# UNGGIM - ISPRS Activity to survey the current status of mapping and map updating in the world

ProgressReport

by

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#### 1. UN-Secretariat-Laval University 1987

before 1986 Laval University offered to the UN Secretariate to make a study on the state of mapping in the world; this study was carried out with the UN Secretariat and published at the UN Cartographic Conferece in Bangkok 1987; it reflected the situation of 1980 with some updates

The result was, that the land areas of the globe were basically covered with maps at the scale 1:250 000, 2/3 was covered at 1:50 000 and 1/3 at 1: 25 000, larger scales were not mentioned

Alarming was the poor update rate for world mapping (e.g. for 1:50 000 at 48 years as world average)

Department of Technical Co-operation for Development

# ELEVENTH UNITED NATIONS REGIONAL CARTOGRAPHIC CONFERENCE FOR ASIA AND THE PACIFIC

Bangkok, 5-16 January 1987

Vol. I.-Report of the Conference



#### STATUS OF WORLD TOPOGRAPHIC AND CADASTRAL MAPPING

Paper submitted by the Secretariat\*

#### RÉSUMÉ

Le Département de la coopération technique pour le développement de l'Organisation des Nations Unies procède régulièrement, tous les six ans (1968, 1974 et 1980), par l'intermédiaire du Groupe de la cartographie de la Division des ressources naturelles et de l'énergie, à des enquêtes sur la cartographie topographique et sur la cartographie cadastrale dans le monde (1980)

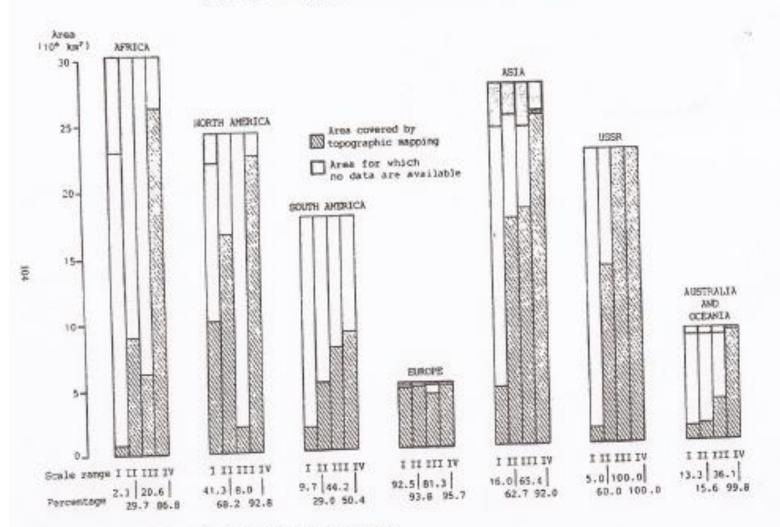
Les données présentées dans le présent document sont fondées sur les résultats de l'enquête de 1980 mais ont été mises à jour, dans la mesure du possible, jusqu'au milieu de 1986 à partir d'informations récentes contenues dans la banque de données du Département de cartographie de l'Université Laval II y a lieu toutefois de préciser que cette mise à jour de l'enquête de 1980 ne saurait être considérée comme remplaçant la nouvelle enquête de 1986 pour laquelle les données seront tirées des réponses aux questionnaires officiels envoyés par l'Organisation des Nations Unies au début de 1986.

<sup>\*</sup> The original text of this paper, prepared by A J Brandenberger and S K Ghosh, professors of Photogrammetry. Faculty of Forestry and Geodesy, Laval University, Quebec, Canada, appeared as document Et CONF 78/BP 7

TABLE 38. STATUS OF WORLD TORDERAPRIC HAPPING: AFRECA Area covered on each scale range, spidward 1980 Sarver

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Graph L. Area covered by topographic mapping on four scale ranges, by prographical region, mid-1856



None: Personages radicase the rates of the area mapped to the sate concred by the study.

Table 1: Status of World Mapping 1987

Scale range	1:25,000	1:50,000	1:100,000	1:200,000
Africa	2.9 %	41.4 %	21.7 %	89.1%
Asia	15.2 %	84 %	56.4 %	100 %
Australia and Oceania	18.3 %	24,3 %	54.4 %	100 %
Europe	86.9 %	96.2 %	87.5 %	90.9 %
Former USSR	100 %	100 %	100 %	100 %
North America	54.1 %	77.7 %	37.3 %	99.2 %
South America	7 %	33 %	57.9 %	84.4 %
World	33.5 %	65.6 %	55.7 %	95.1 %

## Status of Topographic Mapping 1987

1:25 000 green, 1:50 000 yellow

1:100 000 violet, 1:200 000 red

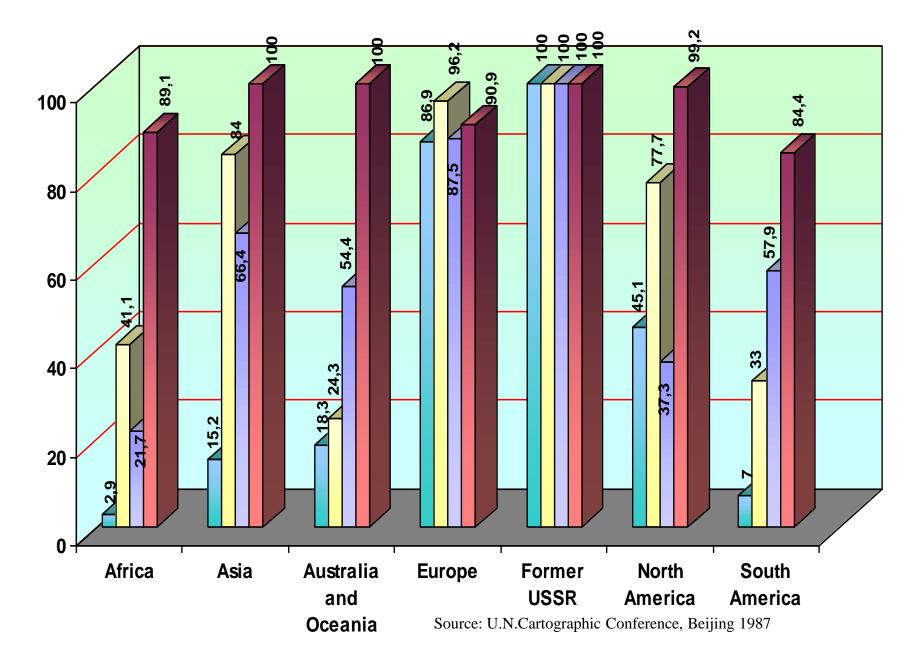
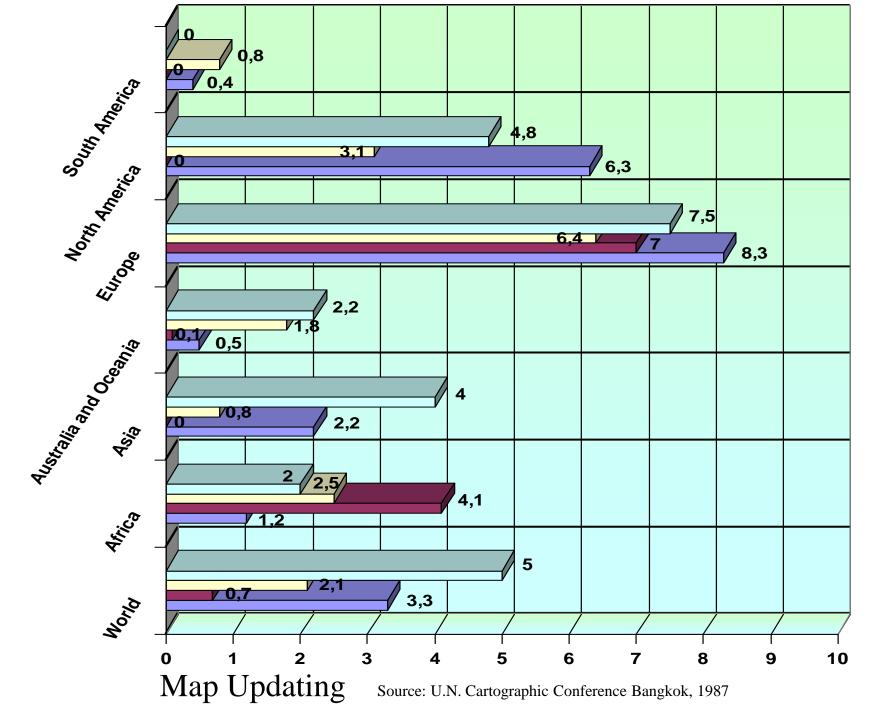


Table 1.2: Update Rates of World Mapping

Scale range	1:25,000	1:50,000	1:100,000	1:200,000
Africa	1.7%	2.2 %	3.6 %	1.4%
Asia	4.0 %	2.7 %	0.0 %	1.9 %
Australia and Oceania	0 %	0.8 %	0 %	0.3 %
Europe	6.6 %	5.7 %	7.0 %	7.5 %
Former USSR	0 %	0 %	0 %	0%
North America	4.0%	2.7%	0.0 %	6.5 %
South America	0 %	0.1 %	0 %	0.3 %
World	5.0 %	2.3 %	0.7 %	3.4 %



- 2. The UN Cartographic Conferences have subsequently passed a number of resolutions to update this effort within existing facilities, but until 2011 there was no progress
- 3. at the ISPRS Workshop in Guilin 2011 a number of participants decided to approach ISPRS Council to undertake the effort and to approach the UN Statistic Division for Cooperation.

Secretary General of ISPRS Chen Jun obtained ISPRS Council approval

Subsequently Dr. Paul Cheung, Director of the UN Statistics Division was approached. He approved favourably to undertake the study within the Group of Experts of Global Geographic Information Management

4. Design of a Questionnaire to the National Mapping Agencies of the UN Member Countries

The Questionnaire was drafted at the Institute for Photogrammetry and Geoinformation of Leibniz University Hannover with reviews

- by the Mapping Organization of the State of Lower Saxony
  - by the National Geomatics Center of China
  - by Euro SDR (the European Research Organization of Geoinformatics)
  - by the South East European Geoinformatics Organization
- 5. Major Review by UN GGIM Dr. Amor Laaribi
- 6. Translation of reviewed Questionnaire by members of BEV Germany into French, Spanish and Russian and mailing to UN Member Countries NMA's by UN GGIM

7. Mailing of Questionnaire to U.N.Member States by UNGGIM by April 5, 2012

## Suggested Work Plan for the Task to Determine the Current Status of Mapping and Updating the World

Ψ.				
	no.	<u>task</u>	responsibility	<u>time</u>
	1	Design of questionnaire	G. Konecny & E. Jaeger,	till Jan 20, 2012
			Hannover	
	2	- Verification of questionnaire	C. Heipke & K. Mooney,	till February 20, 2012
		- with EuroSDR	EuroSDR	
		- with ISPRS Secretariat	- Chen Jun, ISPRS &	till February 20, 2012
			Ms Shang Yaoling &	
			Dr. Zhao Renliang	
	3	Submission to UN Secretariat	- G. Konecny, Hannover	till March 1, 2012
		and GGIM Committee	to	
		Bureau	A. <u>Laaribi</u> , UN	
	4	Contact to private enterprises	G. Konecny	till April 1, 2012
		with request for cooperation:		
		- Google		
		<ul> <li>Microsoft</li> </ul>		
		- Navtec		
		- Tomtom		
		- ESRI		
	5	Compilation of addresses and	A. Laaribi, UN-GGIM	till April 1 Mail by
		mailing		<u>April 5</u> , 2012
11				

6	Receipt of answers by UN- GGIM	A. Laaribi	till July Responses by June 1-4, 2012
7	Transmission of received data	A. Laaribi to G. Koneeny	ByJuly June 15, 2012
8	Review by ISPRS Secretariat	- Chen Jun, ISPRS & Ms Shang Yaoling & Dr. Zhao Renliang	By August June 291, 2012
9	Preparation of interim report to UN-GGIM	G. Konecny	By July 27 August 10, 2012
10	Interim presentation UN- GGIM in New York	G. Konecny	August 13-15, 2012
11	Interim presentation at ISPRS Congress, Melbourne & solicitation for missing answers		
12	Evaluation & analysis with followintg of missing information	G. Konecny	October 1, 2012

13	Design of a cadastral mapping questionnaire	G. Konecny & E. Jaeger	November 1, 2012
14	Review of comprehensive cadastral questionnaire by EuroSDR	C. Heipke & K. Mooney	till January 1, 2013
15	Submission to UN-GGIM	G. Konecny to A. Laaribi	till January 15, 2013
16	Mailing of comprehensive cadastral questionnaires	A. Laaribi, UN-GGIM	till March 1, 2013
17	Receipt of answers by UN-	A. Laaribi, UN-GGIM	till June 1, 2013

	GGIM		
18	Transmission of received data	A. Laaribi to G. Koneeny	till June 15, 2013
19	Analysis		till August 1, 2013
20	Compilation of Final Report		till November 1, 2013

#### National Topographic Mapping Coverage

 At what scales are topographic digital data and/or map products (or series) produced and maintained? Choose the categories closest to your scales if they are different to those suggested below.

```
Category: I
                      1: 1000 or greater
                      1:5000
          II
                      1:25 000
          III
                      1:50 000
          IV
          V
                      1.100 000
          \widetilde{\Lambda}
                   1:250 000
          VII
                     1.500 000
                      1:1 million or smaller
          VIII
```

In each case indicate the reference datum used.

If possible, provide indexes that show the coverage of these data and/or maps by category in graphic form (see model illustration and provide map or shape file).

If possible, distinguish between the age of available maps and/or data (e.g. 1yr, 2yrs, 3yrs, 4 to 7yrs, 8 to 15yrs, over 15yrs), state the year of publication 1

<sup>&</sup>lt;sup>1</sup> Even if we know that this is incredibly difficult to do so for the digital data.

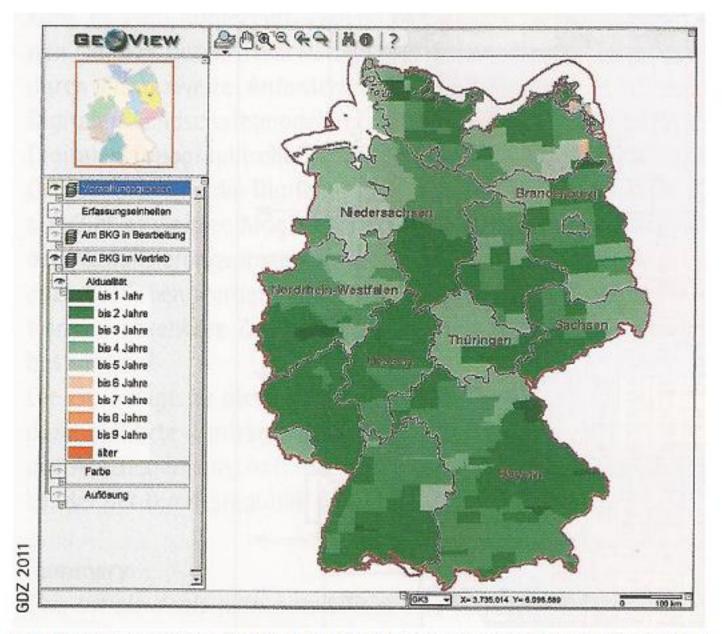


Fig. 1: Coverage of Topographic database ATKIS in Germany in the old (non-integrated) data model with currency from 1 to 10 years

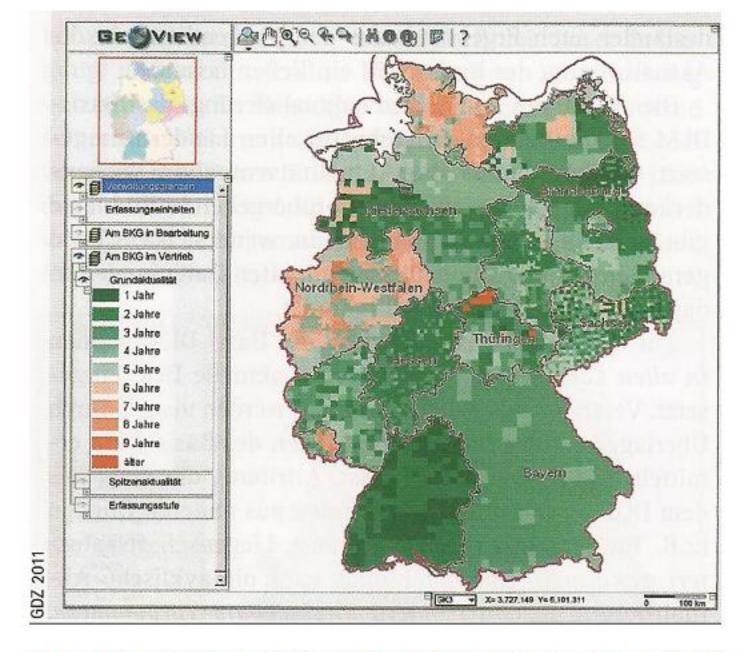


Fig. 2: Coverage of Topographic database ATKIS in Germany in the new (AAA-integrated) data model with currency of 1 to 7 years

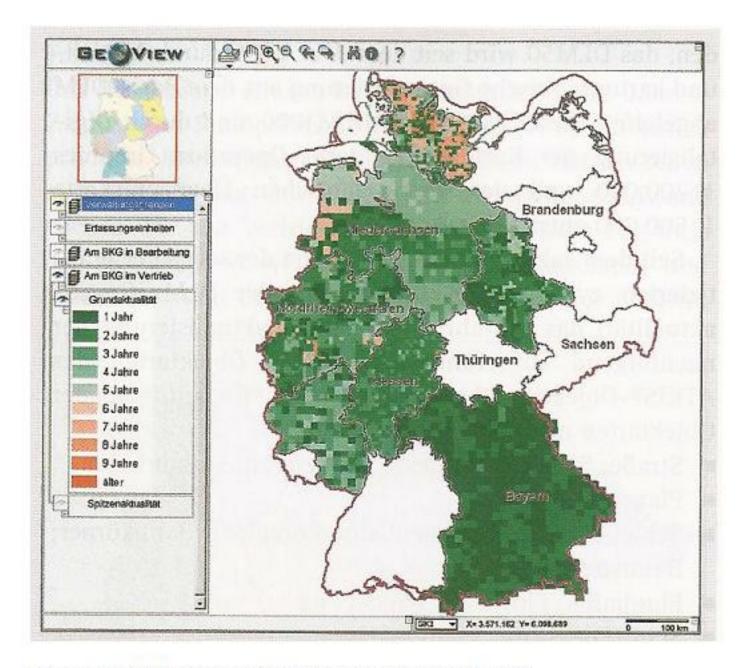


Fig. 3: Digital orthophotos 1:5000 in Germany (ages 1 to 6 years)

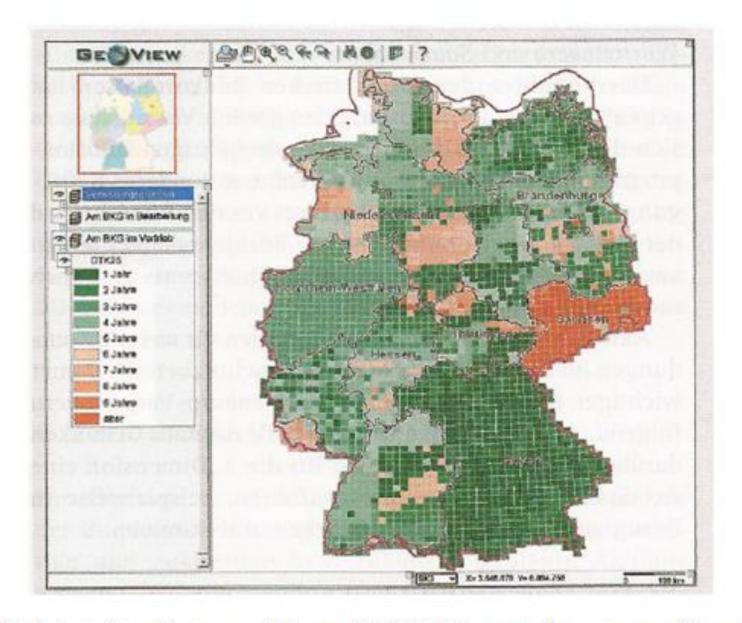


Fig. 4: Actuality of the topographic map 1:25 000 in Germany (1 year to over 10 years)

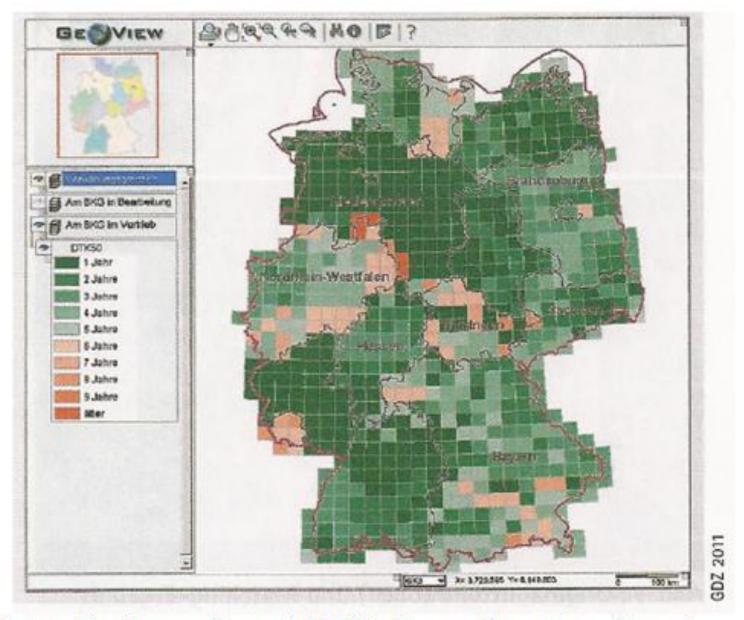


Fig. 5: Actuality of topographic map 1:50 000 in Germany (1 year to over 10 years)

- 3. Do the maps and/or data have restricted access or limited circulation? If so, can you indicate why and to whom?
- 4. Are the maps and/or digital data sold to the public, or are they free of charge? Are they free of charge to governmental institutions or certain stakeholders? What maps or data are available on the web, and are they free? If applicable, could you indicate what pricing model is being applied to the map products and the digital data?
- 5. Is there a cycle of map and data revision by:

Complete mapping ie. revision of a national series

Mapping of changed features or themes across the national series

Mapping of changed features as they are detected on an ad-hoc basis

Is the data revision reflected across all map/data scales indicated in Question 1? If not, state the revision cycle for each map and/or data scale

6. By what methods is national data revision and map updating undertaken (if multiple methods, please indicate):

Field surveys

Aerial photography

Photogrammetric Mapping

Satellite imagery

Third party data and/or sources

Crowd sourcing by volunteers and/or other means

If there is a prevalent method of mapping by category I to VIII for each map scale, please indicate for each.

7. Is mapping and map updating done in-house or by outsourcing?

Where applicable, can you describe the activities, processes and mechanisms by which the outsourcing is conducted?

## Questionnaire

#### National Imagery Acquisition

- 8. Does a national aerial photography acquisition program exist? Do you have a domestic aerial imagery capability, or is it obtained internationally? Is imagery flown at regular time intervals? Is analogue or digital photography used?
- 9. Does a national satellite imagery acquisition program exist? Do you have a domestic satellite imagery capability, or is it obtained internationally? Is satellite imagery acquired systematically at regular time intervals? Or is satellite imagery acquired on an 'as needs' basis?

- Do you acquire and/or use other imagery types (such as LiDAR, Radar, IFSAR, etc.)? If so, can you please indicate coverage and resolution? (For example: LiDAR along the coastal strip at 15cm pixel resolution).
- 11. Are any of these new imagery acquisition types (such as LiDAR) being used for the generation of digital elevation models (DEMs), digital terrain models (DTMs), and/or digital surface models (DSMs)? State pts/m² and the coverage in km² if possible.
- 12. Are orthophotos and orthophotomaps produced? At what scale? If possible, show coverage and age at different scales in graphical form.
- Is there a national digital elevation model (DEM) available?
   If applicable, show the resolution and coverage of any sub-national DEM, DTM and DSM data and/or products.
- 14. Do you produce, or is there the intention to produce, 3D urban and rural landscape models and/or product visualization?

#### National Surveying and Cadastral Coverage

- 15. Are there licensed surveyors operating in the country?
- 16. Is there national coverage of cadastral maps and/or data available? Is the National Mapping Agency (NMA) responsible for surveying and/or land titles and cadastre? If the NMA is not responsible for these, please indicate the relevant agency/s that are responsible.
- 17. What are the cadastral maps and data used for:

Land registration

Titles.

Conveyancing

Taxation

- 18. Are the cadastral maps based on geodetic control, and if so which reference system is being used?
- 19. Are the property boundaries monumented in the field?
- 20. How are the property maps and/or data updated?
- 21. Could you list the number of government officials and private surveyors active in cadastral surveys?

## **Questionnaire**

#### Organisation

- 22. Are the national topographic mapping, imagery acquisition, surveying and cadastral programs funded by your national Government?
- 23. Are you able to provide the annual mapping budget of the National Mapping Organization?
- 24. What is the number of mapping staff in the Organization, and what is the technical/administration mix?
- 25. Are there any regulatory or institutional arrangements in place that mandates your organization to fulfil the role as the lead mapping agency in your country? If so, could you briefly describe them?
- 26. In terms of approximate percentages (%) how are all of the different map and data products mentioned above delivered? Consider the following channels:

Hard copy paper maps

Digital data

Data and products downloaded online

Via web services

27. What is the method of archival for the national data sets?

## French Translation by Dr. Klaus Komp, edited by Amor Laaribi

Draft Questionnaire

0. Identification of the ar	nswering Institution	0. Identification de l'Institution répondante	
Country:		Pays:	
Official Title:		Titre officiel:	
Department:		Département :	
Postal Address:		Adresse postale :	
Internet site:		Site internet :	
Phone:		Téléphone :	
Fax:		Fax:	
Name and Position of the	Person answering:	Nom et position de la personne qui a rempli le questionnaire:	
	_		
E-Mail:		E-Mail:	
		***************************************	
National Topographic Mapping Coverage		Couverture nationale de la Cartographie Topographique	
		9	
	o ographic digital data and/or map products (or		
/ -	maintained? Choose the categories closest to	numériques de la topographique ou <del>des <u>les</u> p</del> roduits	
	e different to those suggested below.	cartographiques (ou des séries)? Veuillez choisir les catégories les	
Category: I	1: 1000 or greater	plus proches au cas où elles sont différentes de celles proposées au	
II	1:5000	<u>ci-</u> dessous <u>.</u>	
III	1: 25 000	Catégorie: I 1: 1000e ou plus grand	
IV	1: 50 000	II 1:5000e	
V	1:100 000	III 1:25 000°	
<u>VI</u>	1:250 000	IV 1:50 000°	
VII	1:500 000	V 1:100 000°	
VIII	1:1 million or smaller	VI 1:250 000€	
		VII 1:500 000€	
In each case indicate	the reference datum used.	VIII 1:1,000 000° ou plus petit	
		Veuillez indiquer pour chaque cas le système de référence utilisé.	

#### Анкетный опрос проекта

#### Обзор национальных топографических карт

 В каком масштабе имеются топографические цифровые данные и/или произведенные и поддерживаемые аналоговые карты или серии карт? Выберите категории, самые близкие к вашему масштабу, если они отличаются от приведенных ниже,

Категории: I 1: 1000 или крупнее

II 1: 5000

III 1: 25 000

IV 1: 50 000

V 1: 100 000

VI 1: 250 000

VII 1: 500 000

VII 1: 500 000

VIII 1: 1 миллион или мелкомасштабнее

В каждом случае указывать используемую систему координат.

 Если возможно, укажите индексы, которые показывают объем этих данных и/ли категории карт в графической форме (см. образец иллюстрации и создайте карту или shape файл).

Если возможно, укажите различный срок давностти (старость) доступных карт и/или данных (например: 1г., 2г., 3г., от 4 до 7лет., от 8 до 15лет., больше15 лет), сообщите год изготовления<sup>1</sup>

- Имеют ли эти карты и/или данные ограниченный доступ или ограниченное обращение? Если так, Вы можете указать, почему и кому?
- Выставляются ли карты и/или цифровые данные, для продажи публике, или они бесплатны?

Они бесплатны для правительственных учреждений или для определенных действующих партий?

Какие карты или данные являются доступными в сети, и они бесплатны? Если доступны, Вы могли бы указать, какая модель цен применяется к продуктам карт и цифровым данным?

# Russian Translation by Dr. Gernod Schindler

#### Borrador de cuestionario

#### Cobertura Nacional de Cartografía topográfica

1. ¿A qué escalas están los datos topográficos digitales y / o productos de mapa (o serie) creados y mantenidos? Elegir las categorías más cercanas a sus escalas si son diferentes a los sugeridos a continuación.

Categoría: I 1: 1000 o más

II 1: 5000

III 1: 25 000

IV 1: 50 000

V 1:100 000

VI 1:250 000

VII 1:500 000

VIII 1:1 millón o más pequeño

En cada caso indicar el dato de referencia utilizado.

 Si es posible, adjunta los índices que muestran la cobertura de estos datos o mapas por categoría, en forma gráfica (vea la ilustración modelo y proporcionar mapa o archivo de forma).

Si es posible, distinguir entre la edad de los mapas disponibles y / o datos (por ejemplo 1 año, 2 años, 3 años, 4 a 7años, 8 a 15años, 15 años más); por favor, indica el año de publicación.

- 3. ¿Los mapas y / o de datos tienen acceso restringido o circulación restringida? Si es así, ¿puede indicar por qué y para quién?
- 4. ¿Se vende los mapas y / o datos digitales al público, o son de forma gratuita? ¿Son de forma gratuita a instituciones gubernamentales o grupos de interés determinados? ¿Qué mapas o datos están disponibles en la web, y son gratuitos ¿Podría indicar qué modelo de precios se aplica a los productos de mapas y los datos digitales?

Spanish
Translation
by Conrad
Count Hoyos

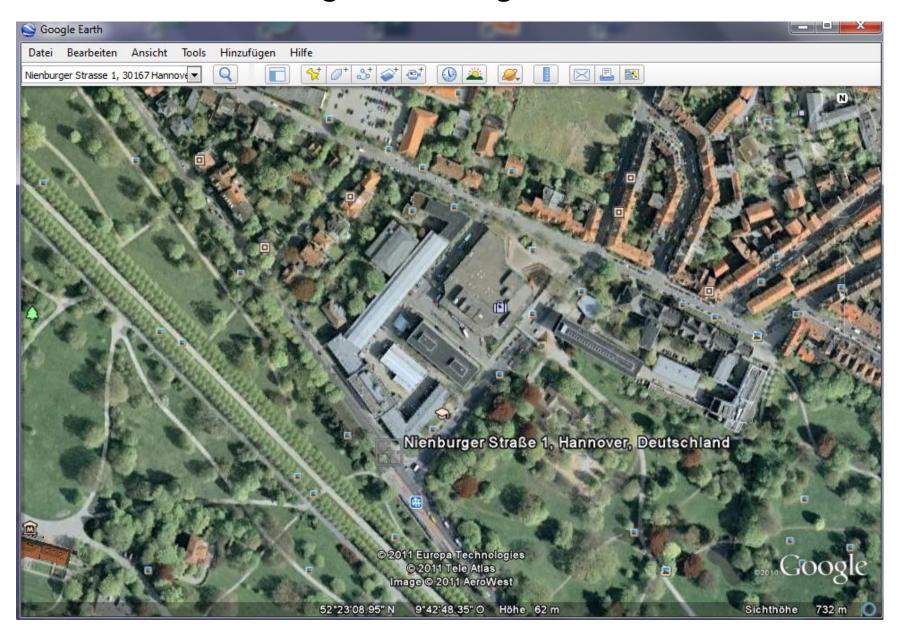
#### In addition to NMA's

there are commercial actors engaged in mapping, in whole or in part, such as

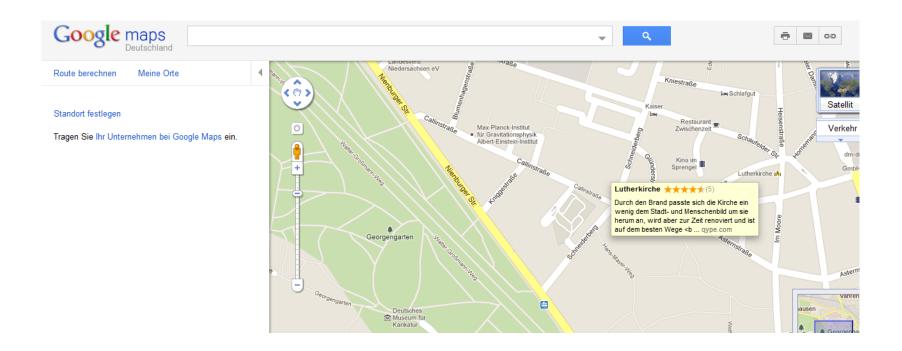
- Google (Google Earth, Google Maps, Google StreetView)
- Microsoft (Bingmaps)
- Navteq
- TomTom

Contacts have been established, but it will be difficult to obtain complete information from them according to the questionnaire. But they have been asked to suggest ways how their mapping contribution in support of the official mapping and map updating efforts of the national mapping agencies can best be described

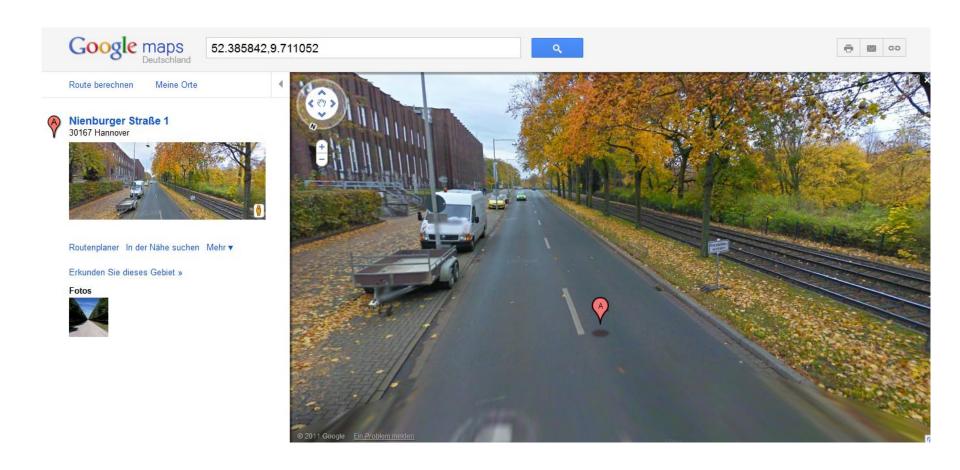
#### **Google Earth Images**



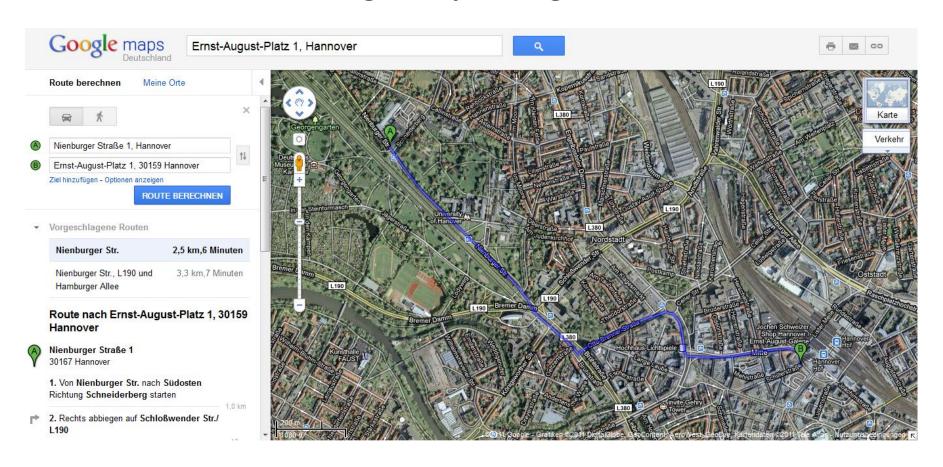
### **Google Maps and Address Search**



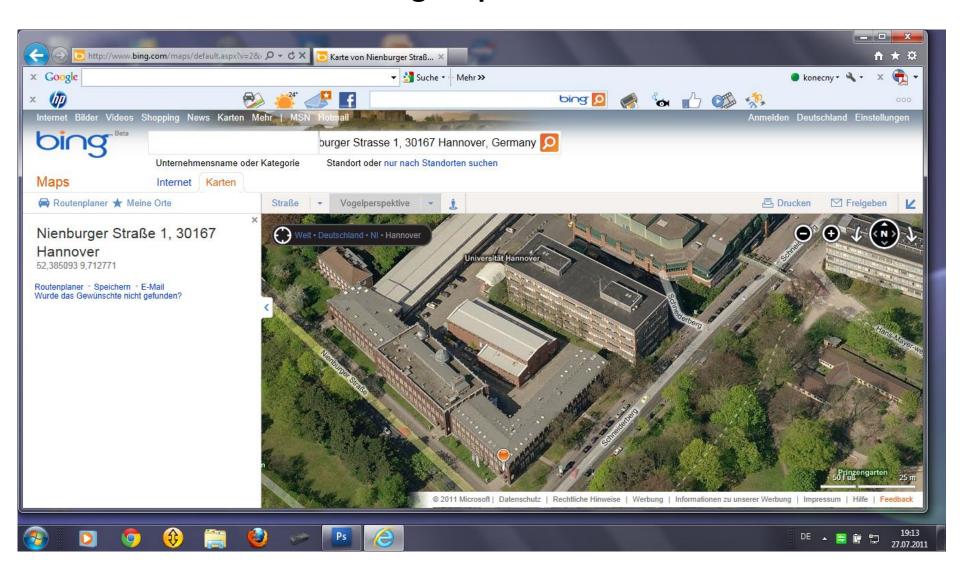
#### **Google Street View**



#### **Google Maps Navigation**



## **Bing Maps 3D View**



There are furthermore a number of international data providers for the digital age, such as:

- Eastview Geospatial, Minneapolis, MN, USA
- ESRI, Redlands, CA, USA
- ILS Scientific Cartography, Stuttgart, Germany
- WorldMap, Harvard University, Center of Geographic Analysis, Boston, USA

They have been informed about the project, requesting their possible support

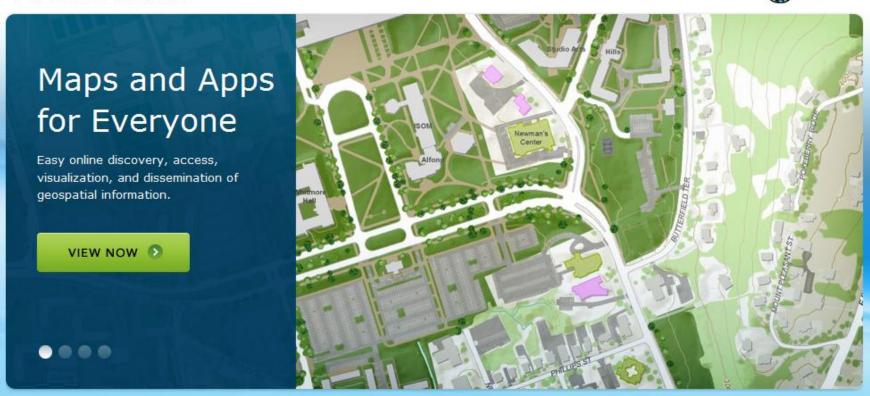
## The availability of digital map data determines the use of GIS

Resource Center Show: Web Content Only ▼ Help ▼ Sign In

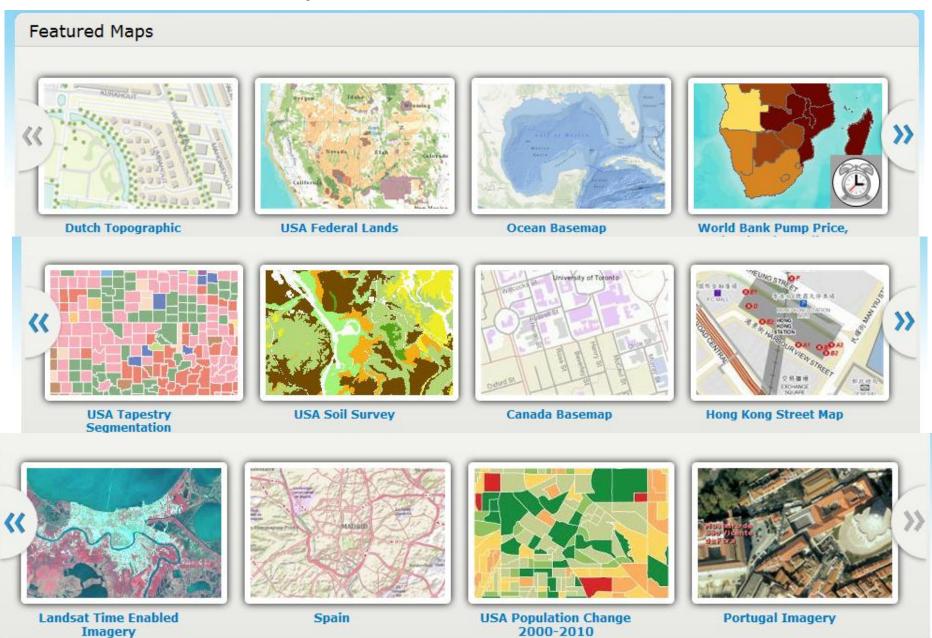
ArcGIS GALLERY MAP GROUPS MY CONTENT Find maps, applications and more... Q

### ArcGIS Online





## **Downloadable Map Data for ESRI's ArcGIS**



## In addition to NMA's

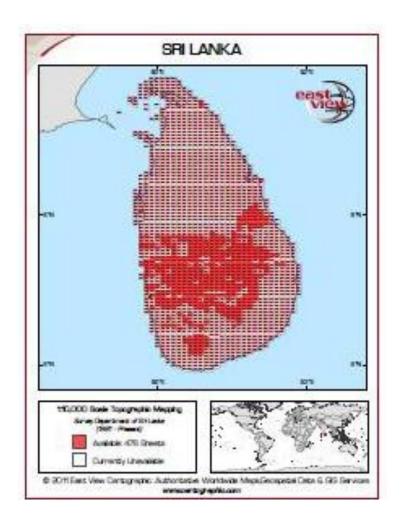
There are international map vendors, such as:

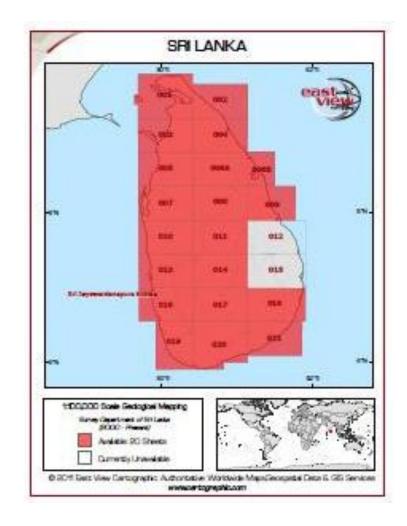
**East View Cartographic – East View Geospatial** 

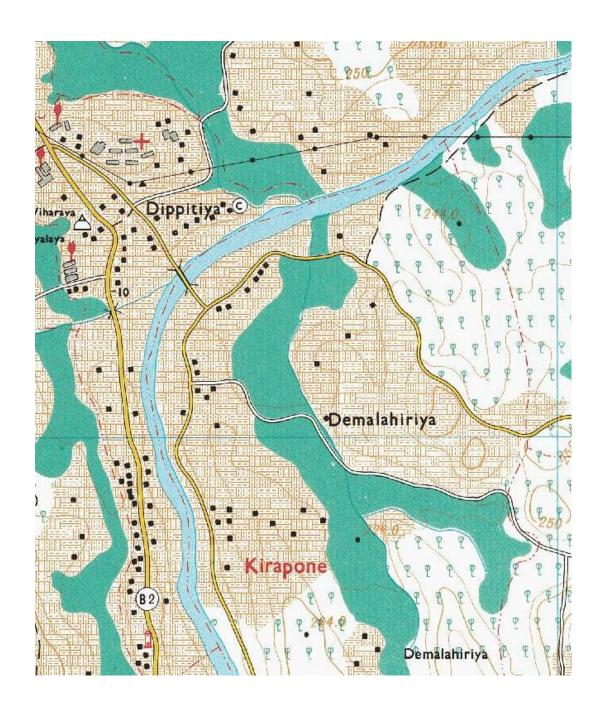
These contacts could be used to verify the information officially supplied or to fill in missing data?

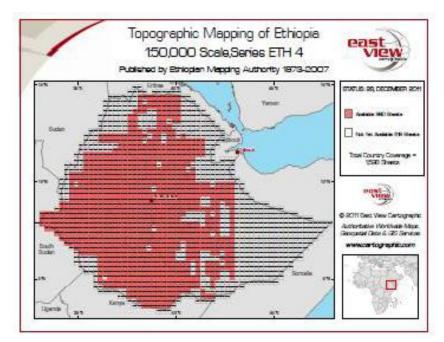
Some samples of materials are shown, which e.g. Eastview Cartographic may provide:

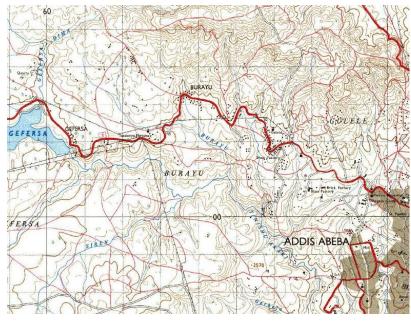
- Maps of Sri Lanka
- Maps of Ethiopia
- Maps of North Korea
- Maps of Hungary

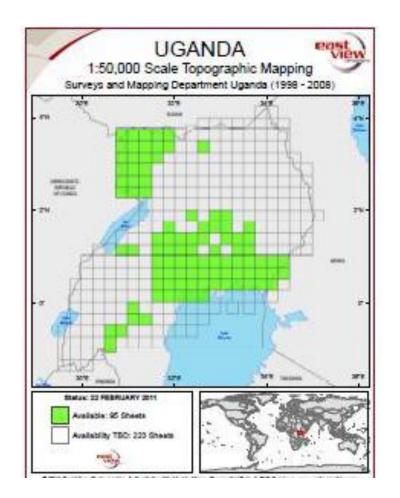


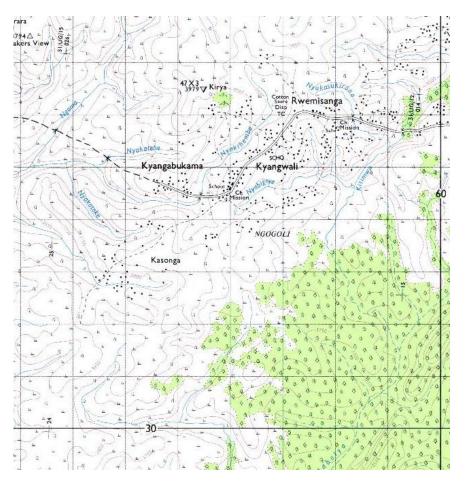


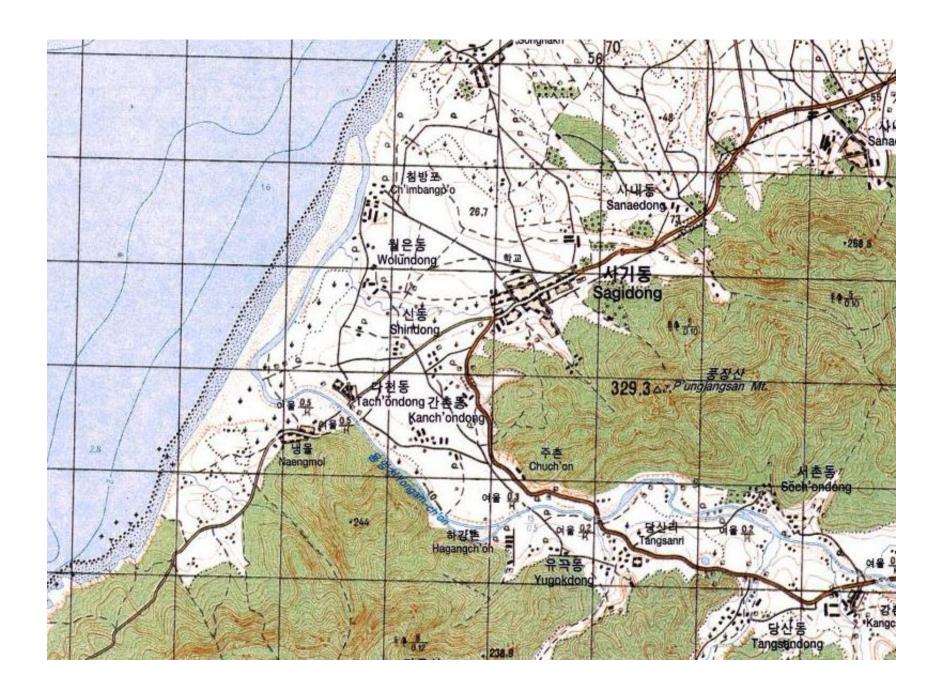


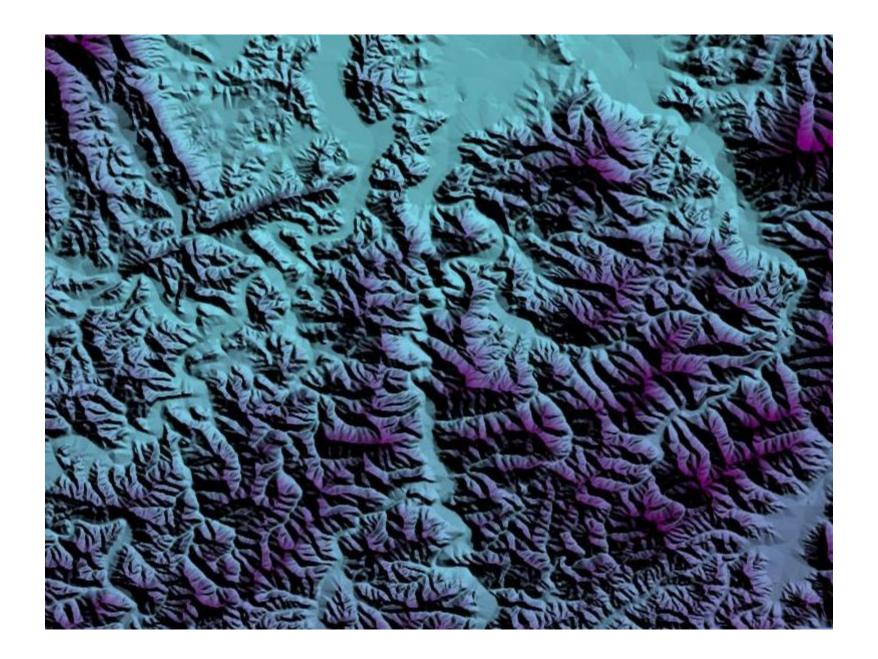


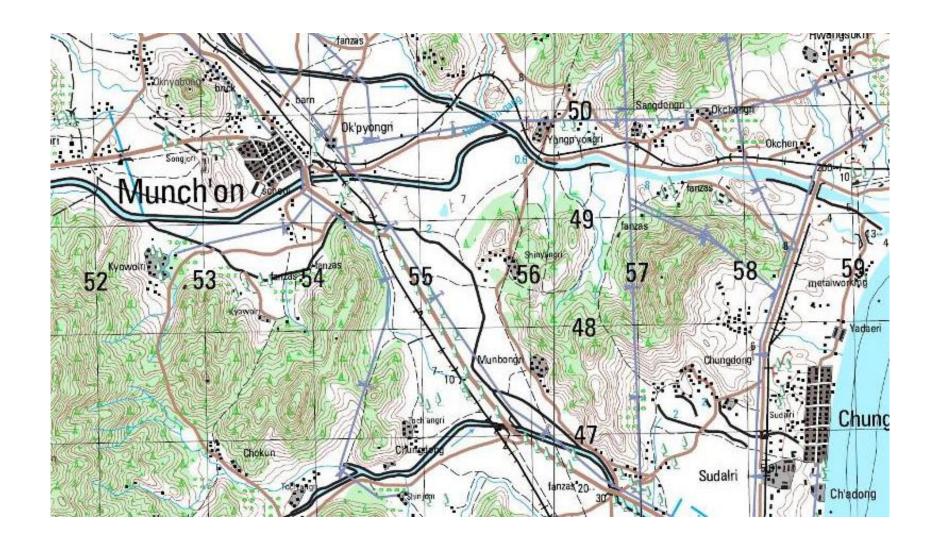


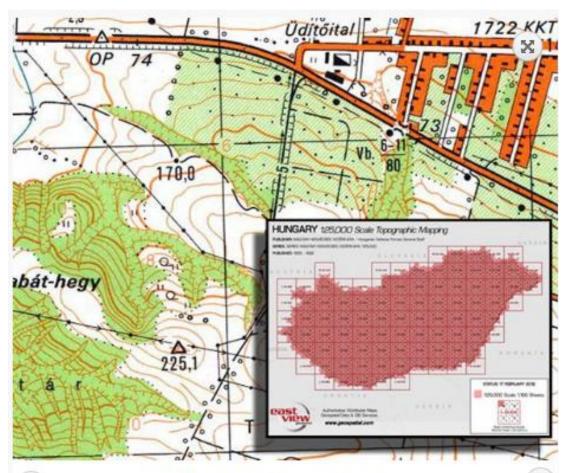
















HUNGARY 1:25,000 Scale Topographic Mapping

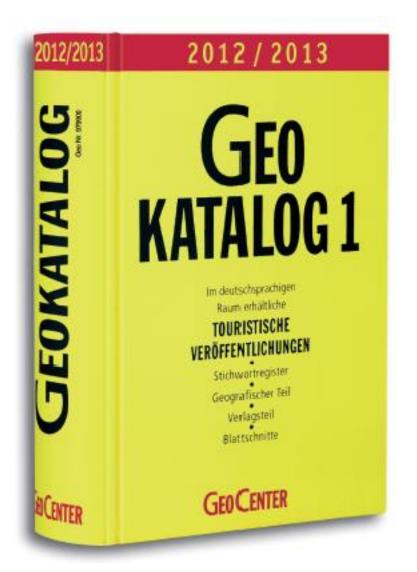
PUBLISHER: Hungarian Defense Forces

General Staff

SERIES: 1:25,000

PUBLISHED: 1955 - 1992

Buy Hungary National 25K Topographic Maps

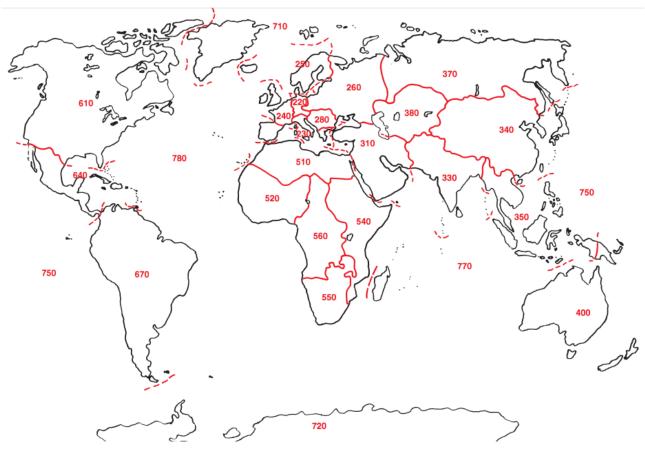


- ILH Stuttgart containing indexes of internationally available maps for sale



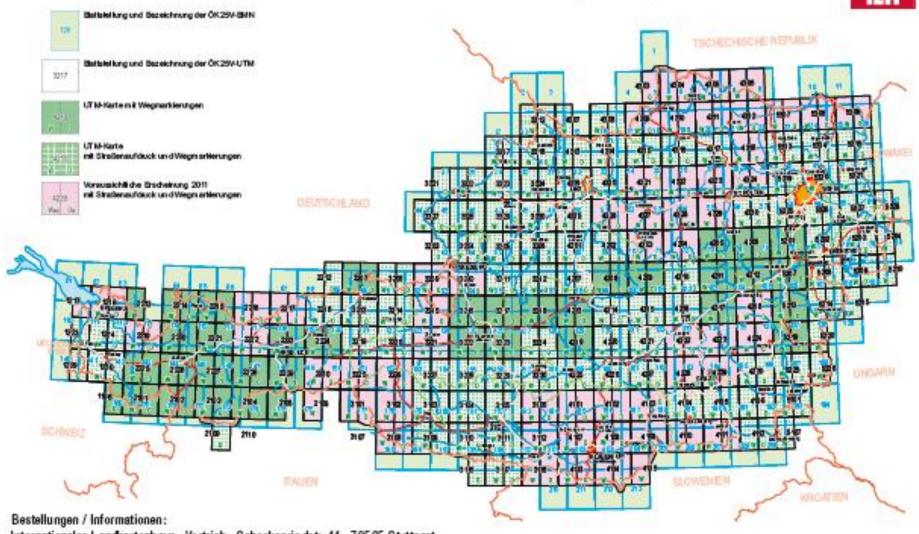
The variety of worldwide geoscientific cartography from a single-source: ILH.





## Amtliche topografische Wanderkarten Österreich 1:25 000 des BEV (Bundesamt für Eich- und Vermessungswesen), Wien



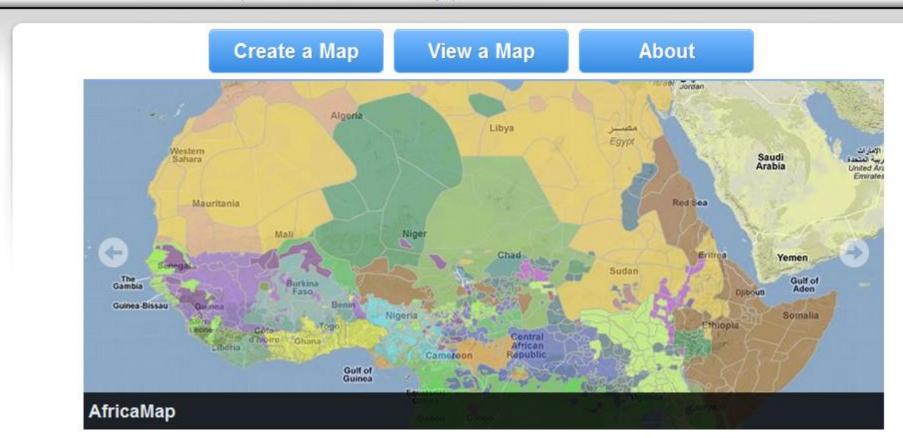


Internationales Landkartenhaus - Vertrieb - Schockenriedstr. 44 - 70565 Stuttgart
Tel. ++49 (0) 711/49 07 22-10 - Fax ++49 (0) 711/49 07 22-11 - E-Mail: ilhinfo@ilh-stuttgart.de - Internet: www.ilh-stuttgart.de

# **WorldMap** of the Center of Geographic Analysis, Harvard University, is a tool for integration of different maps

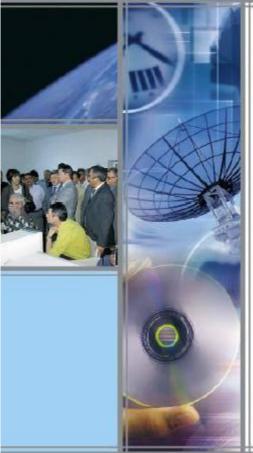


Explore, Visualize, and Publish Geographic Information









Creation of digital cartogriphic base on the basis of orthorectified satellite images, as well as technologies for remote access to digital databases using geoportals and tile services

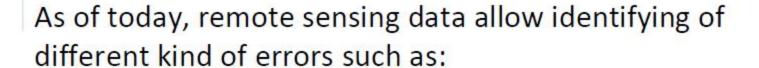
Ilya Farutin Head of integrated projects SCANEX R&D Center



WWW.SCANEX.RU



### **Possibilities**

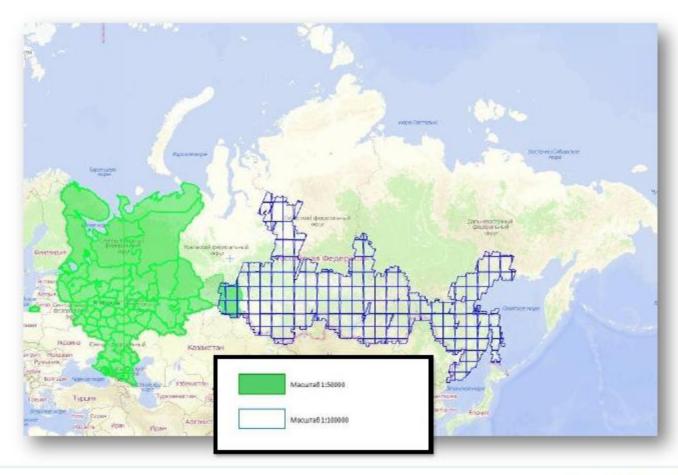


- •Errors in the cadastral numbers;
- Topology errors;
- Cross of administrative boundaries
- And many more...



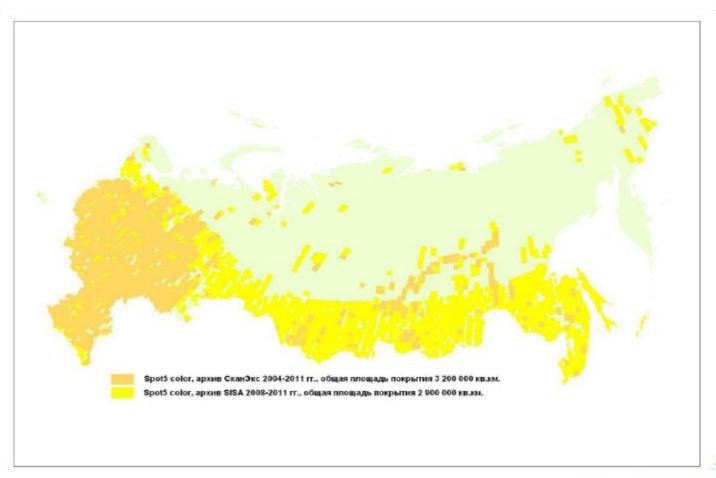
# Base coverage Scale levels 1:50000 and 1:100000 (orthorectified and color-balanced mosaics)







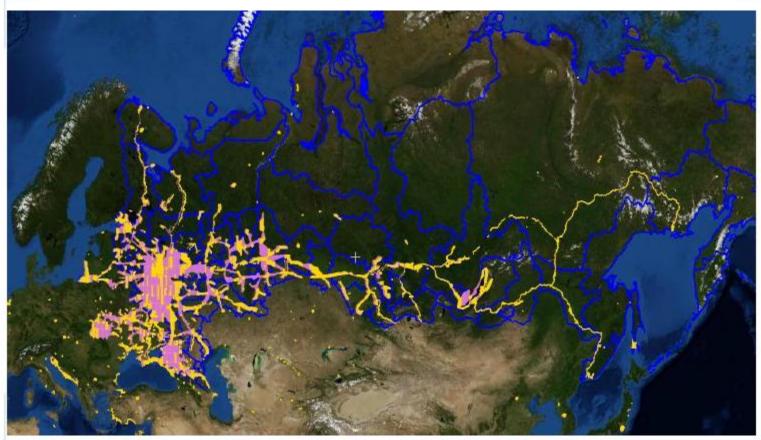
## Scale 1: 25000 (SPOT-5 data)





## Scale 1:10000 (IKONOS data)





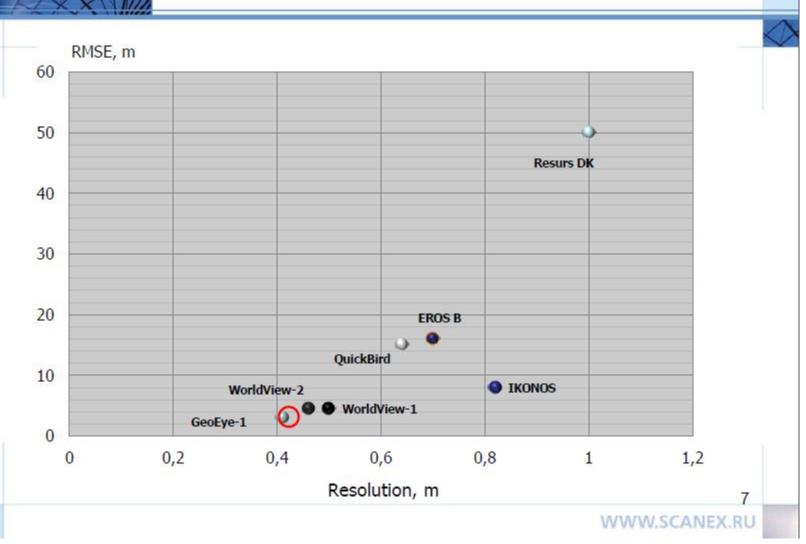


## **IKONOS** data

- > Scale 1:10000
- Total area of the data on infrastructure of Russia is 1,3 million square kilometers.
- Going to have 50 million square kilometers worldwide.
- Data, acquired not earlier than 2010.



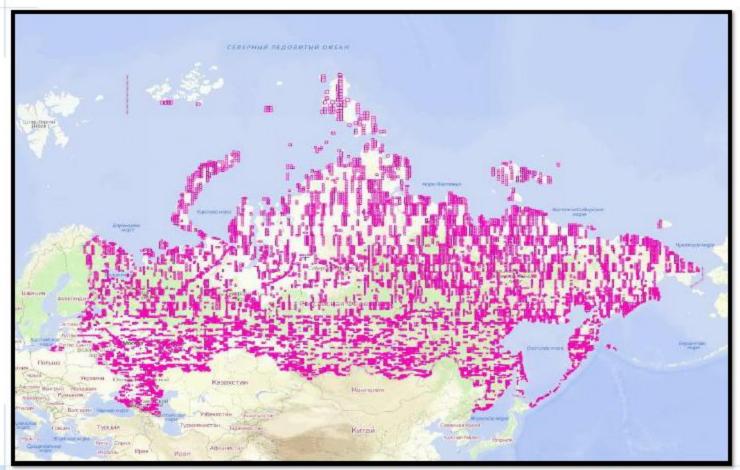
## Up-to-date very high resolution satellites





# Making complete coverage with 0,5 m resolution (Scale 1:5000)





### **Conclusion:**

- 1. UN-GGIM is the only appropriate body to collect map cover and map update information officially from the UN member countries
- 2. ISPRS, FIG, ICA and JB-GIS as well as EuroSDR and others can help as NGO's in the collection and analysis process
- 3. Images are often more useful than outdated maps, which due to cost or time restraint cannot be updated fast
- 4. A call for help is being extended to all who are able to make a contribution toward clarifying the current mapping and map update status of the world