



Digital Earth

Information Resources for Global Sustainability

*The 3rd International Symposium on Digital Earth
Brno, Czech Republic, September 21-25, 2003*

FINAL PROGRAMME



Sunday, September 21st

Opening Ceremony

17:00-19:30 Opening Speeches:

Vladimir MLYNAR (Minister of Informatics)

Pavel VOSALIK (Deputy-Minister of Foreign Affairs)

Veronika NEDVEDOVA (Memoforum, Member of Parliament)

Addresses of Regional Officials

Francisco AYALA - Address

Huadong GUO (ISDE)

Bart HOOGENRAAD (Intergraph)

Ondrej FELIX (Czech Telecom)

Jelle U. HIELKEMA (FAO)

Horst KREMERS (CODATA)

Ammatzia PELED (ISPRS)

Franz-Josef RADERMACHER (Global Society Dialogue)

Raoul WEILER (Club of Rome)

Myra BAMBACUS (NASA) - NASA's Perspective on Geospatial Interoperability.

Peter JOHNSTON (EU) - A European Way to a Sustainable Knowledge Society

Exhibition Opening

19:30-21:00 **Ice Breaking Party**

Monday, September 22nd**Keynote:**

9:00-9:30 PULUSANI Preetha (Intergraph)

Enabling Interoperable Spatial Data Infrastructures for Sustainable Development**Stream I. - September 22nd**9:30-10:00 **coffee break****Topic 1 - Data, Information, Knowledge, Technologies and Techniques****Chairman:** Marek BARANOWSKI (Poland), Ilya ZASLAVSKY (USA)

10:00-12:00 HOOGENRAAD Bart

Open Interoperability: From Conception to Realisation

KLENOV Valeriy I.

The Simulation Technology for River Basins Sustainable Management

LI Qi, GUO Lingling, BAI Yuqi

Research on the MDA-based GIS Interoperability

PODOBNIKAR Tomaz, OSTIR Kristof

Spatial Variables Modelling for High Quality DTM Production

LI Xiang, LIN Hui

A Lane-Specific, Temporal Gis-T Data Model for Mobile Object in Dynamic Road Network

12:00-13:30 **LUNCH****Chairman:** Jiri HREBICEK (CR), Bart HOOGENRAAD (Netherlands)

13:30-15:00 QUAK Wilko, STOTER Jantien, TIJSSEN Theo

Topology in Spatial DBMSs

LI Danning, GEORGE Chris

Formal Specification with RAISE for a GIS Based Decision Support System*

BARANOWSKI Marek

Integration Role of the General Geographic Database

ZASLAVSKY Ilya, MEMON Ashraf, PETROPOULOS

Online Querying of Heterogeneous Distributed Spatial Data on a Grid

Michalis, BARU Chaitan

15:00-15:30 **coffee break****Chairman:** Vladimir Tikunov (Russia), Jean-Philippe LAGRANGE (France)

15:30-17:00 HIELKEMA Jelle U.

FAO Spatial Information Management and Applications

HREBICEK Jiri, PESL Jan, RACEK Jaroslav

Location of Pollution Source by Means of Numerical Optimization

OPPONG Steward Harison

Reliability and Redundancy in Complex Digital System

JIANG Bin, VESELY Martin

Path Direction Using the Number of Junctions

KOLEJKA Jaromír, PLSEK Vladimir, POKORNY Jan

Digital Landscape Model – an integrated tool for area management

17:00-17:30 **refreshment****Chairman:** Jelle U. HIELKEMA (FAO), Milan KONECNY (CR)17:30-19:00 **Topic 7 - European Spatial Data projects**

ANNONI Alessandro, SMITS Paul (JRC Ispra)

INSPIRE: Technical Aspects and Links with Global Interoperability Initiatives

RASE Daniel (Eurostat, Luxembourg)

Spatial Data Infrastructure in Europe: State of Play

PAUKNEROVA Eva (CAGI CR)

A Network Knowledge Society Geographic Information Network in Europe

CROMPVOETS Joep (Wageningen Univ., NL)

Survey Results of the Impact Study of INSPIRE-key Data Sets

PASEK Oldrich, SLABOCH Vaclav (CUZK, VUGTK CR)

Governmental Spatial Data Supporting National Development

LAGRANGE Jean-Philippe (IGN-F)

Towards a European Spatial Data Infrastructure - the Role of EuroGeographics

Stream II. - September 22nd9:30-10:00 **coffee break****Topic 8 - Digital Earth****Chairman:** Alan R. STEVENS (USA), Vaclav SLABOCH (CR)

10:00-12:00	FUKUI Hiromichi, TAKAHASHI Junjiro	Digital Earth - it's Ideal, Reality and Future - Asian Version Takes Off.
	MARTYNENKO Alexander	The Earth Knowledge Base and Global Information Society
	GUO Huadong, FAN Xiangtao, SHAO Yun, WANG Changlin	Introduction to Digital Earth Prototype System
	FORESMAN Timothy W.	3D Geobrowsers: Gateway to Digital Earth
	LIN Yu, LI Qi	A SIG-based Architecture of Digital Earth System

12:00-13:30 **LUNCH****Chairman:** Joel MORRISON (USA), Temenoujka BANDROVA (Bulgaria)

13:30-15:00	FUKUI Hiromichi, FORESMAN Timothy W.	Health Applications for Digital Earth
	LI Deren	On Geospatial Data Infrastructure of China
	KHRAISH Maroun	Digital Lebanon for Global Development
	XUE Yong, WANG Jianqin, SHENG Xiangyu, GUO Huadong	Building Digital Earth with Grid Computing Technology - The Preliminary Results

15:00-15:30 **coffee break****Chairman:** Shupeng CHEN (China), Angela IONITA (Romania)

15:30-17:00	SOBUE Shin-ichi, OCHIAI Osamu, YOKOYAMA Ryuzo, KUROIWA, KAWAHITO Kaori	Introduction of Digital Asia Network
	WANG Qian, XU Yanying, LUO Jianjun, LI Weijian, ZHANG Jixian	Construction of the Digital China
	YANG Chong Jun, ZHANG Jing Dong, BAI Xin, LIN Shao Fu, LIU Ning	Digital Beijing Strategies and Practise
	FAN Xiangtao, SHAO Yun, GUO Huadong, WANG Yonghong, LI Hongga, ZHU Junjie, ZHU Lingfeng	Study on Urban Planning Simulation System of Olympic Green of Beijing, China

Stream III. - September 22nd

9:30-10:00 **coffee break**

Topic 5 - Delivering Services to Citizens: From Web to Mobile

Chairman: Bengt RYSTEDT (Sweden), Liao KE (China)

10:00-12:00	GUPTA Ravi	ICTS for the Underserved Communities: What Role GIS Has to Play?
	CHARVAT Karel	WirelessInfo – Mobile Applications According INSPIRE Principles
	LI Qi, SHI Wenyong, LIN Yu	A New Architecture of Mobile Spatial Information Service System
	LI Qi, CAO Jian	Research on the LBS (location based services) in E-business
	PAUKNEROVA Eva	Delivering Services to Citizens: Changing Approach and Access to Geographic Information

12:00-13:30 **LUNCH**

Chairman: Karel CHARVAT (CR), David DANKO (USA)

13:30-15:00	REINHARDT Wolfgang, KANDAWASVIKA Admire, SAYDA Florian, WANG Fei, WITTMANN Elmar	Location Based Services to Support Citizens During Recreational Activities
	PEINEL Gertraud, ROSE Thomas, SEDLMAYR Martin	APNEE - Air Pollution Network for Early Warning and Information Exchange in Europe
	KUROIWA Kaori, OCHIAI Osamu, SOBUE Shin-ichi	Forest Monitoring Prototype System Using Web Mapping Technology
	COLAIACOMO Lucio, BRÖNNER Christine, ANDREU Joaquin Pérez, SUATONI Andrea	Including GIS functionality in a JAVA and XML Based System

15:00-15:30 **coffe break**

Chairman: Jaromir KOLEJKA (CR), Santiago BORRERO (Colombia)

15:30-17:00	PERCIVALL George, PLESEA Lucian	Web Map Services (WMS) Global Mosaic
	ORMELING Ferjan	The National Atlas as Portal for the National Spatial Data Infrastructure
	VOZENILEK Vit	Gis and Internet within Atlas Production
	VRATNY Martin, DRBOHLAV Zdenek	State Mapping Centre - Mapping Services over the Internet as a Part of the Governmental Portal
	HRADEC Jiri	A Context Based Publishing of Environmental Information Portal

Tuesday, September 23rd

Keynote:

9:00-10:00 **AYALA Hana (Pangea World Inc., USA)**

The Art and Power of Welding Science and Heritage in a Knowledge Economy for the 21st Century

Stream I. - September 23rd

10:00-10:30 **coffee break**

Topic 1 - Data, Information, Knowledge, Technologies and Techniques

Chairman: Gottfried KONECNY (Germany), Petr DOBROVOLNY (CR)

10:30-12:00 SCHOLTEN Henk, DEKKERS Jasper, CAMARA Antonio, VAN DE VELDE Rob

Geospatial Virtual Environments, Onwards a New Paradigm in Geovisualisation

ZHAO Lihua, LU Hongwei

Data Integration and Visualization for a CRM System: an Internet-based Solution

URSIC Natasa, JAGARINEC Borut

Harmonised Geographical Information System for Mine Action in South East Europe

HIESS Jiri

Introductory Study of GIS Regions in the Czech Republic

12:00-13:30 **LUNCH**

Chairman: Guo HUADONG (China), Raina PAVLOVA (Bulgaria)

13:30-15:00 WANG Shuliang, SHI Wenzhong, LI Deren

Principles of Spatial Data Mining and Knowledge Discovery

HALOUNOVA Lena, KALAT Josef, VOLF Stanislav

GIS for Creation of Geodynamic Model of Mining Areas

FANG Yu, TANG Xinming, KAINZ Wolfgang

A Composite Method to Generate Fuzzy Land Cover Objects from TM Images

15:00-15:30 **coffee break**

Chairman: Steeve EBENER (Switzerland), Wenjun XIE (China)

15:30-17:00 KONECNY Gottfried

Mapping from Space

VOLPE Fabio

Mapping Information from Space with Quickbird Satellite Data

BANDROVA Temenoujka

Innovative Technology for Creation of 3D Map

CHEN Minfeng, WANG Qinmin, FRASER Clive S., YU Xusheng, WANG Ying

Digital Photogrammetry and Digital Fujian

19:00-22:00 **Gala Dinner**

Stream II. - September 23rd

10:00-10:30 **coffee break**

Topic 3 - Global Society Dialogue

10:30-12:00 RADERMACHER Franz-Josef

The Global Society Dialogue

12:00-13:30 **LUNCH**

13:30-15:00 **Panelists:** SCHAUER Thomas (Germany), AKINYEMI Felicia Olufunmilayo (Nigeria), SHUPENG Chen (China), WEILER Raoul (Club of Rome)

EIVAZZADEH Shahryar

National Boundaries in Cyberspace

VRANES Sanja, PETERSON Terry

Innovative Technology Intelligence and Transfer Framework

CAVE Jonathan

The Distributional Proposition for the Information Society

15:00-15:30 **coffee break**

Topic 2 - Global Sustainability: Concepts and Debates

Chairman: Hana AYALA (USA), Ulrich BOES (Bulgaria)

15:30-17:00 WOODSFORD Peter

Getting it Together – the Geography Jigsaw

MISUND Gunnar, HOIBERG Jan

Sustainable Information Technology for Global Sustainability

AHLSKOG Jan

New Partnerships for Sustainable Development in the Knowledge Economy

SCHAUER Thomas

Biological Diversity - Real Threat and Virtual Rescue?

WANG Jinxin, BIAN Fuling

GIS - the Digital Models of Regional Sustainability

19:00-22:00 **Gala Dinner**

Stream III. - September 23rd

10:00-10:30 **coffee break**

Standards Workshop - Co-sponsored by ISO/TC 211 Geographic information / Geomatics and the OpenGIS Consortium (OGC)

Chairman: Henry TOM (USA), Vincent DESSARD (Belgium)

10:30-12:00 TOM Henry (ISO/TC 211)

Standards for Enabling International Interoperability

DANKO David (ESRI)

ISO Metadata Standard - Overview and Demonstration

PORTELE Clemens (Interactive-instruments)

Geography Markup Language (GML) - Overview and Demonstration

12:00-13:30 **LUNCH**

13:30-15:00 DESSARD Vincent (IONIC Software)

Web Map Server (WMS) & Web Feature Server (WFS) - Overview and Demonstration

BARTAK Peter (Intergraph)

Intergraph Inputs to Interoperability - Overview and Demonstration

15:00-15:30 **coffee break**

Topic 7 - Global Spatial Data Projects

Chairman: Ravi GUPTA (India), Alessandro ANNONI (Italy)

15:30-17:00 STEVENS Alan R.

Global Spatial Data Infrastructure (GSDI): Finding and Providing Tools to Facilitate Capacity Building

BORRERO Santiago

What Barriers Are Blocking SDI in Developing Economies

EVANS John D.

A Geospatial Interoperability Reference Model

EBENER Steeve, BRAY Helene, GUIGOZ Yaniss,

The Second Administrative Level Boundaries Data Set Project (SALB) Concepts, Progresses and Future

CHOW Alice

CADA Vaclav, HOJDAR Josef, MARTINEK Milan

Reference and Core Data - Is There Still Anything to Taking Care of?

19:00-22:00 **Gala Dinner**

Wednesday, September 24th

Keynote:

- 9:00-10:00 **BEROVA Dana (Deputy Minister, Ministry of Informatics CR)** **Knowledge-Based Society in Czech republic: the state-of- the-art**
BLAKEMORE Michael (Durham University, UK) **Discourse of data: Geographic Information, Society and Globalisation**

Stream I. - September 24th

10:00-10:30 **coffee break**

Topic 1 - Data, Information, Knowledge, Technologies and Techniques

Chairman: Michael BLAKEMORE (UK), Yufen CHEN (China)

- 10:30-12:00 **GOLAN Jiri, KUCERA Michal, MACHACEK Jiri** The Application of GIS in the Archaeology – intra and inter site analysis in Breclav - Pohansko, Czech Republic
TANG Aiping, WEN Aihua, WU Yixue GIS and Earthquake Disaster Assessment
WATERHOUSE Laurence, MEGSON Victoria Geoscan, the Future of Data Acquisition
MLCOUSEK Marek, MANSFELD Vratislav, POSPISIL Martin Forest Management Institute and Its Projects

12:00-13:30 **LUNCH**

Chairman: Yanying XU (China), Wolfgang KAINZ (Austria)

13:30-15:00 **Topic 6 - Digital Cities**

- LI Qi, CAO Jian** Study on the Digital Cities and Location-based Services - From the Perspective of Urban System
RYSTEDT Bengt Terrestrial Laser Scanning for Documentation of Buildings
FOGEL Piotr, FISZCZUK-WIKTOROWICZ Jolanta Data Bases in Spatial Planning on a Local Level

15:00-15:30 **coffee break**

Chairman: Jan AHLKOG (Belgium), Jiandong ZHANG (China)

- 15:30-17:00 **LI Qi, CAO Jian** "Digital Beijing" and Location Lased SARS Control System
JING Dongsheng, BI Siwen, ZHANG Liyan Study of the Standard Architecture and Contents of Digital City
LI Danning, LIAO Xiaohan The Study on Strategy and Policy of Narrowing "The Digital Gap" in Guizhou Province

18:00-23:00 **Wine Cellar Excursion**

Stream II. - September 24th

10:00-10:30 **coffee break**

Topic 2 - Global Sustainability: Concepts and Debates

Chairman: Henry TOM (USA), Eva PAUKNEROVA (CR)

10:30-12:00	TESCH Tom, DESCAMPS Pol T., WEILER Raoul	The COSMOPAD Modelling Framework: Conceptual System Dynamics Model of Planetary Agricultural & Biomass Development*
	CHEN Shupeng	Bridging over the Digital Gap for Sustainable Development
	LAHSER Kerstin, DOMPKE Mario	The Focus Topic "Public Procurement" in the Project "Roadmap for a Sustainable Development of Information and Communications Technologies"
	WAHIDULLAH Abu M.	Spatial Analytical Technique in Developing a Digital River Database with Particular Reference to a South Asian Nation's Flooding Issues – an Integrating Approach of Geosciences, Electronics and Information Technology in Natural Resources Management
	AKINYEMI Felicia Olufunmilayo	Geographic Targeting Information System (GTGIS): A Prototype Urban Poverty Management Initiative For Sub-Saharan Africa

12:00-13:30 **LUNCH**

Chairman: Timothy W. FORESMAN (USA), Vit VOZENILEK (CR)

13:30-15:00	WORTLEY David John	The Role of Social Enterprise in Building Sustainable Community Networks
	LIAO Ke, ZHENG Daxian, CHEN Wenhui, SHA Jinming	The Design of Ecological Environmental Dynamic Monitoring and Management Information System in Fujian Province
	DOBROVOLNY Petr, FUKATKO Jan	Digital Mapping of Climate History of the Czech Republic from Documentary Sources
	LIEBENBERG Elizabeth C.	Mapping for Sustainable Development - Cartographic Endeavours in the Republic of South Africa since 1994
	Svatonova Hana, Vranka Pavel	Small Scale Digital Landscape Model – Applications for Monitoring and Management of Environmental Processes in Haraska Watershed

15:00-15:30 **coffee break**

Chairman: Amatzia PELED (ISPRS), Elri LIEBENBERG (SA)

15:30-17:00	NAHUM Gershom	Storytelling and Mapping
	MAYER Walter H.	Sustainability Supporting Agriculture and Forest Applications Based on GIS
	ROTANOVA I.N., MIKHAILOV S.A., SHIBKIKH A.A.	Problems and Approaches to the Unification of Cartographic GIS Information in Hydrological Modelling
	HRADEC Jiri	Environmental Information Acquisition Sustainability: Management of the Data Design

18:00-23:00 **Wine Cellar Excursion**

Stream III. - September 24th

10:00-10:30 **coffee break**

Topic 4 - A Networked Knowledge Society

Chairman: Hiromichi FUKUI (Japan), Peter van OOSTEROM (Netherlands)

10:30-12:00	KAINZ Wolfgang	Integration of e-government and Geodata Policy: Challenges and Opportunities
	CAVE Jonathan	Economy - the 'e' in e-democracy
	ZHANG Xiuhua	Enhancement of Knowledge Sharing via Enterprise Portal in Network-Based Knowledge Society
	VESELY Vlastimil	Building Communities and Knowledge Networks in Practice

12:00-13:30 **LUNCH**

Chairman: George PERCIVAL (USA), Irina N. ROTANOVA (Russia)

13:30-15:00	ZIMOVA Ruzena	How to Strengthen Public-Private Co-Operation in the Field of Geoinformation – a Case Study of Nemoforum
	PEINEL Gertraud, ROSE Thomas, SEDLMAYR Martin	ENV-e-CITY – Creating a Marketplace for Environmental Data and Services
	CHARVAT Karel	Rural Wins as Strategy for e-rural Policy
	LEMMEN Christiaan, MOLEN Paul van der,	A Modular Standard for the Cadastral Domain
	OOSTEROM Peter van, PLOEGER Hendrik, QUAK	
	Wilko, STOTER Jantien, ZEVENBERGEN Jaap	

15:00-15:30 **coffee break**

Chairman: Seyed B. GHAZANFARI (Iran), Ruzena ZIMOVA (CR)

15:30-17:00	MORRISON Joel L.	Changes in Education, Skills and Training for 21st Century Spatial Data Cognizant Societies
	BARTAK Peter	Some Lessons Learned from Implementations of Various SDI Components
	ZIDEK Vladimir, KLIMANEK Martin	Digital Data and Spatial Technologies for Czech Forestry Students Education
	LEE Tien-Rein	Managing University Community by Utilizing Digital Earth Conceptual Model

18:00-23:00 **Wine Cellar Excursion**

Thursday, September 25th

Keynote:

9:00-9:30 **PARSONS Ed (Ordnance Survey, UK)**

Mapping Agencies - the Customer in Control

9:30-10:00 **FOUST Jeane (ESRI, USA)**

Digital Earth: Implementing the Millennium Goals

Stream I. - September 25th

10:00-10:30 **coffee break**

Topic 1 - Data, Information, Knowledge, Technologies and Techniques

Chairman: Myra BAMBACUS (USA), Bahadur K. C. LACHHE (Nepal)

10:30-12:00 XIE Wenjun

Agent-based Cartography: A New Tool to Digitalize the Earth

ZHAO Lihua, LU Hongwei

Use of Digital Data and Mapping for Automobile Market Analysis

HAJEK Jiri

M2M or Machine-to-machine Applications and their Future in the Czech Republic

SHA Jinming, YANG Wunian, LI Xiaomei, CAI Qin

Using Remote Sensing in Land Resources' Exploitation in China

12:00-13:00 **Final Glass of Wine**

Stream II. - September 25th

10:00-10:30 **coffee break**

Topic 7 - Regional Spatial Data Projects

Chairman: Maroun KHRAISH (Lebanon), Hana Svatonova (CR)

10:30-12:00 REMETEY-FULOPP Gabor, POSFAI Marianna,
GOMBAS Laszlo, NAGY Gabor

The Central-European Land Knowledge Centre with Geoweb Based Service

BOES Ulrich, PAVLOVA Raina

Building and Exploiting a Regional Spatial Data Infrastructure the Case of South East Europe

SANDMANN Stefan

Topographic Information Service in North – Rhine Westphalia Quality Protection of Digital Maps

STEVENS Alan R.

US Federal Geographic Data Committee Initiatives: Geospatial One-Stop and Implementation Teams

MICIETOVA Eva, KONECNY Milan

Sources of Geographic Information, International Standards and National Infrastructure of Spatial Information in the Slovak Republic

LACHHE Bahadur K.C.

Information Technology and its Development in Nepal

12:00-13:00 **Final Glass of Wine**

Stream III. - September 25th

10:00-10:30 **coffee break**

ESRI - Workshop: Vision for the Emerging Digital Earth; Technical Approaches

10:30-12:00 FOUST Jeanne

DANKO David

CALKINS John

12:00-13:00 **Final Glass of Wine**

Poster Session - open from Monday morning (September 22) till the end of the symposium on Thursday (September 25)

The authors of the posters shall be available for discussion at their posters on Wednesday during coffee breaks.

Chairman: Liao KE (China), Karel STANEK (CR)

1. BURAVLEV Y., DRYCH S Digital Model of Construction of Open System of Steady Development
2. BURBA G. A., SHASHKINA V. P., BOBINA N. N., KRYUCHKOV V. P. Comparative Planetology Data Storage Centre at Vernadsky Institute, Moscow Collection of Extraterrestrial Maps and Cartographic Sources
3. FRIEDMANNOVA Lucie, KONECNY Milan, STANEK Karel Design of the Internet based open regional thematic atlas
4. HOFFMANN Frank The Open NODE – An Interoperability Approach to GIS Awareness by Distance eLearning
5. JEONG Yeon-Jeong, YOON Ki-Song, RYOU Jae-Cheol Design and Implementation of DRM-based Digital Contents Distribution Server
6. KANTOR Cestmir, PLACEK Kamil New Technology Dimension of Land Management in The Integrated Administration and Control System for Common Agricultural Policy Support
7. KHLEBOVICH I.A., ROTANOVA Irina N. Regional Medical-Ecological Mapping with the Use of GIS Technologies
8. KUBASEK Miroslav Web Services for Environment e-Society
9. LITWIN Leszek Application of ISDS as Part of the Geographical Information System for Protected High Mountains Area Using Case Study of Czerwone Wierchy Massif (Tatra National Park, Poland)
10. MACHALOVA Jitka Definition of Fuzzygeoelements in Raster Representation for Decision-making
11. NAM Do-Won, YOON Ki-Song Design and Implementation of DRM Client for License-based Digital Content Distribution System
12. PARK Ji-Hyun, KIM Jeong-Hyun, YOON Ki-Song Secure MP4 Streaming
13. PARK Joo-Sang, LEE Yong-Joon Design of Track and Trace System with RFID Tag – The Track and Trace System of VIOLA e-Logistics Platform
14. REMETEV-FULOPP Gabor, POSFAI Marianna, GOMBAS Laszlo, NAGY Gabor The Central-European Land Knowledge Centre with Geoweb Based Service
15. RODIONOVA Irina A., TIKUNOVA Irina N. World Rank of Industry Development Level
16. SAIO Giorgio Nature-GIS: A European thematic network for Protected Areas/Nature Preservation and Geographical Information
17. SHA Jinming, LI Xiaomei, YANG Wunian, CAI Qin Research on Image Processing and Classification of Mountain Soils in Southeast China
18. SIKOLYA Zsolt, REMETEV-FÜLÖPP Gábor Networking: Interdisciplinary GI Community towards „Digital Hungary“
19. TIKUNOV Alexey V. Method of Potentials and World Scale Models
20. TIKUNOV Vladimir S. Integrated Digital Territory Models for Sustainable Development
21. VOLOSOVICH Anatoli, GAEVENKO Aleksandr Dominance of Building of Ukrainian Transport Corridors on Global Ukraine Map
22. WANG Changlin, YIN Ning, NIE Yueping, GUO Shan, CHENG Xiaoyun Research on Multi-sensor Remote Sensing Data for Archaeological Sites in Deserts of China