

## The NRE-GIS Spatial Database

**Arnel B. Rala**  
**Ukrit Uparasit\***

### JUSTIFICATION

The NRE-GIS spatial database consists of a wide range of data at varying scales of representation (from country to amphoe level). These data are both spatial (i.e., geographic representation) and non-spatial (i.e., attribute data that are directly or indirectly associated with the former). It is important to note that the majority of the spatial data are in Arc/Info format, while the associated attribute data are in database format (dbf). The spatial data alone (those catalogued) occupies about 500 Mb or more of disk space. Several spatial data sets stored in tape back-ups are yet to be included (these are studies on plantations, shrimp farms, hilly lands, etc.). User interfaces have also been developed for specific use e.g., EQUIS, TNSI, HKK and TOURINFO with ARCTOUR to name a few.

Presented is a partial summary of what is readily accessible. The listing is sub-divided into levels of representation (country, regional, and provincial). Not included are the files of Mae Taeng, and Khao Yai . Currently the GIS lab is compiling data on the Mae Klong, Mekong and Chao Phraya basins, and on the Doi Inthanon and Doi Suthep-Pui National Park.

### I. COUNTRY LEVEL

Spatial data that are small in scale usually greater than 1:500,000 map scale. Data associated at this level consist of geo-political boundaries, road networks, and meteorological parameters.

<b>GEOPOLITICAL BOUNDARIES</b>	<b>DESCRIPTION</b>
National	Outline of Thailand
Region	Six geo-political regions
Province	76 provinces
Amphoe	Amphoe borders of each province
Watershed	25 major watersheds
Mapsheets	Outline of the 1:50,000 scale reference mapsheets
<b>ROAD NETWORKS</b>	
National	Primary and secondary roads. Needs updating.
Province	Various road classes link to attribute data sets pertaining to traffic, travel time, routes, vehicle capacity, etc., for each province. Needs updating.
<b>METEOROLOGY</b>	
Meteorological stations	Point feature showing location of the different meteorological stations, with links to data containing rainfall, temperature, wind, sun, and other climatic parameters.

Thiessen	Demarcates the observation range occupied by each meteorological station.
----------	---

## II. REGIONAL LEVEL

The database is limited to only two regions, the central and the Bangkok Metropolitan Region (BMR). Spatial data is between the scale of 1:250,000 and 1:500,000. However, some were captured from scales of 1:50,000 then merged together. This consists of geo-political boundaries, and road networks.

<b>GEOPOLITICAL BOUNDARIES</b>	<b>DESCRIPTION</b>
BMR	Outline of the Bangkok Metropolitan Region
Tambon	Tambon borders of BMR
Amphoe	Amphoe borders of BMR
<b>ROAD NETWORKS</b>	<b>DESCRIPTION</b>
BMR	Detailed road networks with link to traffic attributes.
Central	Road networks of the central region.

## III. PROVINCIAL LEVEL

Extensive data has been collated at this scale (1:50,000 to 1:250,000). This is where most of the projects were conducted, geared toward finding an answer, developing model(s) of the problem, testing varying scenarios, and creating interactive user interfaces. Attribute data linked with the spatial data are very detailed (though it may need updating). Examples of these are studies conducted for Samut Prakarn, Phrae and Uthai Thani. The level of detail varies by study, although most are not as detailed as the Phuket study, which is described below.

<b>UTHAI THANI*</b>	<b>DESCRIPTION</b>
Boundary	Provincial outline
Tambon	Tambon border
Amphoe	Amphoe border
Factory	Location of industrial factories surveyed using GPS
Khlongs	Drainage system or river networks (major and tributaries)
Landuse	Different landuse classes (1969 and 1984)
Villages	Village location
Roads	Road networks
Places	Important spots such as Wats, tourist areas, etc.
Urban	City cadastral plan (present and future)
Rainfall	Rainfall distribution
Forest	Forest class
Elevation	Elevation ranges generated from TIN
Mines	Mining sites
Buffer	Buffer zone between the national park and the rest of the province
Habitat	Habitat boundary of peafowl, tapir, elephant, langur, gaur, pheasant, hornbill, banteng, chicken, deer and khwai

\*

*Each set of spatial data was created from 17 mapsheets with the scale of 1:50,000 and from surveys conducted using GPS. A user interface module through Arcview was developed for presentation, query*

and analysis.

<b>SAMUT PRAKARN *</b>	<b>DESCRIPTION</b>
Boundary	Provincial outline
Tambon	Tambon border
Amphoe	Amphoe border
Factory	Location of industrial factories surveyed using GPS
Khlongs	Drainage system or river networks (major and tributaries)
Landuse	Different landuse classes (1982, 1987, and 1989)
Villages	Village location
Roads	Road networks
Soil	Soil classification
Urban	City cadastral plan (present and future)
Rainfall	Rainfall distribution
BOD	Dissolved biological oxygen distribution
Hazardous waste	Point and non-point sources

\* *The Environmental Quality Information System (EQUIS) currently houses all of the data presented above. It is an interactive user interface that provides simple query to complex simulation models.*

<b>PHUKET ISLAND*</b>	<b>DESCRIPTION</b>
Boundary	Provincial outline
Tambon	Tambon border, however, names are yet to be encoded.
Amphoe	Amphoe border
Khlongs	Drainage system or river network (major and tributaries)
Roads	Road networks for the island (both major and minor roads). Detailed representation of the Phuket municipal is also included.
Places	Locations of hotels, commercial complexes, government agencies, Wats, etc.
Urban	City cadastral plan
Rainfall	Rainfall distribution
Hydrogeology	Hydrogeological formation
Elevation	Elevation ranges generated from TIN
Mines	Mining sites
Slope	Slope class generated from TIN
TIN	Triangulated irregular network built from contour lines
Contour	Contour line with 20 m. interval including spot and horizontal elevation points
Well	Location of drilled and dug wells of the DMR
Water level	Contour lines depicting levels of ground water
Depth	Depth of ground water
Shallow water level	Range of water levels
Watershed	Border of watersheds
Water Pit	Location of water pits
Aquifers	Scope of alluvial and colluvial aquifers

\* Each set of spatial data was created from 17 mapsheets with the scale of 1:50,000 and from surveys conducted using GPS. A user interface module through Arcview was developed for presentation, query and analysis.

PHRAE*	DESCRIPTION
Boundary	Provincial outline
Tambon	Tambon border
Amphoe	Amphoe border
Elevation	Elevation model generated from TIN at 100 m. interval
Slope	Slope model generated from TIN
Contour	Contour lines at 100 m. interval with spot and horizontal elevation points
Forest	Forest types
Khlongs	Drainage system or river networks (major and tributaries)
Landuse	Different landuse classes
Villages	Village location
Roads	Road networks
Watershed	Watershed classes
Landmarks/places	Important places such as Wats, mine sites, etc.
Geology	Geological formations
Hydrogeology	Hydrogeological formations
TIN	Triangulated irregular network generated from contours for surface analysis
Wells	Location of drilled/dug water wells
Urban	City cadastral plan, although not classified

\* Each set of spatial data was created from 19 mapsheets with the scale of 1:50,000.

### **CONTACT INFORMATION**

It is the intention of the GIS Lab to make these data available to the public for a price to cover the cost of maintenance and storage. Pricing will depend on the level of representation (scale) and on the quality and quantity of data.

For more information, please contact the Natural Resources and Environment Program, Thailand Development Research Institute for Arnel B. Rala or Ukrit Uparasit at email: [tong@tdri.or.th](mailto:tong@tdri.or.th); Phone: (662)718-5460 ext. 426; Fax: (662) 718-5461-2.

© Copyright 1996 *Thailand Development Research Institute*