

ECONOMIC AND SOCIAL COUNCIL

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Seventeenth United Nations Regional Cartographic  
Conference for Asia and the Pacific  
Bangkok, 18-22 September 2006  
Item 7 of the provisional agenda\*

INVITED PAPERS

**A GEOGRAPHIC INFORMATION STRATEGY FOR ASSESSING, MONITORING AND MANAGING DISASTERS IN  
THE ASIA AND PACIFIC REGION**

**Submitted by ISO/TC 211 Advisory Group on Outreach \*\***

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\* E/CONF.97/1

\*\* Prepared by Mr. Henry Tom, Co-Chair, ISO/TC 211 Advisory Group on Outreach.

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# ***A Geographic Information Strategy for Assessing, Monitoring and Managing Disasters in the Asia Pacific Region***

***UN Regional Cartographic Conference  
for Asia and the Pacific***

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**Henry Tom  
Co-Chair, ISO/TC 211 Advisory Group on Outreach**

***September 18-22, 2006  
Bangkok, Thailand***

# *Disasters - Asia Pacific Region*

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## *Emergency:*

*preparedness*

*monitoring*

*assessment*

*management*

*recovery*



*availability and accessibility of  
geographic information*

# *Strategy*

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*Geographic Information -  
standards*



*User Communities*

*Spatial Data Infrastructures*

*ISO Metadata Standard Profiles*

# *Standards*

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**Political compromise**

**Democratic  
mechanism**

**Technology  
transfer**

**Functions**

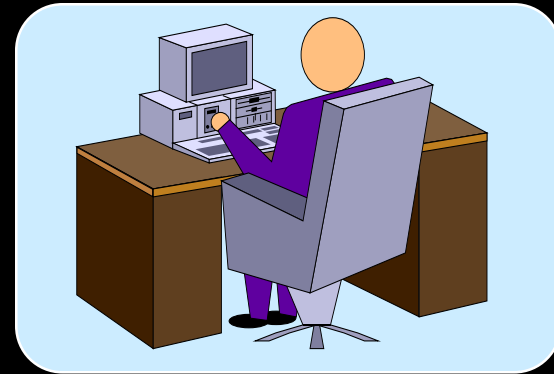
**Consensus technical solutions**

**Role of Research**

# *GIS Standards*

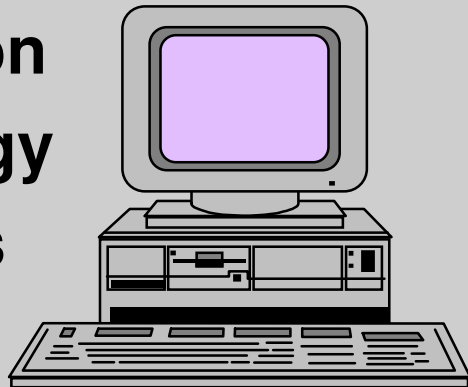


**Adoption / Adaptation**



**Development**

**Information  
Technology  
Standards**



**Spatial Data Standards**

**Define  
Describe  
Process**



**Spatial  
Data**

# *Standardization*

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***De jure – “formal” standardization***

***International Organization  
for Standardization ( ISO )***

***Open Geospatial Organization  
(OGC)***

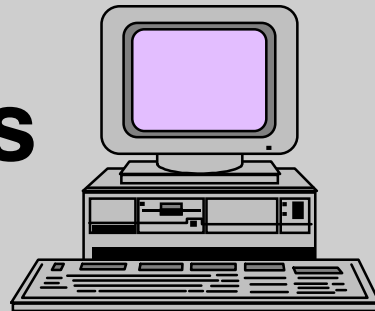
***De facto – “ default” standardization  
standards derived from industry  
or power players***

# *De jure - standardization*

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## Implementation

**Software  
Interfaces**



**Industry**

**Spatial Data  
Standards**



**Data producers  
& users**



# *Standardization Process*

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## Development

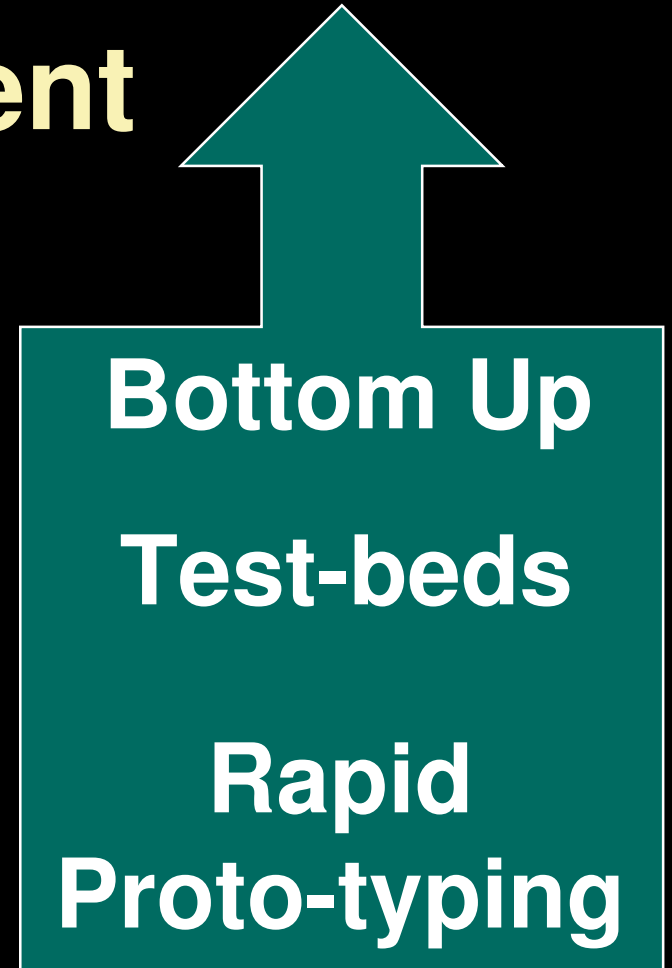
**Top Down**

**Paper  
Specification**

**Bottom Up**

**Test-beds**

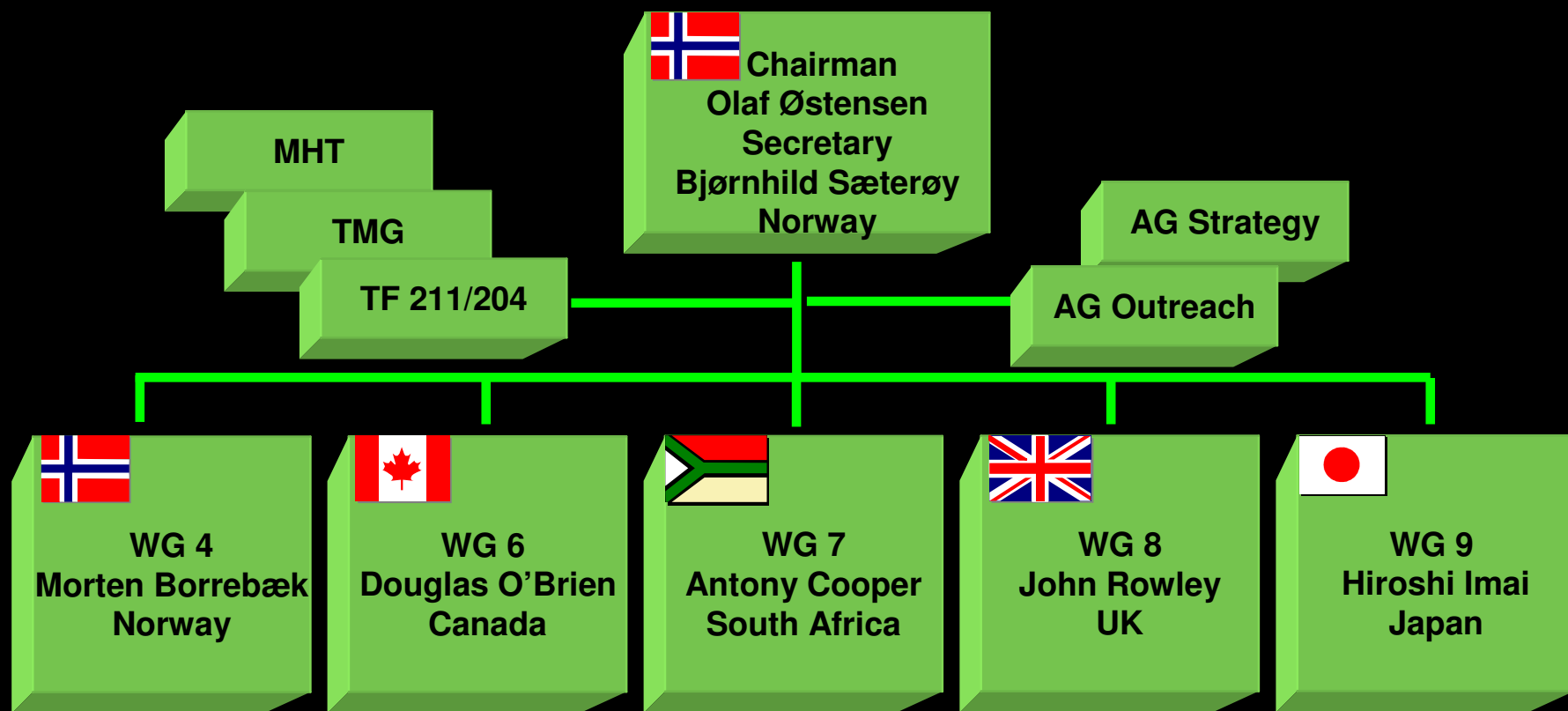
**Rapid  
Proto-typing**



# GIS Standards Infrastructure

Standards Organization	Standards Scope	User / Industry Organizations
Federal Geographic Data Committee ( FGDC )	Government	US Government agencies
American National Standards Institute ( ANSI )	National	US Federal, state, county, city agencies, public, and industry
European Committee for Standardization ( CEN )	Regional	Digital Geographic Information Working Group ( DGIWG ) <b>Infrastructure for Spatial Information in Europe ( INSPIRE )</b> Permanent Committee on GIS Infrastructure for Asia and the Pacific ( PCGIAP )
International Organization for Standardization ( ISO ) Open GIS Consortium ( OGC )	International	International Cartographic Assoc. ( ICA ) International Hydrographic Bureau ( IHB ) , etc.

# ISO/TC 211 Geographic information/Geomatics



**Geospatial services**

**Imagery**

**Information communities**

**Location based services**

**Information management services**

**Countries + 50**

**Liaison organizations + 25**

**Standards committees + 12**



# *Mission*

***ISO / TC 211 – creating a structured set of integrated geographic information data standards through an international consensus process of development and approval.***

***Almost 30 ISO standards and technical reports have been published.***

# *ISO/TC 211 Standards*

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## *1<sup>st</sup> Generation:*

**A set of 20 integrated standards**

## *2<sup>nd</sup> Generation:*

**Location based services standards**

**Imagery standards**

# *ISO / TC 211 Website*

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You will find updated information on ISO/TC 211 on the following World Wide Web-server :

*<http://www.isotc211.org>*

containing :



- Secretariat
- Organization
- Calendar
- About...
- Resolutions
- Document list
- Scope and work programme
- Mail to secretariat
- Newsletter and information
- Presentations (slides)

# *Open Geospatial Consortium ( OGC )*

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## OGC Mission

Our core mission is to deliver interface specifications that are openly available for global use.

*OGC is an international industry consortium of over 300 companies, government agencies and universities participating in a consensus process to develop publicly available geoprocessing specifications.*

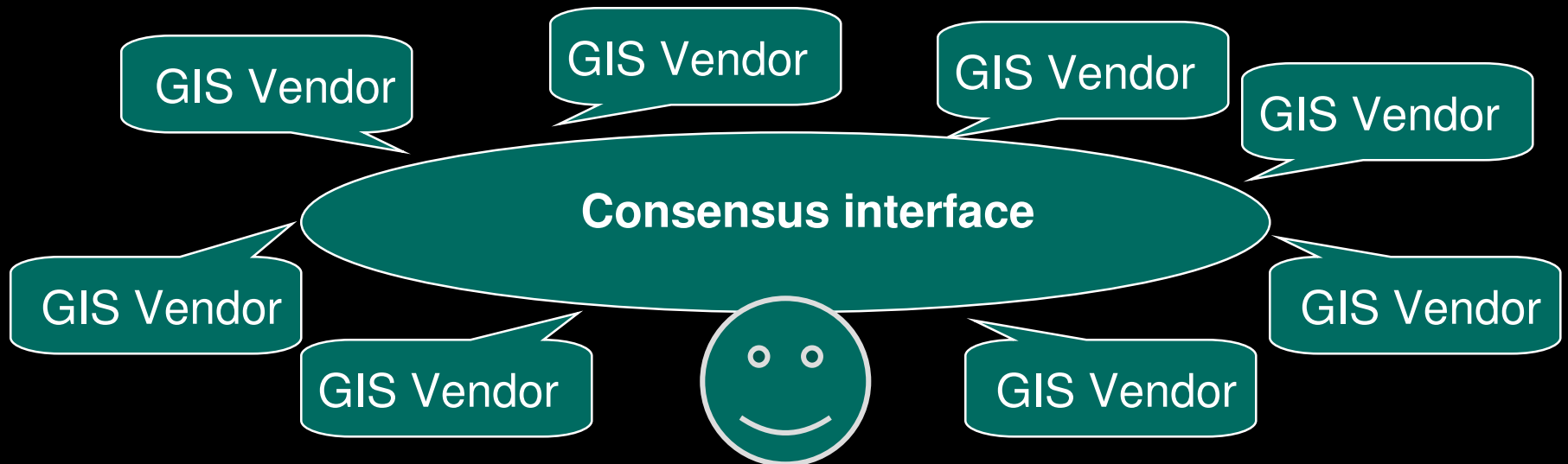
<http://www.opengeospatial.org>

# *Open Geospatial Consortium ( OGC )*

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**Software components from multiple vendors interact through consensus / open interfaces**

**Consensus interfaces enable "one-to-many" interoperability:  
"How many one-to-one translations do you need to do before it becomes apparent that one-to-many is better and less expensive?"** – Sam Bacharach, OGC





# *ISO/TC 211 & OGC*



**1994**

**ISO/TC 211 - de jure formal standards technical committee**

**OGC - de facto industry technical specifications**

**1999 - OGC - ISO/TC 211 Class A Liaison status**

**ISO/TC 211 & OGC Joint Advisory Group ( JAG )**

**ISO standardization of OGC specifications: Simple Features Access, Web Mapping Server Interface**

**Jointly develop the Imagery & gridded data Reference Model, Framework, and the OGC Sensor Markup Language Geography Markup Language ( GML )**

# ***De facto - standardization***

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**de facto standardization - defaults to dominance**

**de jure standardization – formal, institutionalized**

**June 2006 –Google Earth software  
downloaded by over 100 million people**

**Google API – probably a very large number**

**May 2006: Map directions**

**Google - 26 million US visitors**

**Yahoo – 26.1 million visitors**

**Mapquest – 43.5 million visitors**

**e.g., Open Source Geospatial Software**

# *User Communities*

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*National Mapping Organizations (NMO's) & governmental entities*



*Professional & Non-Governmental Organizations (NGO's)*

*Geospatial industry – vendors, corporate, and consumers*

# ***National Mapping Organizations***

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## **ISO / TC 211 Focus Group on Data Producers 2005 Standards Survey**

**Data producers**

**Data users**

**Geospatial industry**

**Over 400 questionnaires sent out –  
with over 100 organizations responding**

# *FGDP 2005 Survey Results*

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**95 % of the organizations recognize the importance of standards for geographic information**

**Almost 80 % of the organizations were involved in a spatial data infrastructure ( SDI )**

**The most widely recognized and implemented standard is the **ISO Metadata Standard****

# ***Professional Societies & NGOs***

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<b><i>CEOS</i></b>	<b><i>Committee on Earth Observation Satellites</i></b>
<b><i>DGIWG</i></b>	<b><i>Digital Geographic Information Working Group</i></b>
<b><i>EPSG</i></b>	<b><i>European Petroleum Survey Group</i></b>
<b><i>FIG</i></b>	<b><i>International Federation of Surveyors</i></b>
<b><i>GSDI</i></b>	<b><i>Global Spatial Data Infrastructure</i></b>
<b><i>IAG</i></b>	<b><i>International Association of Geodesy</i></b>
<b><i>ICA</i></b>	<b><i>International Cartographic Association</i></b>
<b><i>ICAO</i></b>	<b><i>International Civil Aviation Organization</i></b>
<b><i>IEEE</i></b>	<b><i>Geoscience and Remote Sensing Society</i></b>
<b><i>IHB</i></b>	<b><i>International Hydrographic Bureau</i></b>
<b><i>ISCGM</i></b>	<b><i>International Steering Committee for Global Mapping</i></b>
<b><i>ISPRS</i></b>	<b><i>International Society for Photogrammetry and Remote Sensing</i></b>

# ***Professional Societies & NGOs***

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<b><i>JRC</i></b>	<b><i>Joint Research Centre, European Commission</i></b>
<b><i>OGC</i></b>	<b><i>Open Geospatial Consortium, Inc</i></b>
<b><i>PAIGH</i></b>	<b><i>Pan American Institute of Geography and History</i></b>
<b><i>PCGIAP</i></b>	<b><i>Permanent Committee on GIS Infrastructure for Asia and the Pacific</i></b>
<b><i>PC IDEA</i></b>	<b><i>Permanent Committee on Spatial Data Infrastructure for the Americas</i></b>
<b><i>SCAR</i></b>	<b><i>Scientific Committee on Antarctic Research</i></b>
<b><i>UN</i></b>	<b><i>Economic Commission for Europe, Statistical Division</i></b>
<b><i>UN / FAO</i></b>	<b><i>Food and Agriculture Organization</i></b>
<b><i>UNGEGN</i></b>	<b><i>United Nations Group of Experts on Geographical Names</i></b>
<b><i>UNGIWG</i></b>	<b><i>United Nations Geographic Information Working Group</i></b>
<b><i>WMO</i></b>	<b><i>World Meteorological Organization</i></b>

# *Geospatial Industry*

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*Vendors – hardware & software*

*Corporate – commercial  
companies, systems integrators*

*Consumers – general public*



# *Spatial Data Infrastructures*

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*National - NSDI*

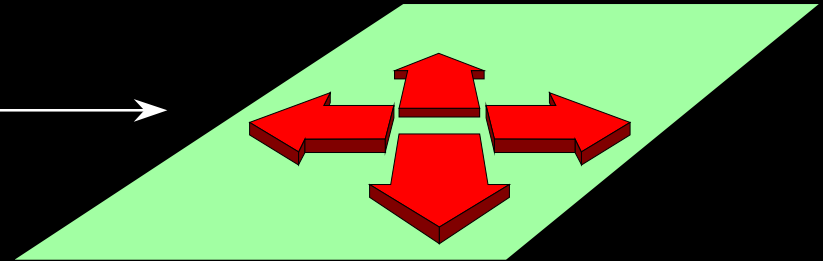
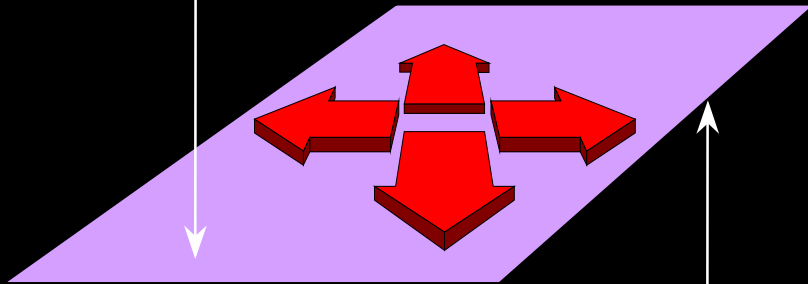
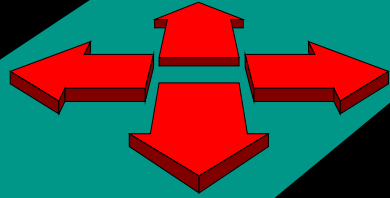
*Regional - RSDI*

*Global - GSDI*



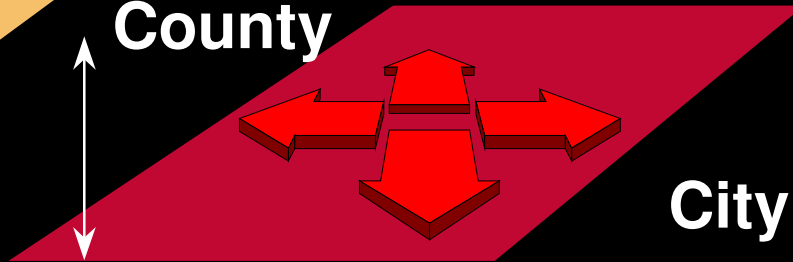
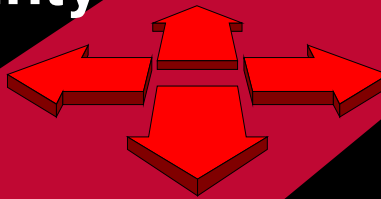
# *Spatial Data Infrastructures*

**Federal  
Government**



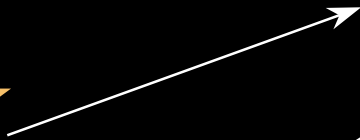
**State**

**County**

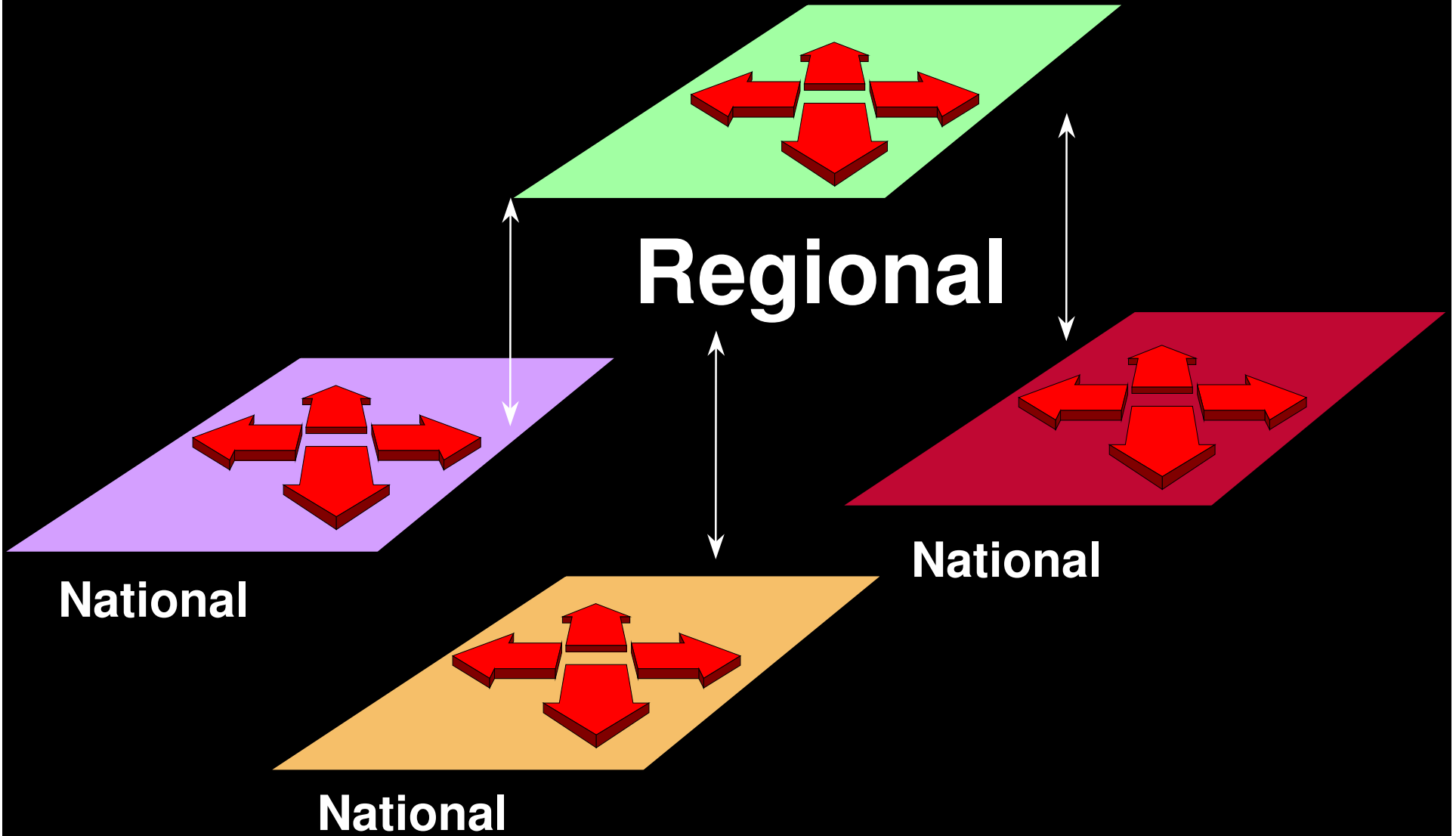


**City**

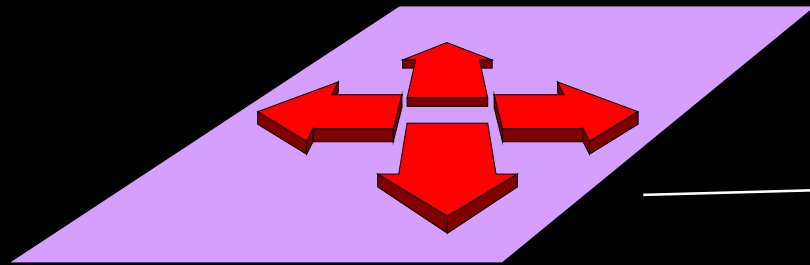
**National**



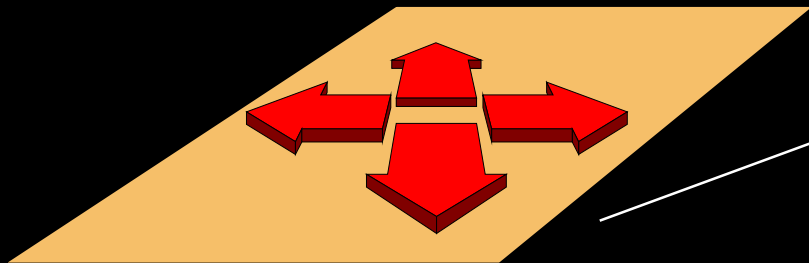
# *Spatial Data Infrastructures*



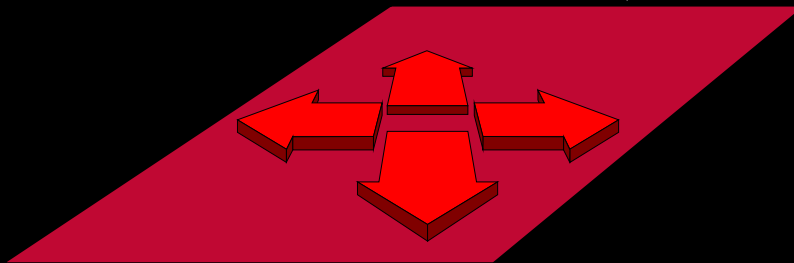
# *Spatial Data Infrastructures*



**Regional**



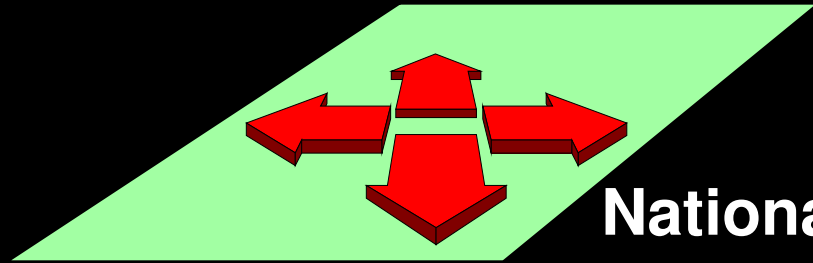
**National**



**Regional**



**Global**

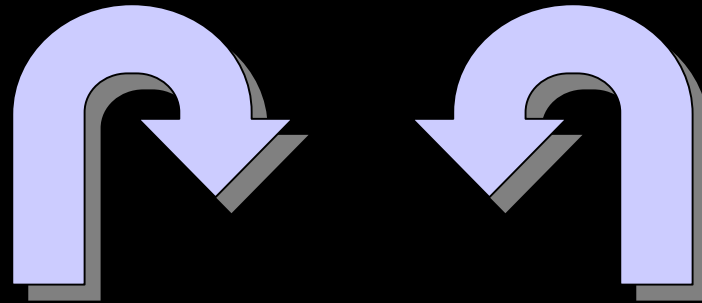


**National**



# *Standards & Spatial Data Infrastructure*

**Standards  
Infrastructure**



**Spatial Data  
Infrastructures**

**Standards**

**Global**

**Standards**

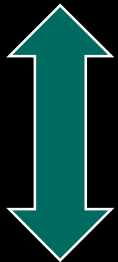


**Regional**

**Technology**

**National**

**Data policy**



**Sub  
National**

**Institutional  
framework**

**Interoperability**

**Mutually inclusive**

# ***Metadata Standard***

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## ***ISO 19115 – Metadata Standard***

***“information about data”***

***“provides information about the identification, the extent, the quality, the spatial and temporal schema, spatial reference, and distribution of digital geographic data”***

***information about the data and its:  
“ fitness for use ”***

***– metadata ensures the appropriate data for an application***

# *Related Metadata Standards*

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*ISO 19115-2 - Metadata Standard  
Part 2, Extensions for Imagery  
and Gridded Data*

*ISO 19139 – Metadata Standard,  
XML Schema Specification*

Defines **s**patial **m**etadata **XML**  
(**smXML**) encoding

# *Metadata Profile*

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**Profile** – subset of a base standard or a set of standards comprised of subset (s) and one or more base standards - **ISO 19106 - Profiles**

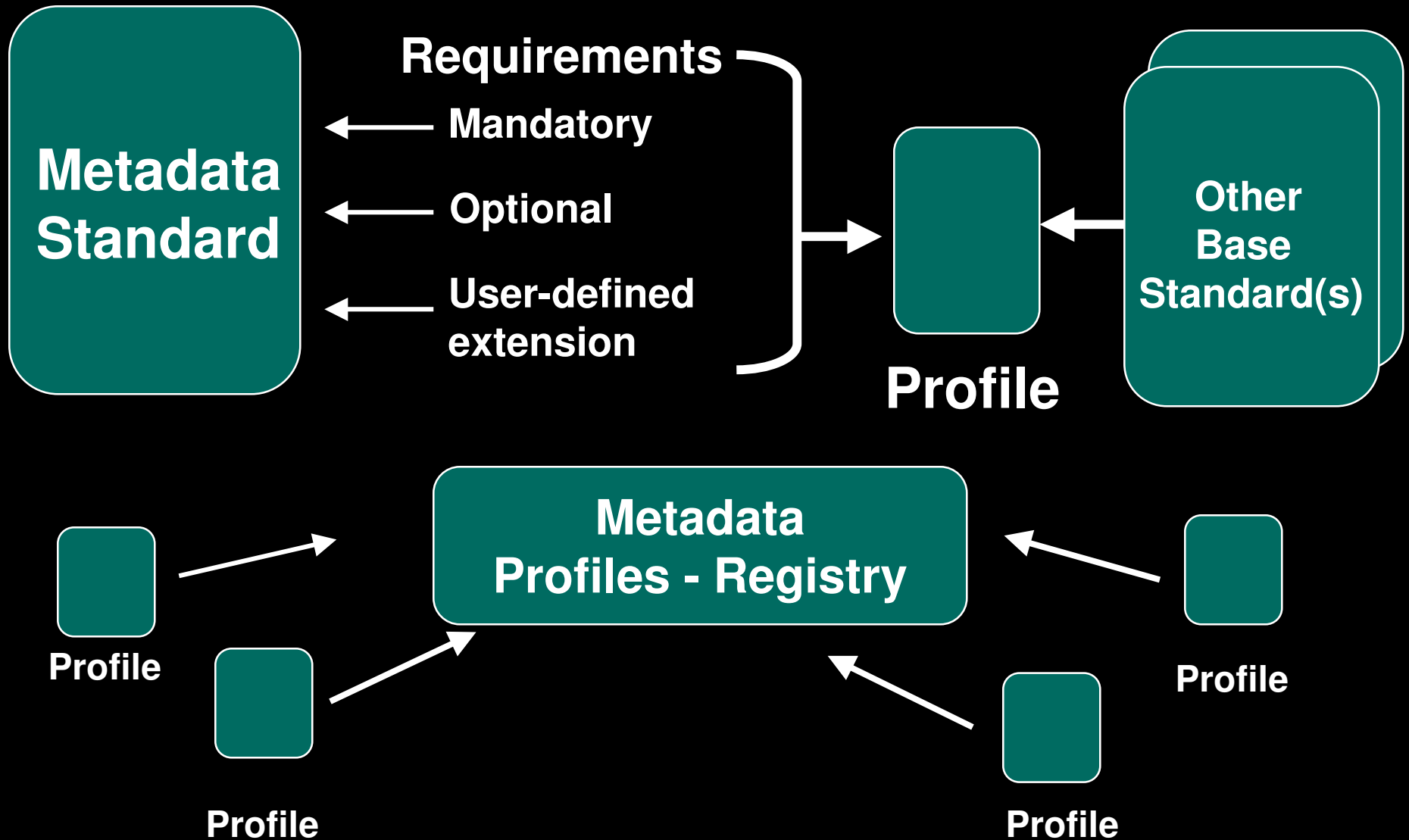
Profile of a base standard is **customized** for a particular:

information community,  
e.g., military & hydrographic organizations

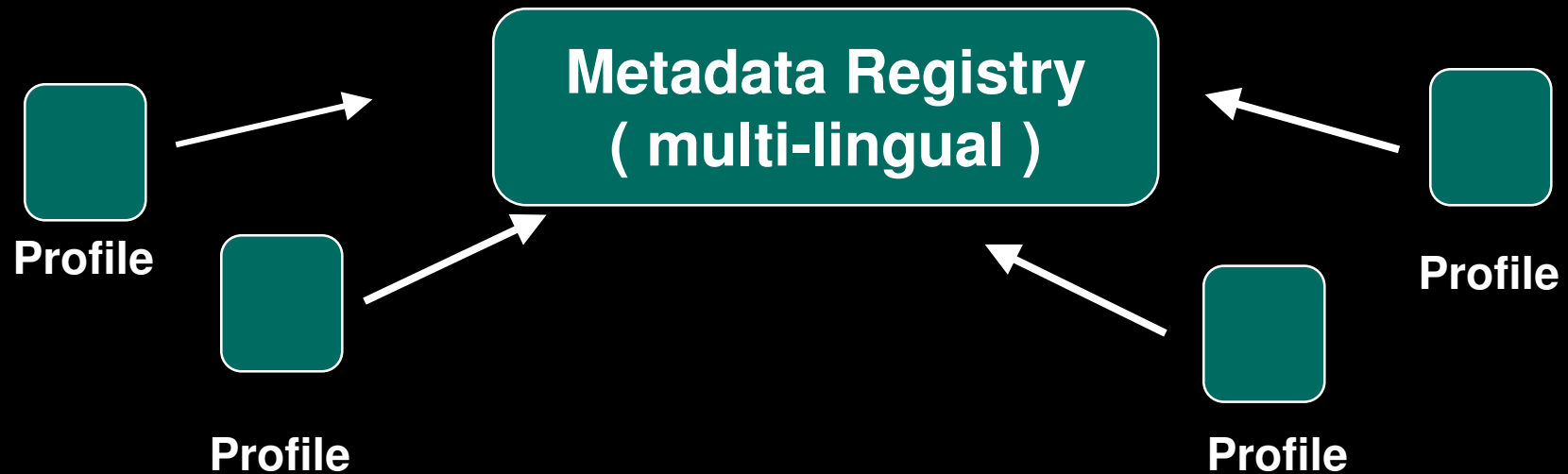
geographic region or language



# ISO Metadata Profiles & Registry



# *Metadata Registry - Multi-Lingual*



*Parallel lists data elements, linked by ID numbers, provide names and definitions in various languages – allowing for multi-lingual cross-references & equivalences.*

# *ISO Metadata Profiles*

**European Spatial Data Infrastructure**

**INSPIRE:**

***IN*frastructure for *SP*atial *Info*Rmation in *EU*rope**



**North American Metadata Profile**

***Canada and the United States of America***

**Latin American Metadata Profile ( LAMP )**

***Latin American countries – GSDI –9 ISO Standards Workshop***

# *ISO Metadata Profiles*

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**Digital Geographic Information Working  
Group ( DGIWG )**

*Member countries of the North Atlantic  
Treaty Organization ( NATO )*

**Other possible ISO Metadata Profiles:**

*UN Geographic Information Working  
Group*

*Permanent Committee on GIS  
Infrastructure for Asia and the Pacific  
( PCGIAP )*

# *Advisory Group on Outreach*

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Promoting the **awareness** of ISO / TC 211 standards and the **institutionalization** of these standards in major NGOs

## **Training and Education**

### **Workshops**

Outreach initiatives for the coordination of ISO Metadata Profiles - INSPIRE, DGIWG, North America, and Latin America .... **Asia and the Pacific?**

*Thank you !*



*My Coordinates:*

*Henry Tom*

*Co-Chair,*

*ISO/TC 211 Advisory Group on Outreach*

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