

Flood Hazard Map Presentation

Results of Flood Hazard Mapping of Surigao del Norte

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OUTLINE OF PRESENTATION

- I. Introduction**
- II. General Techniques in Mapping Used**
- III. Analysis**
- IV. Presentation of Outputs**

I. Introduction

What is Flood? Is relatively high flow in a river or stream

What is Flooding ? Is overflowing of water from the normal confines of a river or stream



What causes Floods.?

Heavy Rainfall
due to :

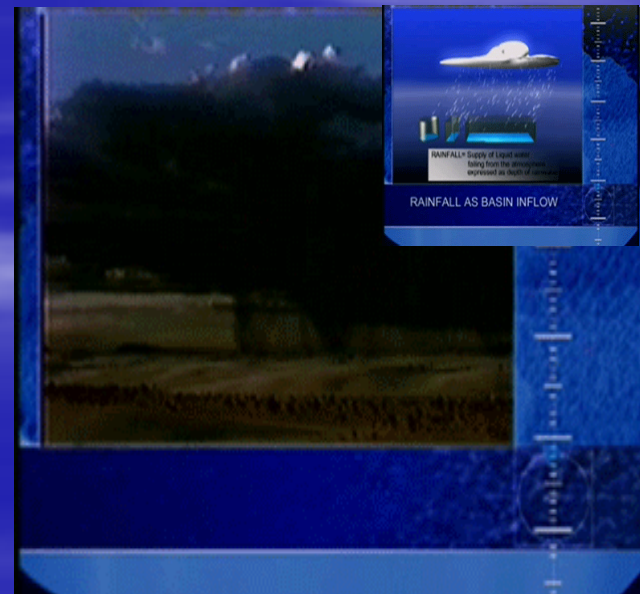
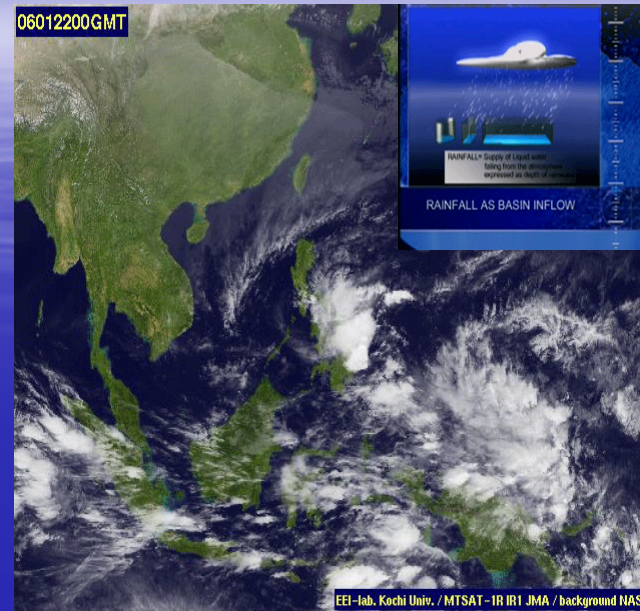
Tropical Cyclones

Thunderstorms

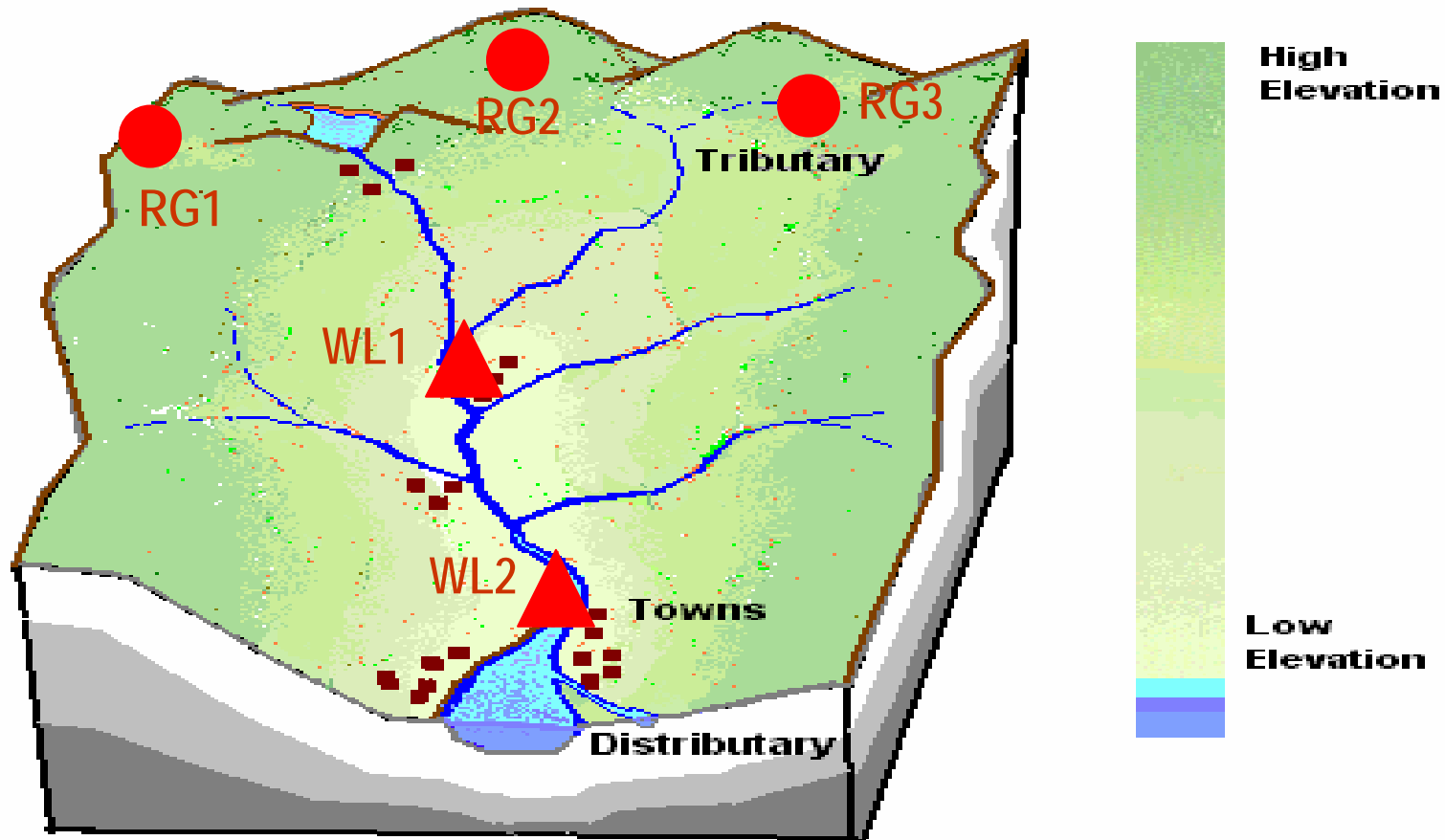
Monsoons

Intertropical
Convergence Zone
(ITCZ)

Cold Fronts

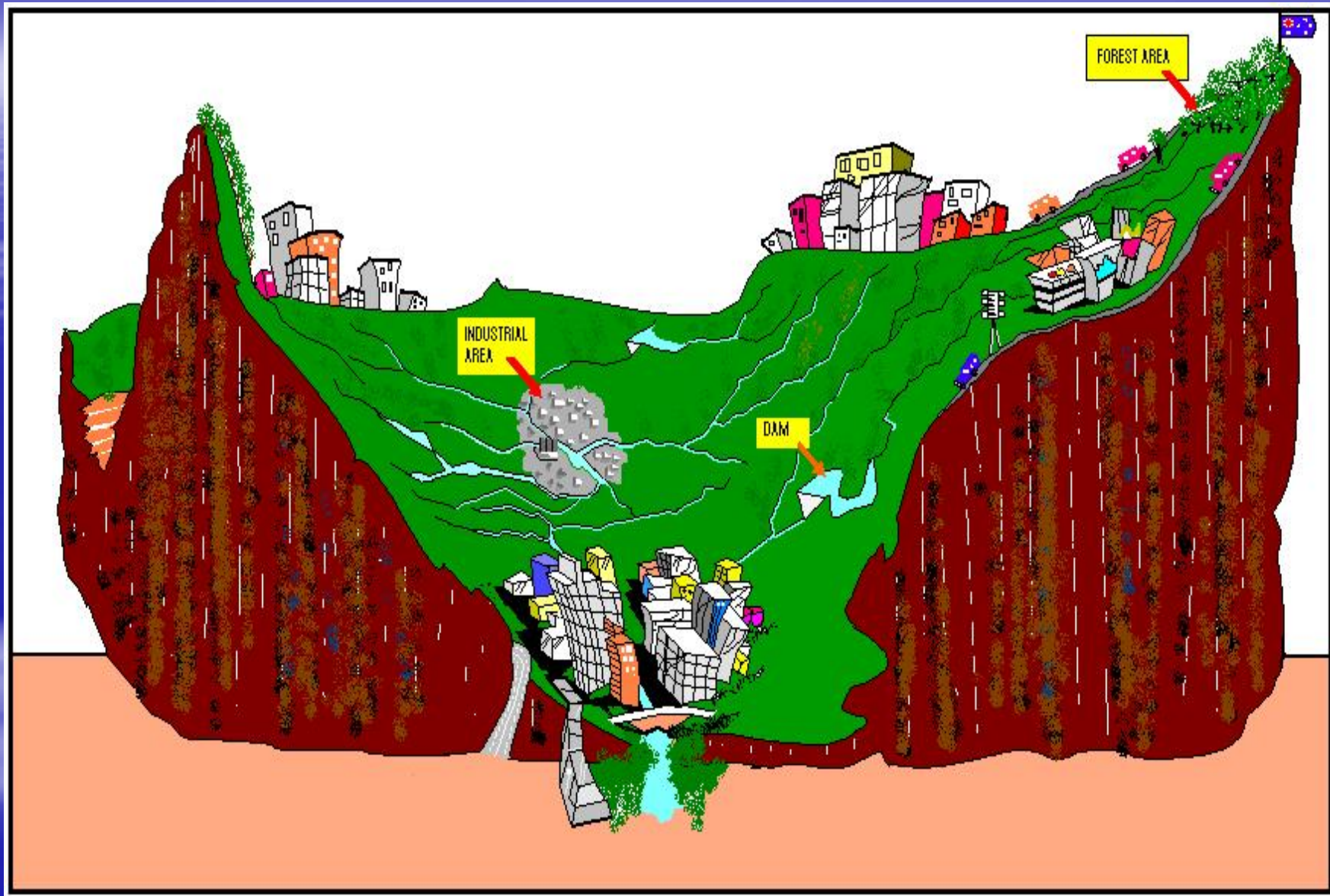


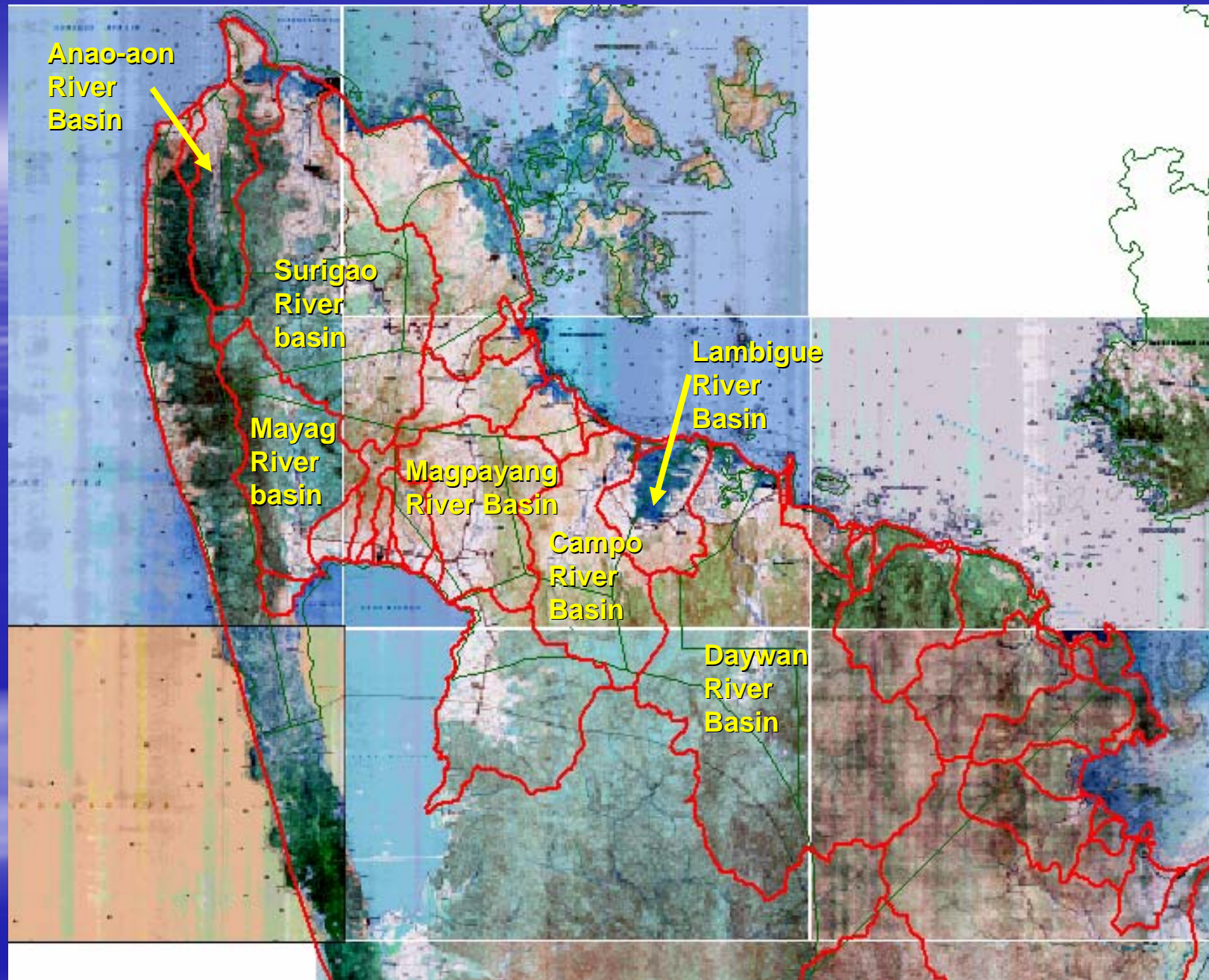
What is a River Basin? Is a drainage area of a river, stream or lake



A 3-D View of a River Basin

Drainage Basin





River Basins in Mainland Surigao del Norte

II. General Techniques in Mapping Used

- Geomorphological Approach
 - *Qualitative to semi quantitative*
 - *Employs study of landforms and associated hazards*
 - *Uses Geomorphological Mapping System (TMU)*
 - *Necessity for remote sensing data and aerial photographs*
 - *Necessity of fieldworks*
 - *Discipline-oriented*

Methodology

Data Collection

- *Maps*
- *Aerial photographs and remote sensing data*
- *Historical records of events*
- *Previous works*

Photo interpretation

- *Stereophoto interpretation*
- *Drainage analysis*
- *Delineation and identification of
Geomorphological Mapping System*

Fieldworks

- *Verification and mapping*

Tabletop Analysis (stereophoto-interpretation)

- *Photo-Interpretation using aerial photographs or other remotely sensed data*
- *Topographic analysis using topographic or relief maps*
- *Delineation of Geomorphological Mapping System or Terrain mapping units (TMU)*
- *Drainage basin inventory and quantification*

Result = Preliminary Flood Hazard Map

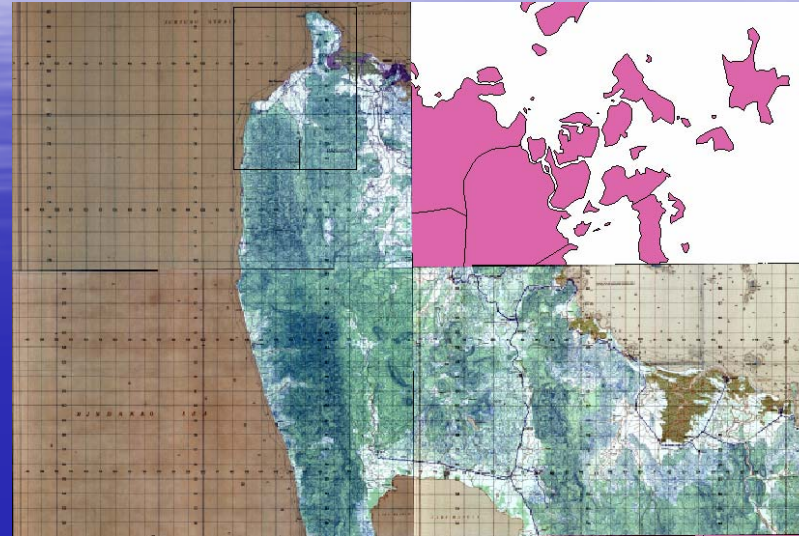
Fieldworks (mapping and verification)

- Detailed mapping of landform features
- Mapping of critical river systems and settlements
- Actual interview of residents
- Cross-checking of preliminary flood hazard map
- Correlation with available historical records and actual interviews

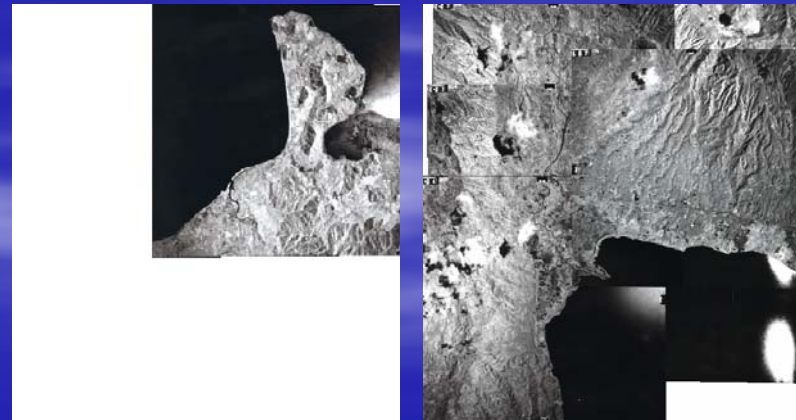
Result= Final Flood Hazard Map

Data Collection

- *Maps*

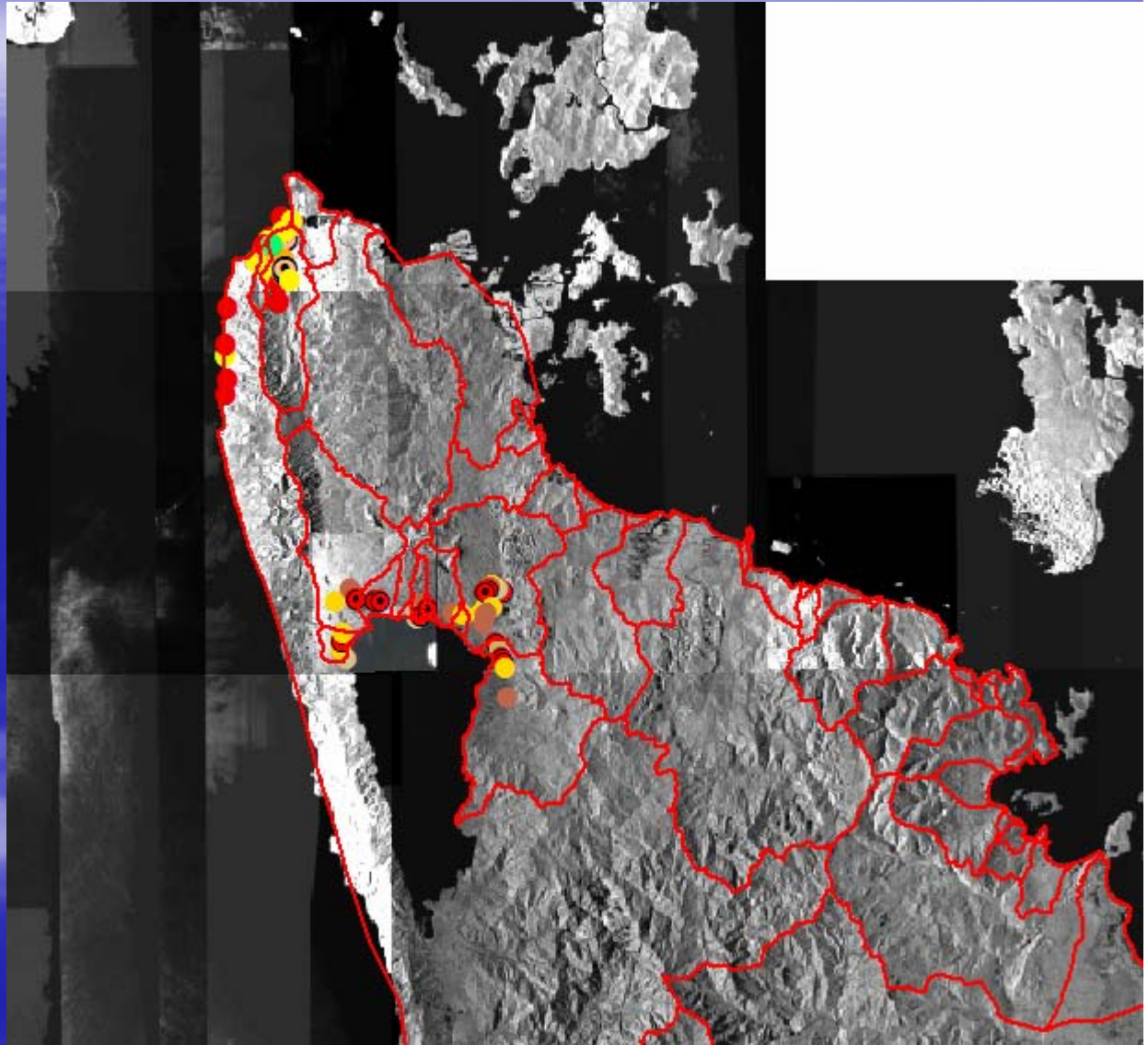


- *Aerial photographs*



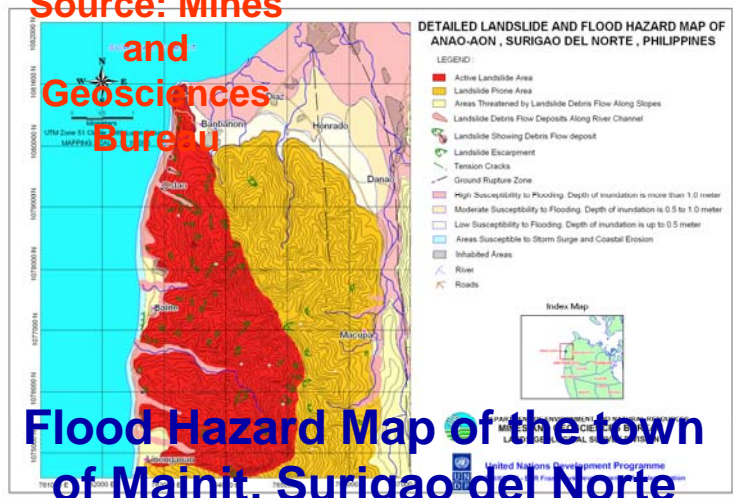
Data Collection

- **Satellite Imageries**



Data Collection

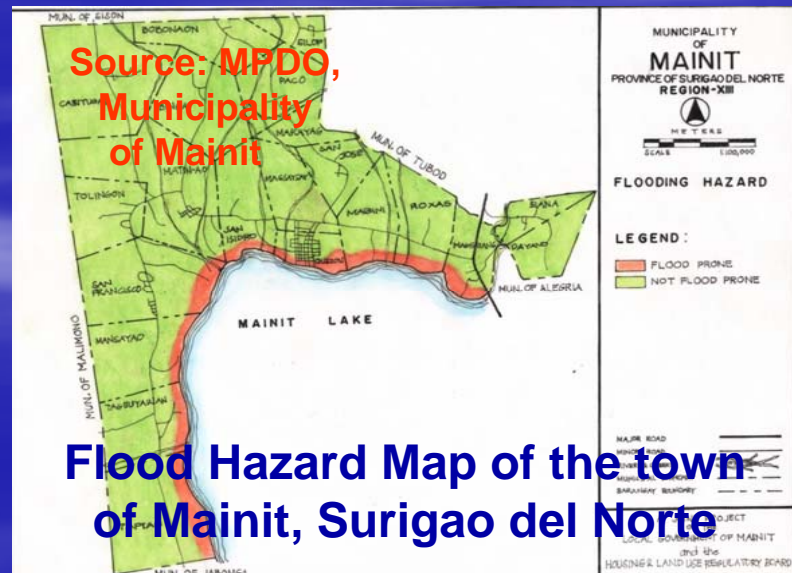
Source: Mines
and
Geosciences
Bureau



Flood Hazard Map of the town of Mainit, Surigao del Norte

- *Previous works*

Source: MPDO,
Municipality
of Mainit



Flood Hazard Map of the town of Mainit, Surigao del Norte

Data Collection

- *Drainage Analysis*



Field Works

- **Location**

*Name of Sitio, Barangay
Municipality, Coordinates*

- **Flood
Information**

*History, Frequency
Height, Depth, Extent, etc.*

- **Geomorphology**

- **Resource Person**

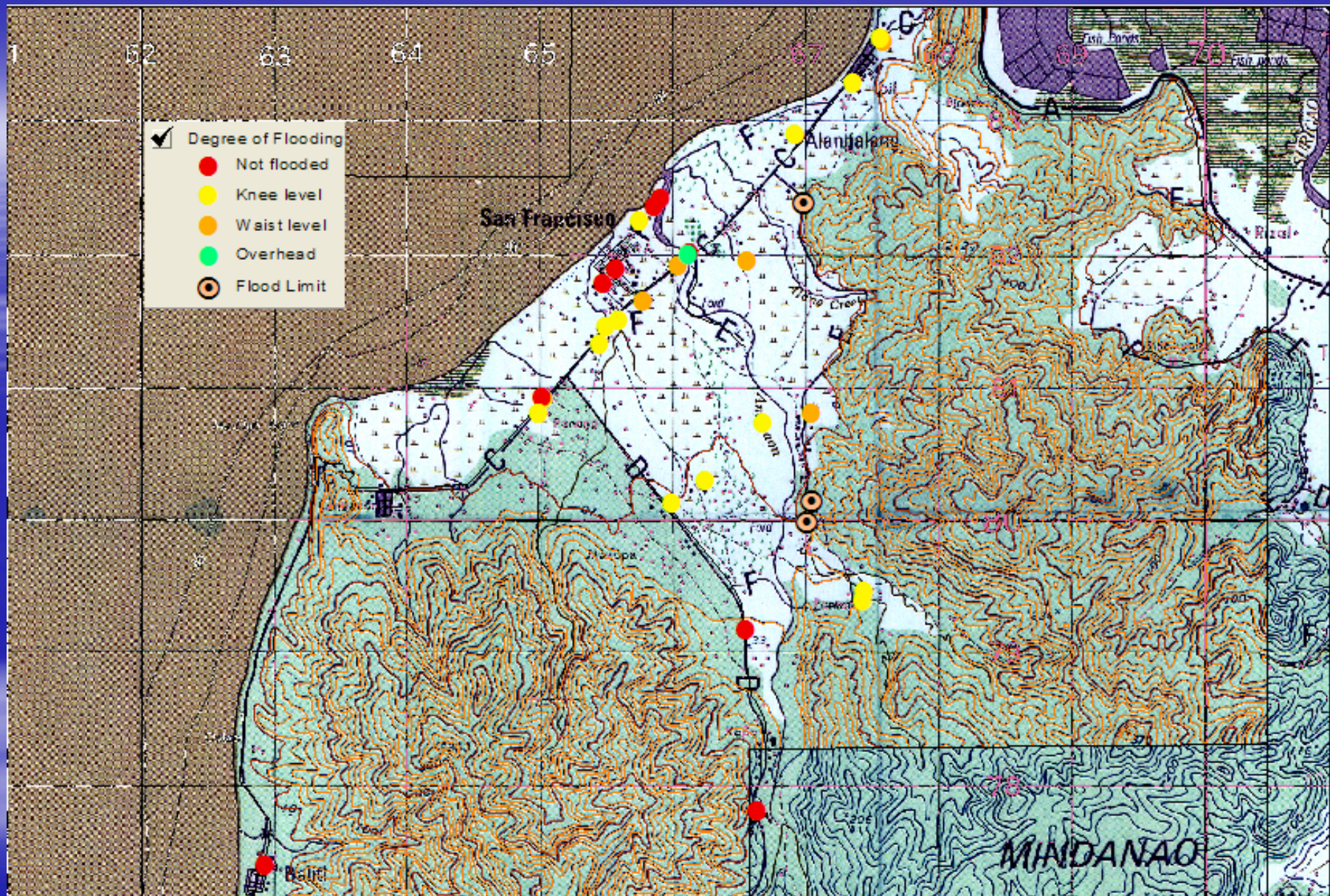


<i>Point</i>	<i>Longitude</i>	<i>Latitude</i>	<i>Location</i>	<i>Elevation</i>	<i>Flood leve</i>	<i>Remarks</i>	<i>Resource</i>
1	125.424660000	9.763150000	Brgy. Honrado, San Francisco		1	Knee deep	
2	125.431020000	9.768600000	Brgy Honrado, San Francisco,		1	Knee deep	
3	125.427020000	9.764650000	Brgy. Honrado		1	Knee deep	Eusebio Bernadez
4	125.431500000	9.797440000	Brgy. Macopa, San Francisco		0	No flooding	Siera Espinosa
5	125.430400000	9.742290000	Macopa, an Francisco		0	No flooding, along the baranga	
6	125.429720000	9.754540000	Honrado, San Francisco		0	No flooding, confine to the ri	
7	125.394510000	9.682760000	Jubgan, San Francisco		0	No flooding	Eulalio Lamor
8	125.395650000	9.691960000	Jubgan, San Francisco		0	No flooding	
9	125.394580000	9.707300000	Amuntay, San Francisco		1	Knee deep, flood due to landsl	Capt. Benedicto Cayasa
10	125.394740000	9.714940000	Linongganan, San Francisco		0	No flooding	
11	125.396660000	9.738760000	Balite, San Francisco		0	No flooding	
12	125.426030000	9.780120000	Top of Anao-aon bridge, Ipil, Si		0	No overflowing	
13	125.420140000	9.778160000	Municipal Hall, San Francisco		0	No flooding	Rolinic Lopez
14	125.423610000	9.783340000	Baybay, San Francisco		0	No flooding	
15	125.424060000	9.783820000	Along Anao-aon River		0	No overflow, right bank only	
16	125.422700000	9.782330000	Baybay, Poblacion, San Franci		1	Knee deep	
17	125.429980000	9.779590000	Bagong Silang, Poblacion, San		2	Waist deep	Marivic Becho
18	125.425270000	9.779310000	Bagong Silang, Poblacion, San		2	Waist deep	Ellen Princesa
19	125.422780000	9.776900000	San Francisco National High S		2	Waist deep	Dulcisima Corvera
20	125.421160000	9.775630000	Flooded area		1	Knee deep	
21	125.420330000	9.775180000	Punong, Poblacion, San Franci		1	Knee deep	Ederlina Requina
22	125.419810000	9.774040000	Katipunan, Poblacion, San Frai		1	Knee deep	Favilola Reyna
23	125.433850000	9.783520000	Alaalang, Ipil, Surigao City	5 meters	10	Flood limit	
24	125.434240000	9.769260000	Aton, Ipil, Surigao City		2	Waist deep	Gemma Ariar
25	125.433860000	9.761830000	NIA Dam Site, Aton, Ipil, Suriga	23 meters	10	Flood limit	Gemma Ariar
26	125.434230000	9.763280000	Aton, Ipil, Surigao City	25 meters	10	Flood limit	Gemma Ariar
27	125.437750000	9.756470000	Danao, Surigao City	40 meters	1	Knee deep	Honey Dina Solante
28	125.437770000	9.757060000	Danao, Surigao City	34 meters	1	Flooded area along creek, ove	
29	125.421010000	9.779120000	Poblacion, San Francisco	20 meters	0	No flooding	
30	125.439390000	9.794460000	Ipil, Surigao	11 meters	2	Waist deep	Raul Cormitar
31	125.439140000	9.794660000	Ipil, Surigao	11 meters	1	Knee deep	
32	125.437280000	9.791550000	Ipil, Surigao City	5 meters	1	Knee deep	
33	125.433380000	9.788180000	Alang-alang, Ipil	5 meters	1	Knee deep	
34	125.415990000	9.770370000	Hubas Creek, Diaz, San Franci	5 meters	1	Knee deep	
35	125.415900000	9.770380000	Diaz, San Francisco	5 meters	0	No flooding	

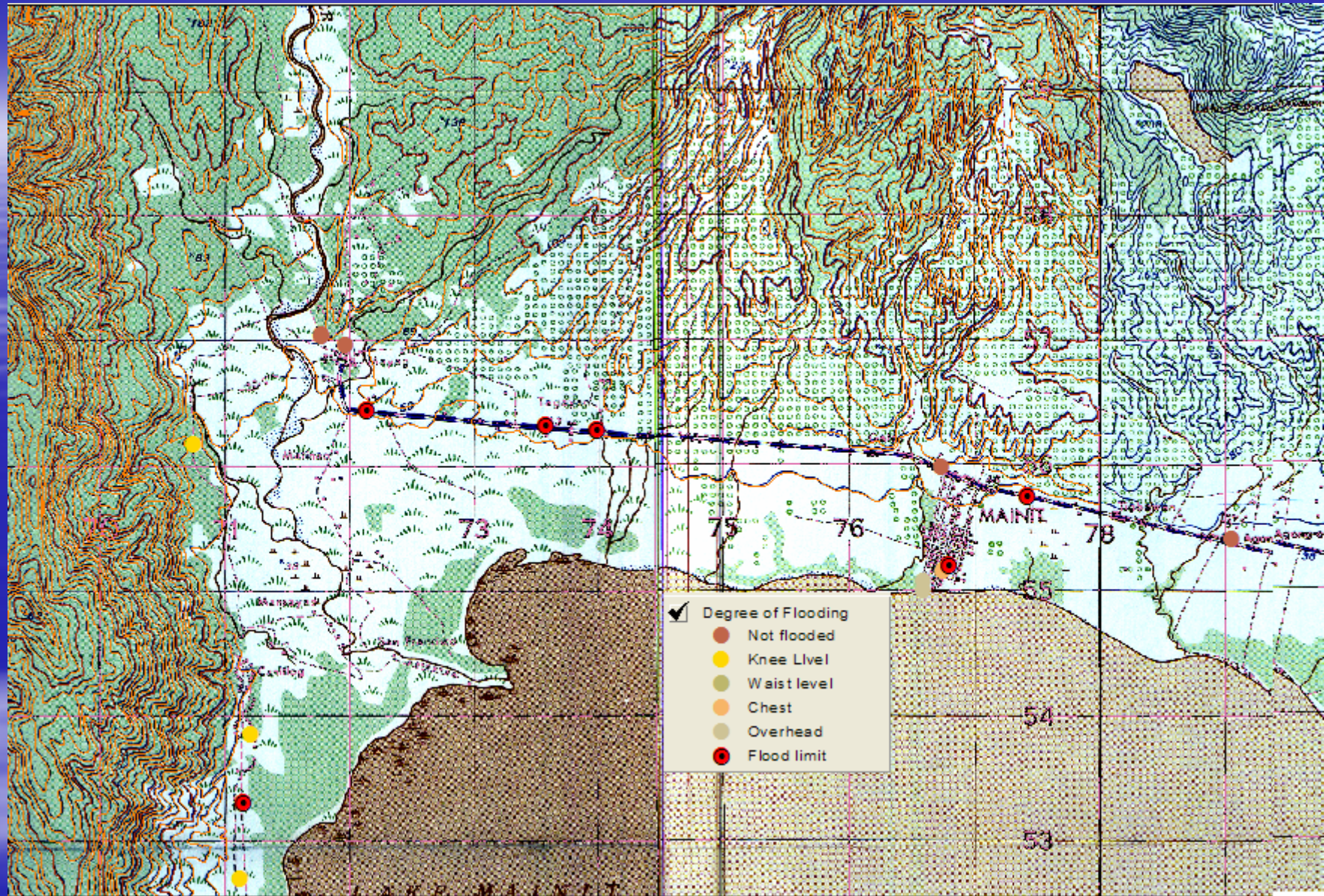
Survey Notes for San Francisco

<i>Point</i>	<i>Longitude</i>	<i>Latitude</i>	<i>Location</i>	<i>Elevation</i>	<i>Flood level</i>	<i>Remarks</i>	<i>Resource</i>
2	125.473660000	9.508920000	Basketball court, Mansayao, Mainit	53 meters	5	Overhead	
3	125.469570000	9.514900000	Mansayao, Mainit	54 meters	1	Knee deep	
4	125.469910000	9.520450000	Roadway	56 meters	10	Flood limit	Angelica Palen
5	125.470450000	9.525410000	San Francisco, Mainit	54 meters	1	Knee deep	Dominador Tandagon
6	125.466400000	9.546370000	Tulingon, Mainit	48 meters	1	Knee deep	Camilo Acedero
7	125.477610000	9.553460000	Mayag River, Matin-aw, Mainit	59 meters	0	No overflowing on top of bridge	
8	125.475810000	9.554170000	Matin-aw, Mainit	46 meters	0	No flood	Eddie Gementiza
9	125.475800000	9.554310000	Matin-aw Market, Matin-aw, Mainit	46 meters	0	No flood	
10	125.479030000	9.548800000	Roadway	56 meters	10	Flood limit	
11	125.492120000	9.547570000	Santan, San Isidro, Mainit	49 meters	10	Flood limit	Alma Fontaner
12	125.495790000	9.547240000	Santan, San Isidro, Mainit	64 meters	10	Flood limit	
13	125.520920000	9.544310000	Barangay Magsaysay, Poblacion, Tubod	61 meters	0	No flood	Rudy Dejelde
14	125.519560000	9.536130000	Barangay Quezon, Mainit	51 meters	5	Overhead	Margie Linggo
15	125.519510000	9.535500000	Lake shoreline, Mainit	43 meters	5	Overhead	
16	125.520900000	9.536840000	Barangay Quezon, Poblacion, Tubod	54 meters	3	Waist level	Joseph Alicante
17	125.521370000	9.537340000	Poblacion Mainit	49 meters	10	Flood limit	
18	125.527130000	9.542270000	Kalipayao, Magsaysay, Mainit	56 meters	10	Flood limit	
19	125.561160000	9.537200000	Magpayang, Mainit	68 meters	1	Knee deep	
20	125.563890000	9.541590000	Barangay Del Rosario, Tubod	52 meters	1	Knee deep	
21	125.567430000	9.556410000	Poblacion, Tubod	59 meters	0	No flood	
22	125.568210000	9.556030000	Poblacion, Tubod	62 meters	0	No flood	
23	125.575570000	9.552940000	Barangay Kawilan, Tubod	64 meters	1	Knee level	Rudy Suazo
24	125.575820000	9.552780000	Barangay Kawilan, Tubod	65 meters	10	Flood limit	
25	125.573580000	9.553390000	Kawilan River, Top of the bridge	59 meters	0	No overflowing on top of bridge	Alma Cobelo
26	125.572311000	9.553770000	Kawilan, Tubod	54 meters	5	Overhead	
27	125.569540000	9.555700000	Purok Silangan, Poblacion, Tubod	57 meters	1	Knee deep	
28	125.567710000	9.554550000	Police Station, Poblacion, Tubod	56 meters	0	No flood	
29	125.568010000	9.554850000	Municipal Hall, Tubod	58 meters	0	No flood	
30	125.566340000	9.553500000	National Highway, San Pablo, Tubod	56 meters	10	Flood limit	
31	125.564160000	9.552230000	National Highway, Tubod	50 meters	10	Flood limit	
32	125.542020000	9.538950000	Barangay Roxas, Mainit	59 meters	0	No flood, flood 1 km away towards	
33	125.549250000	9.537300000	Barangay Roxas, Mainit	51 meters	1	Knee deep	Pruliza Calumpag
34	125.568510000	9.542260000	Barangay Siana, Mainit	52 meters	1	Knee deep	Amansio Lincona
35	125.565500000	9.538400000	Siana, Mainit	55 meters	0	No flood, both side flooded	
36	125.564630000	9.536990000	Siana River Bridge, Siana, Mainit	58 meters	0	No overflowing	

Survey Notes for Mainit

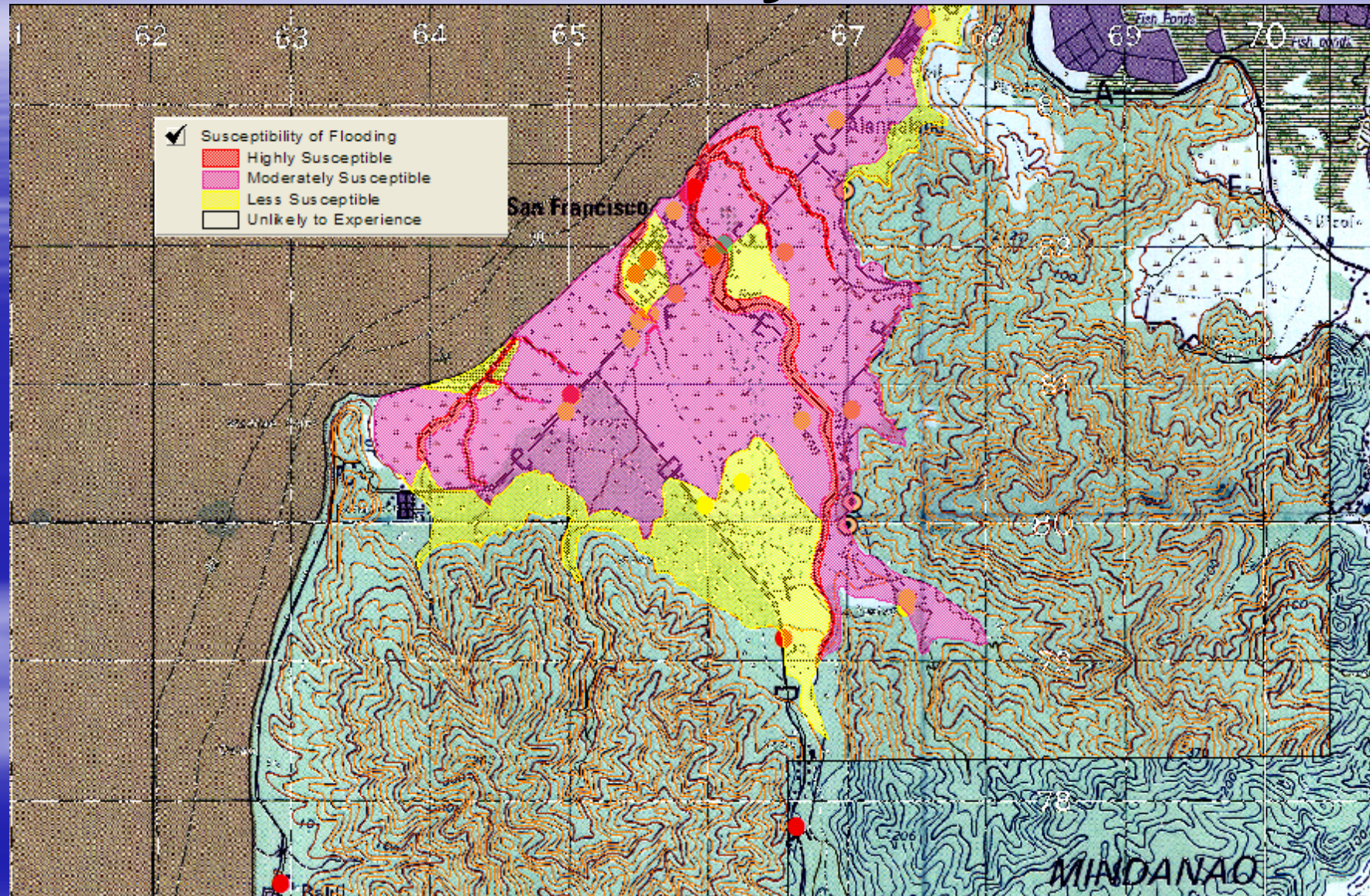


Plotted Coordinates Using GPS - San Francisco

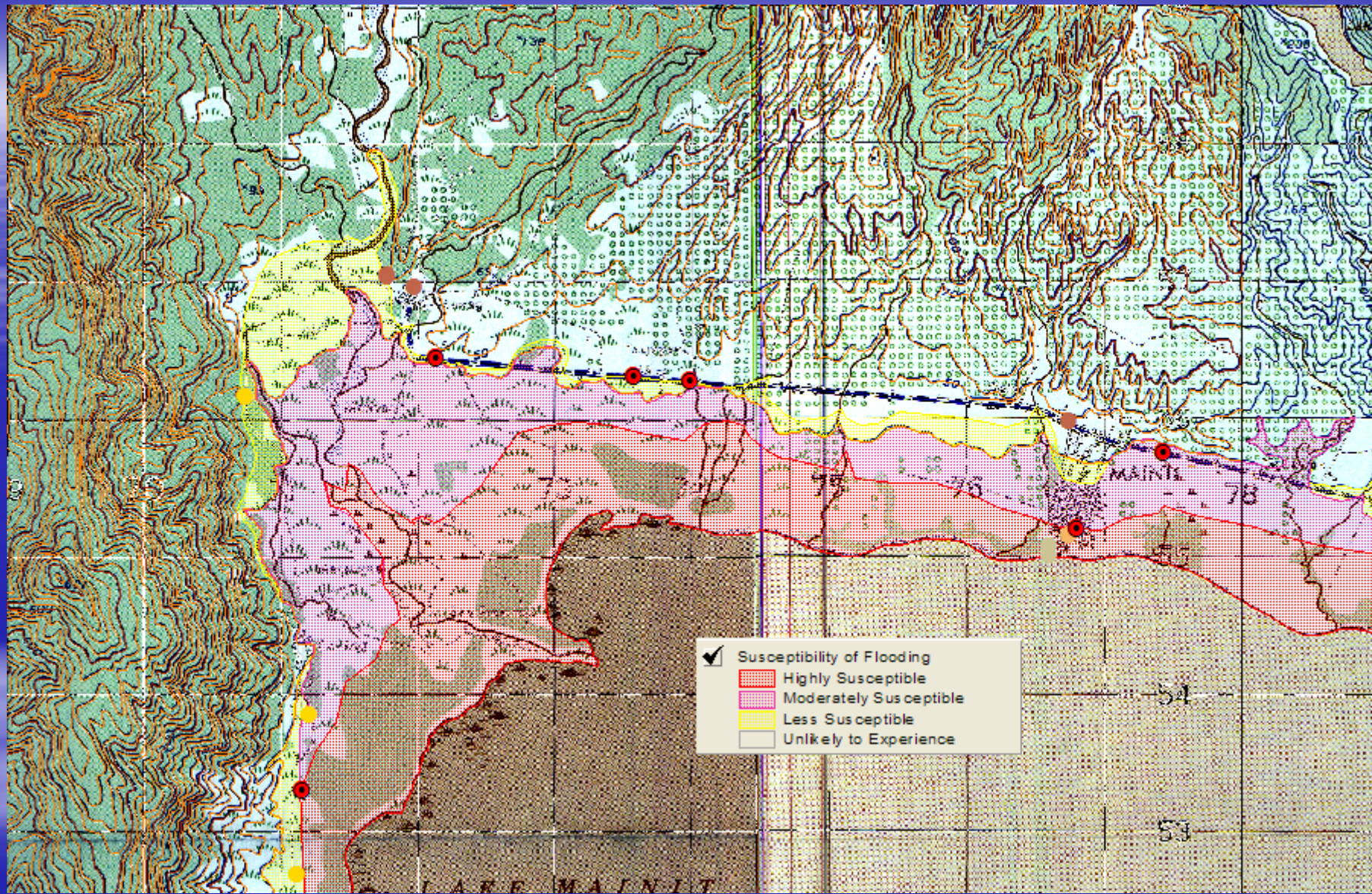


Plotted Coordinates Using GPS - Mainit

III. Analysis



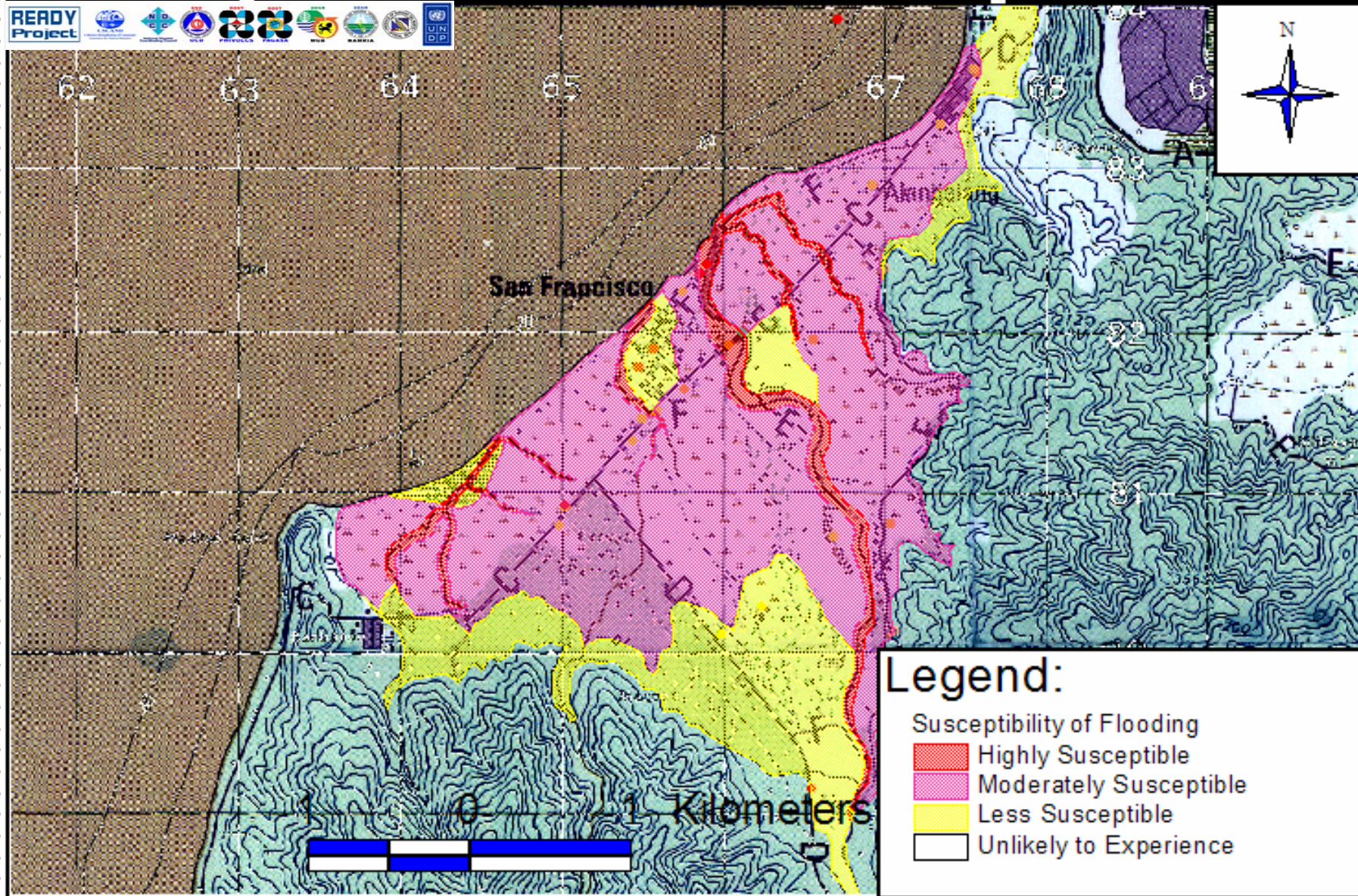
Preliminary Flood Hazard Map of San Francisco



Preliminary Flood Hazard Map of Mainit

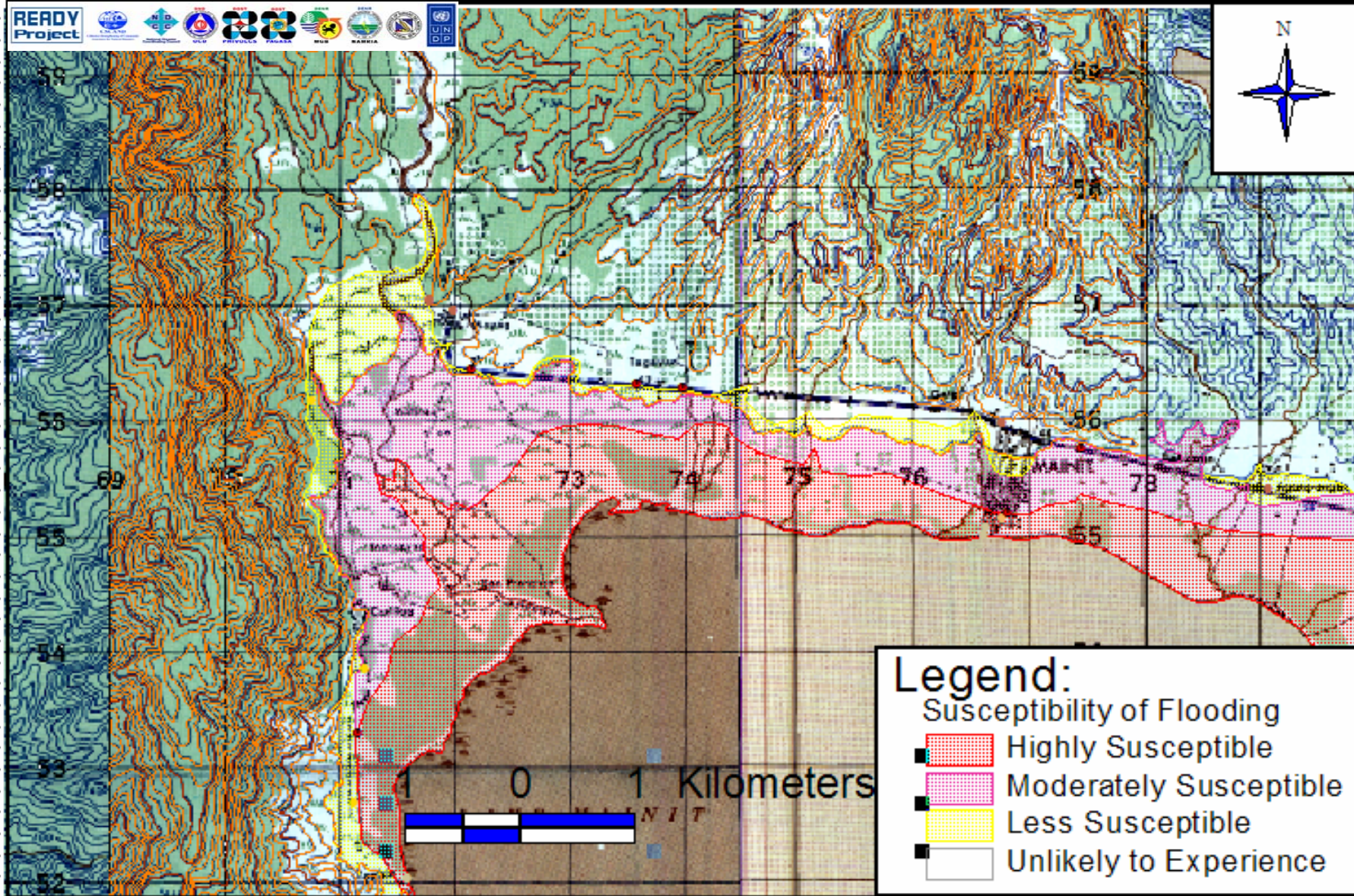
IV. Presentation of Output

Flood Hazard Map of San Francisco



- Legend:**
- Susceptibility of Flooding
 - Highly Susceptible
 - Moderately Susceptible
 - Less Susceptible
 - Unlikely to Experience

Flood Hazard Map of Lake Mainit Area



Training of Community Volunteer Observers



• More than 200 volunteer observers trained in 4 formal trainings conducted in the 2 provinces (Rainfall – water level – tide gauges / Disaster Operation Center)



DRY RUN / Operationalization of the System



- *Dry Runs conducted in 3 key areas in the 2 Provinces*



DRY RUN / Operationalization of the System



Thank you & good day....