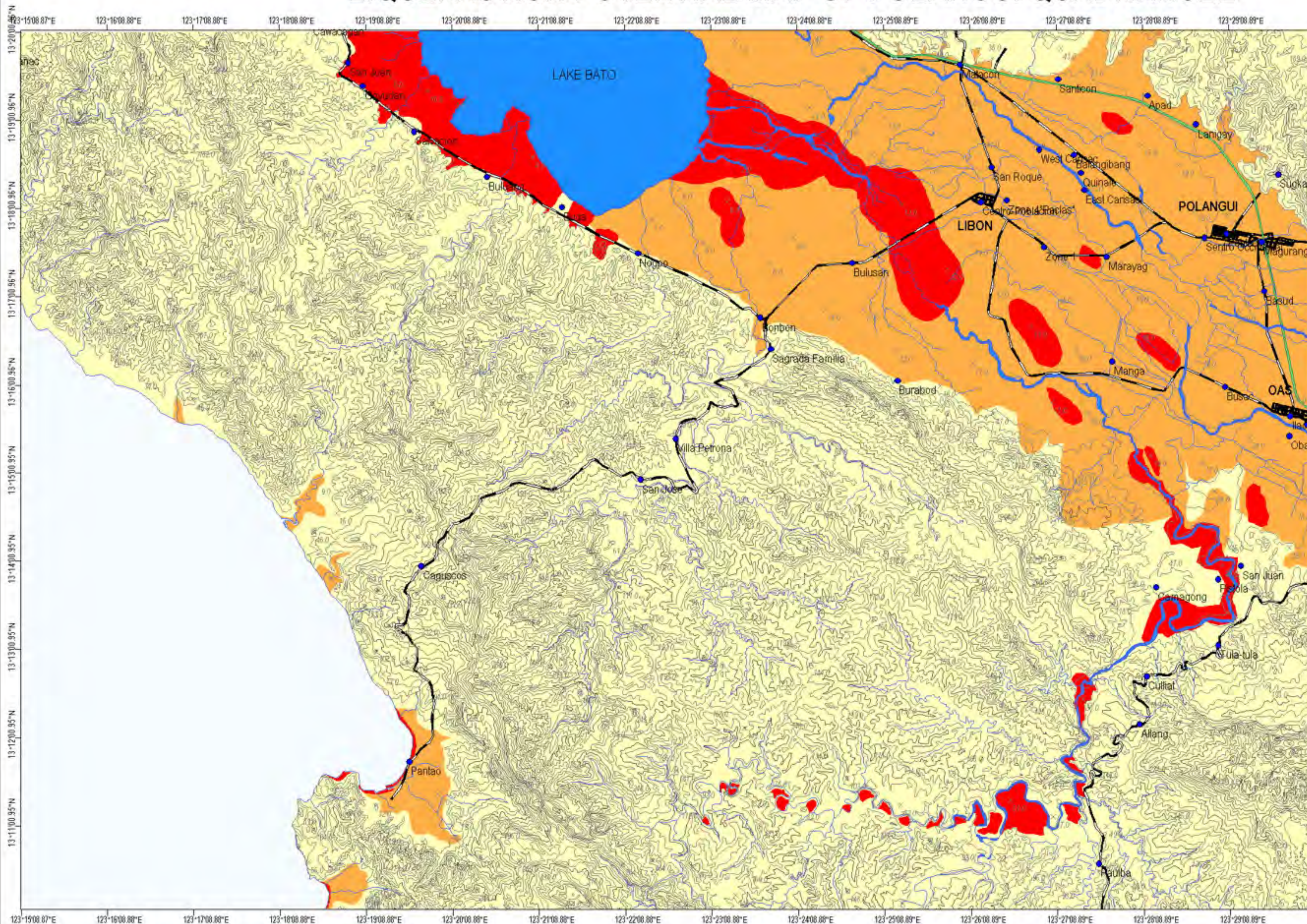
Published by
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MINES AND GEOSCIENCES BUREAU-05
Daraga, Albay
2007

0 1 : 85000 4250 m

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Clarke 1866, Luzon Datum



LIQUEFACTION POTENTIAL MAP OF POLANGUI QUADRANGLE



MAP LEGEND: Liquefaction Potential Zones:

- Areas where Liquefaction is Likely
- Areas where Liquefaction is Possible
- Areas where Liquefaction is not Likely
- road
- railroad
- river
- fault

EXPLANATIONS:

There are no reported liquefaction occurrences in the study area based on several interviews. However, zones of different liquefaction potential were derived based on the geomorphological lay of the study area following criteria made by Iwasaki and Yasuda.

Areas where Liquefaction is Likely:
Areas where liquefaction is likely to occur include the riverbeds, the backswamps and fluvial basins, the river terraces, the beach, the coastal plain, the lake and the lake fan. These areas are unsuitable for community or urban settlement.

Areas where Liquefaction is Possible:
The likelihood of liquefaction occurrence is less for these areas.

Areas where Liquefaction is not Likely:
Areas where liquefaction is unlikely to occur. Most parts of the Polangui Quadrangle map sheet is not prone to liquefaction because of the presence of underlying bedrock.

Field data collection by J.M.S. Laud
Geomorphologic interpretation by J.M.S. Laud
Digital cartographic processing by E.L. Laguerta
GIS processing by J.M.S. Laud
Checked by A.E. Dayao
Approved by R.A. Juan

Other sources of Information:
1:50,000 scale NAMRIA Topographic Map
1951 B/W Aerial Photographs



Published by:
Department of Environment and Natural Resources
MINES AND GEOSCIENCES BUREAU-RO5
Daraga, Albay
2007

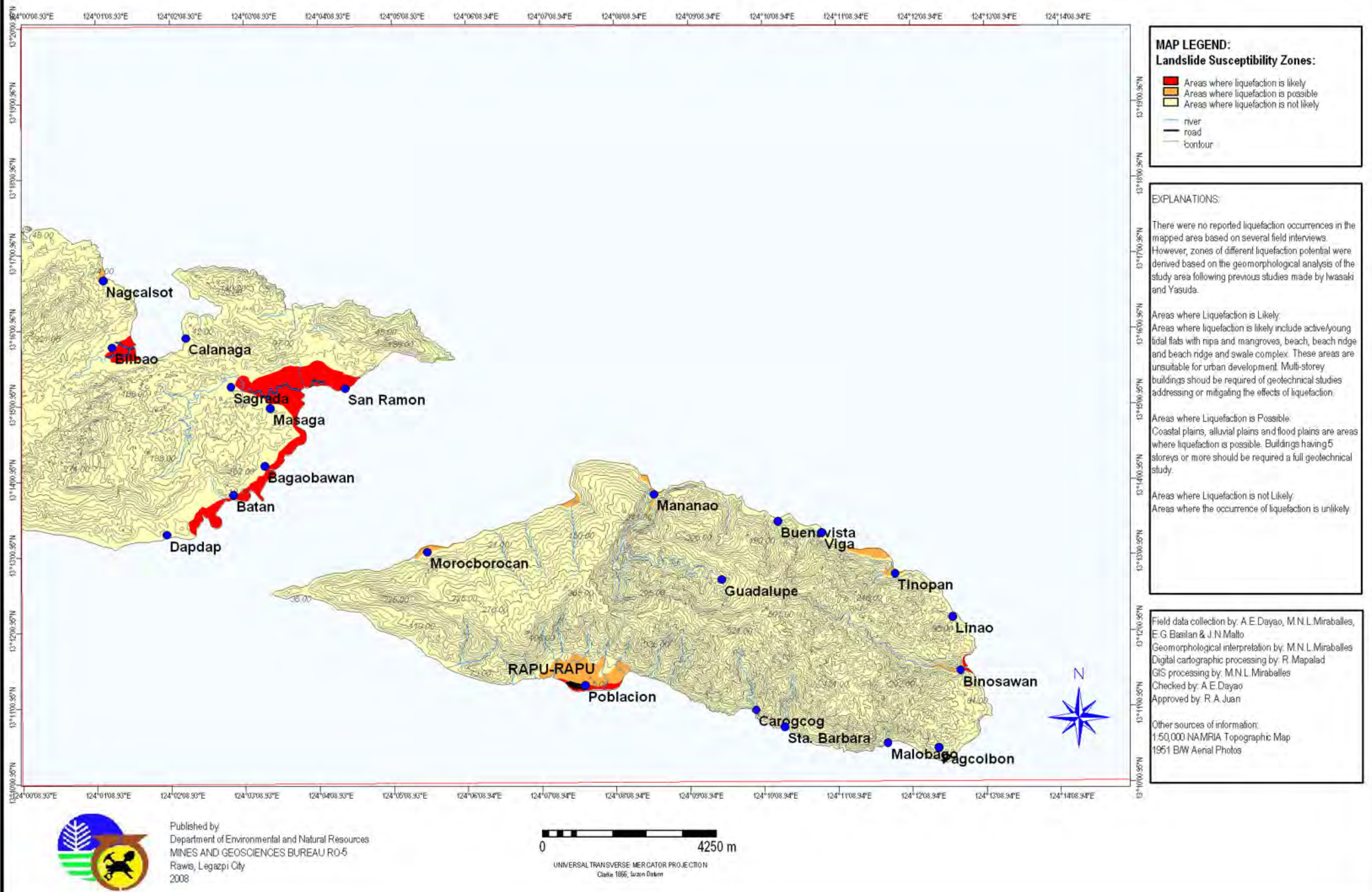


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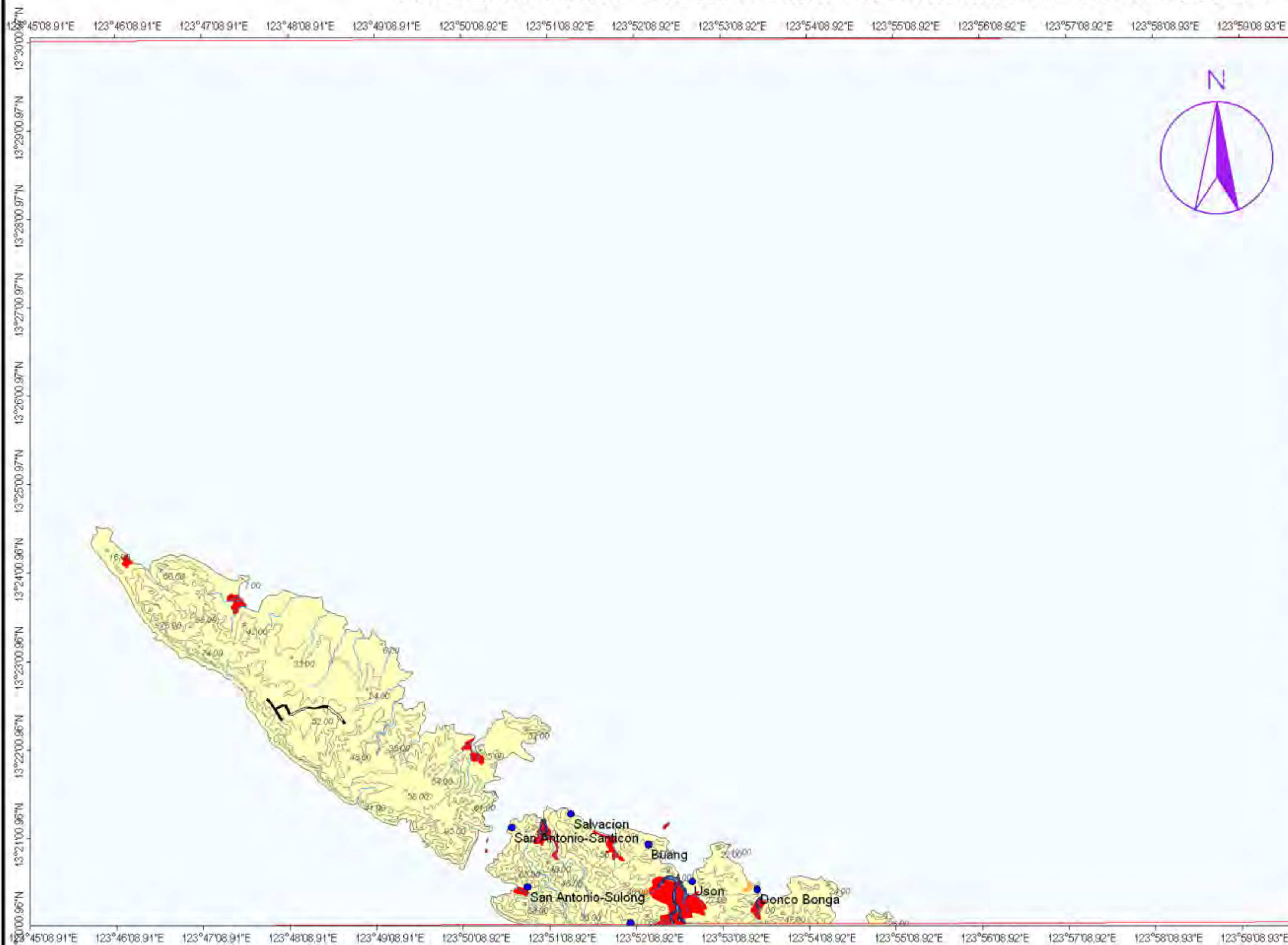
Universal Transverse Mercator Projection
Clark 1866, Luzon Datum



LIQUEFACTION POTENTIAL MAP OF RAPU-RAPU QUADRANGLE



LIQUEFACTION POTENTIAL MAP OF SAN MIGUEL QUADRANGLE



MAP LEGEND:

Liquefaction Potential Zones:

- Areas where liquefaction is likely
- Areas where liquefaction is possible
- Areas where liquefaction is not likely
- contour
- river
- road

EXPLANATIONS:

There were no reported liquefaction occurrences in the mapped area based on several field interviews. However, zones of different liquefaction potential were derived based on the geomorphological analysis of the study area following methodologies used by Iwasaki and Yasuda.

Areas where Liquefaction is Likely:
Areas where liquefaction is likely include active/young tidal flats with nipa and mangroves, beach ridge and sand flat. These areas are unsuitable for urban settlement and housing development. Multi-storey buildings should be required of geotechnical studies addressing or mitigating the effects of liquefaction.

Areas where Liquefaction is Possible:
Old tidal flats are areas where liquefaction is possible. Buildings having 5 storeys or more should be required a full geotechnical study.

Areas where Liquefaction is not Likely:
Areas where the occurrence of liquefaction is unlikely.

Field data collection by: M.R.M. Rint
Geomorphological interpretation by: M.N.L. Miraballes
Digital cartographic processing by: R. Mapalad & M.N.L. Miraballes
GIS processing by: M.N.L. Miraballes
Checked by: A.E. Dayao
Approved by: R.A. Juan

Other sources of information:
1:50,000 NAMRIA Topographic Map
1951 B/W Aerial Photos

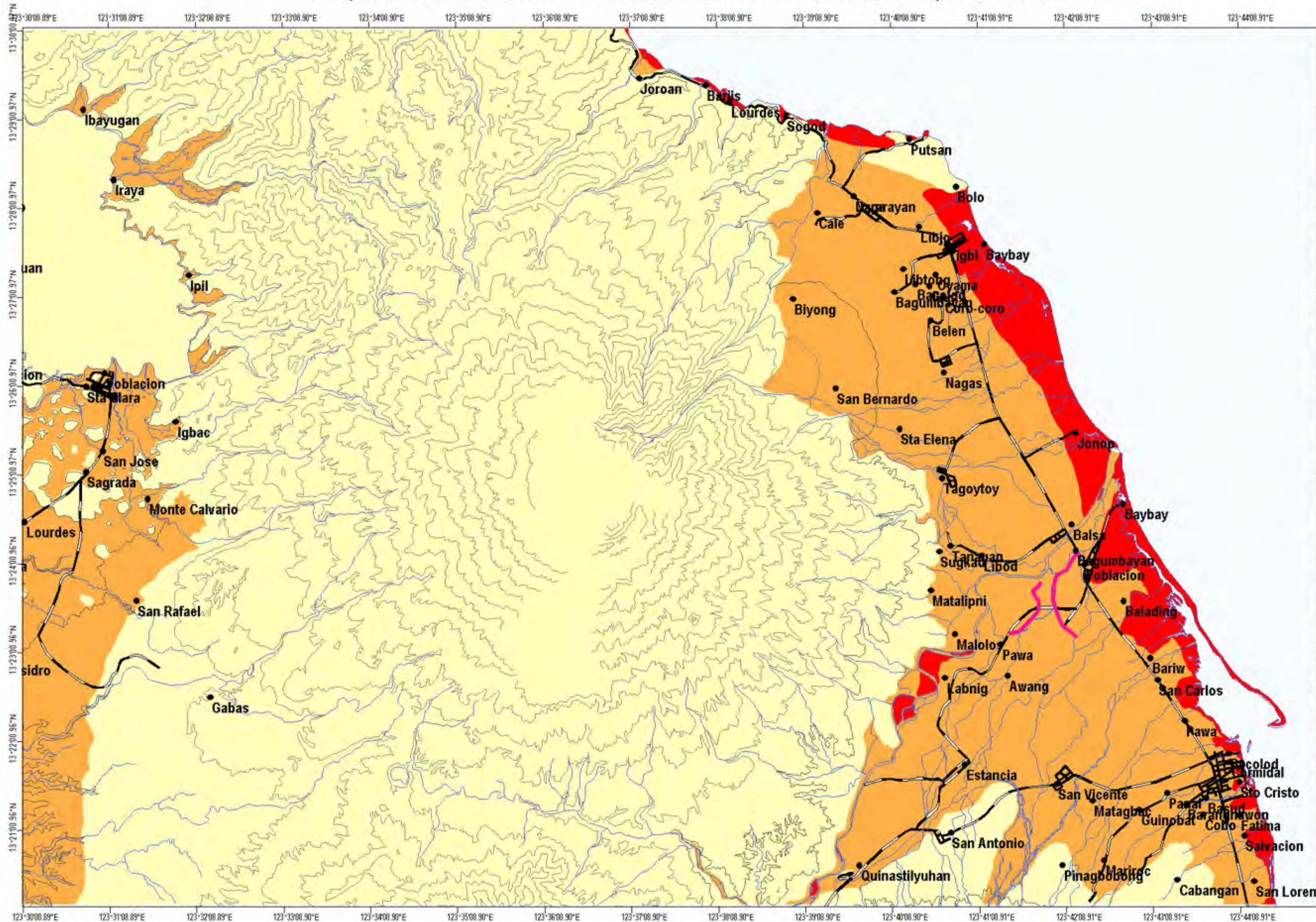


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LIQUEFACTION POTENTIAL MAP OF TABACO QUADRANGLE



MAP LEGEND:
Liquefaction Potential Zones:

- Areas where liquefaction is likely
- Areas where liquefaction is possible
- Areas where liquefaction is not likely

10
road
river

EXPLANATIONS:

There are no reported liquefaction occurrences in the study area based on several interviews. However, zones of different liquefaction potential were derived based on the geomorphological analysis of the study area following the criteria previously made by Iwasaki and Yasuda.

Areas where Liquefaction is Likely:
Areas where liquefaction is likely are confined within riverbeds, beaches, spits, active and old tidal flats, coastal plains and swamps along coastal areas. These areas are unsuitable for urban development. Multi-storey buildings should be required to undergo geotechnical studies addressing or mitigating the effects of liquefaction.

Areas where Liquefaction is Possible:
The alluvial plains covering the flatlands of the eastern portions of the Tabaco Quadrangle are areas where liquefaction is possible. Buildings having 5 storeys or more should be required to undergo a full geotechnical study.

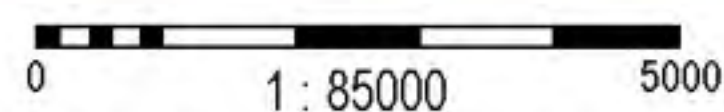
Areas where Liquefaction is Not Likely:
Areas where liquefaction occurrence is unlikely to happen because of the underlying stable bedrock conditions.

Field data collection by: Jose Marcel S. Laud
Geomorphological interpretation by: Jose Marcel S. Laud
Digital cartographic processing by: Rosalyn L. Mapalad
GIS processing by: Jose Marcel S. Laud
Checked by: Arlene E. Dayao
Approved by: Reynulfo A. Juan

Other sources of information:
1:50,000 NAMRIA Topographic Map
1951 B/W Aerial photos
1988 B/W Aerial photos



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