

Helping Integrate Global Observation Data with **Ontology and Metadata**

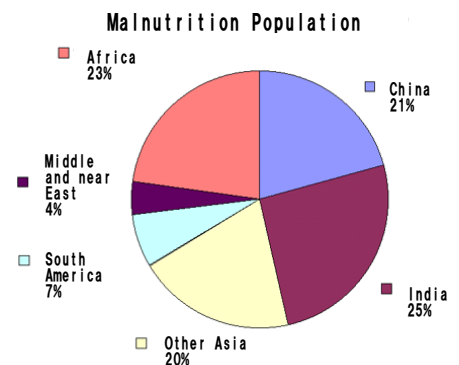
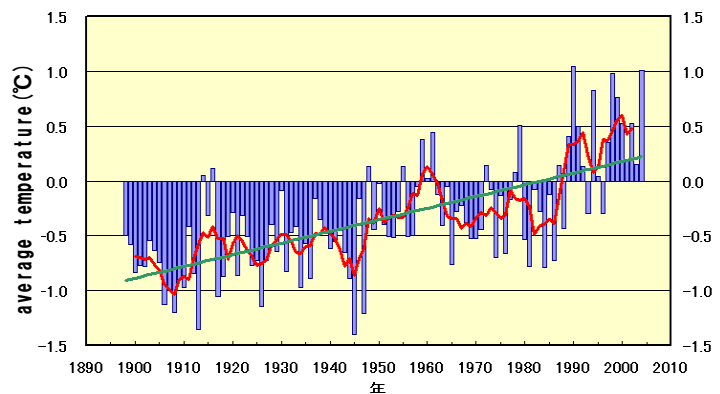
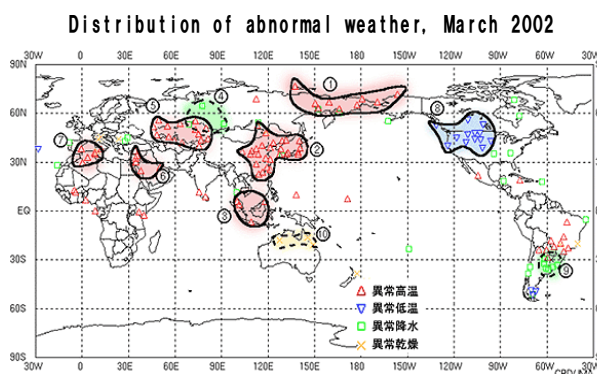
Ryosuke Shibasaki, the University of Tokyo
 Masahiko Nagai
 Shigenobu Tachizuka
 Takashi Oguchi
 Hiromichi Fukui, Keio University

The 3rd International Asian Water Cycle Symposium at Beppu, Japan

**abnormal weather, climate change,
flood damages, water or food crisis**



Poverty, health, safety



An understanding and prediction of an earth system



GEOSS 10 Year Plan

Summit

2003, June Evian
G8 Summit

2003, July Washington
1st Earth observation Summit

2004, April Tokyo
2nd Earth observation Summit

2005, February Brussel
3rd Earth observation Summit



Global Earth Observation System of Systems
(GEOSS)

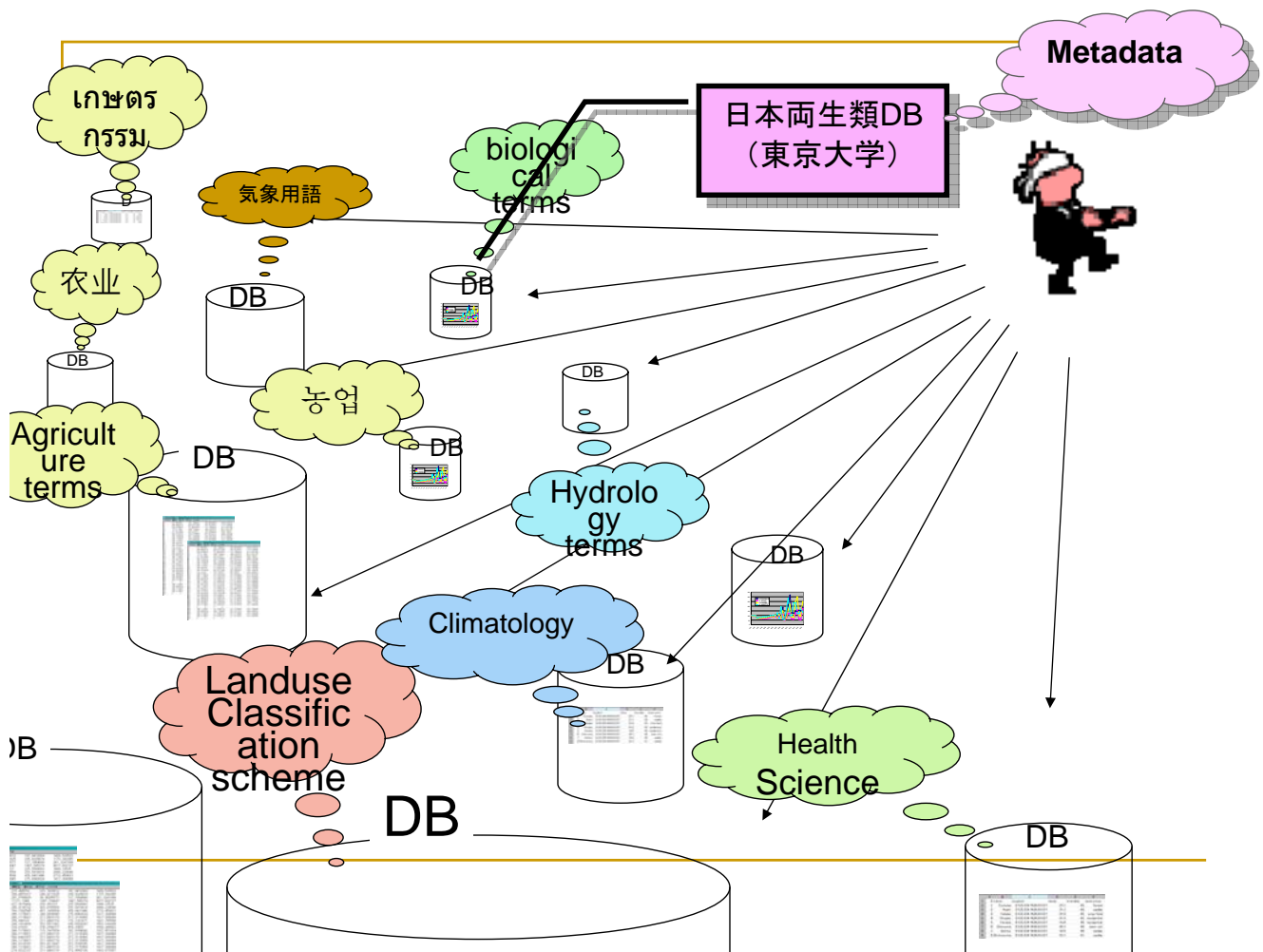
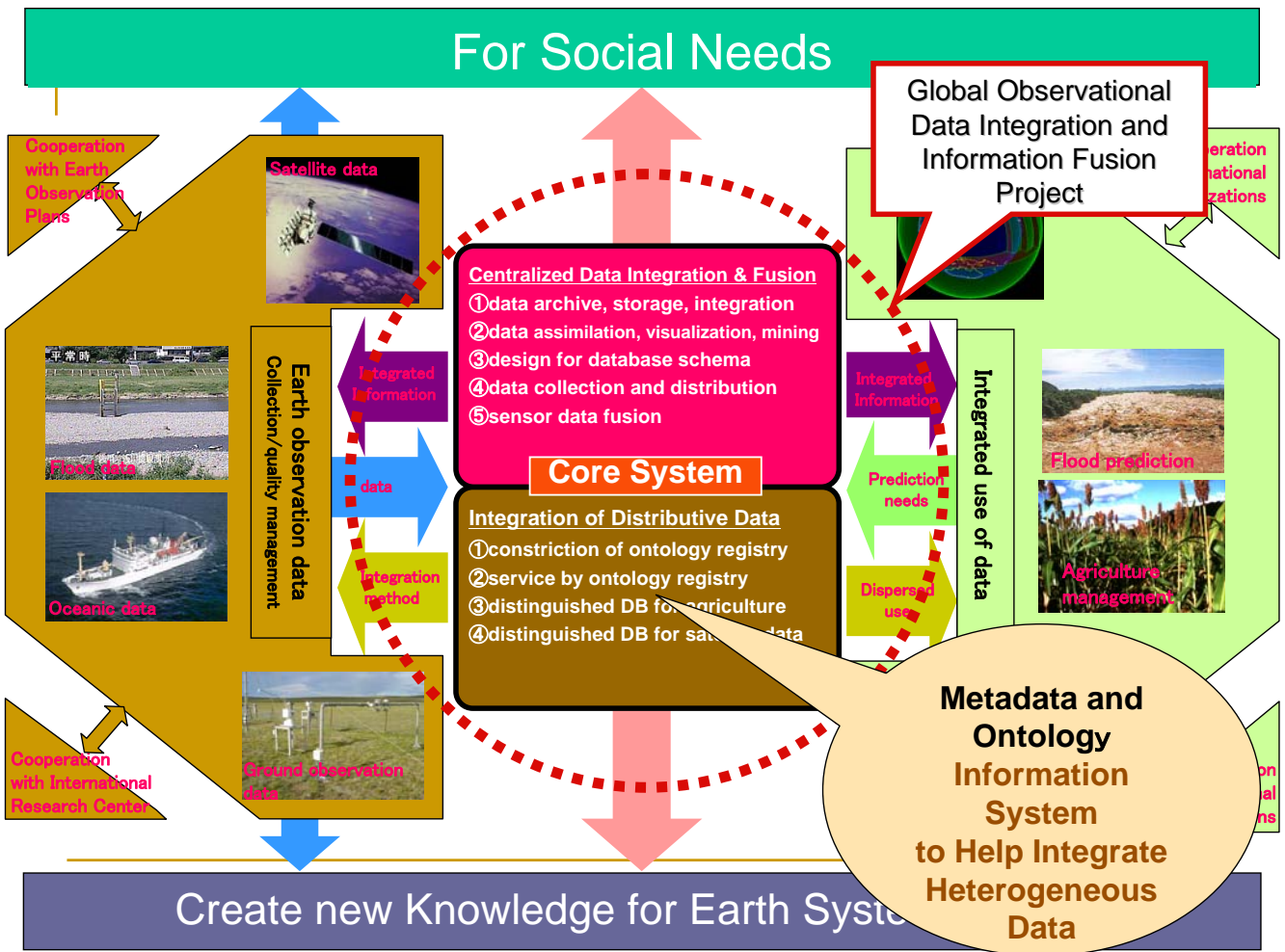
Mutual management and Data system

- Development and Acquisition for Common data, metadata, and product.
- Processing, Analyzing, Visualizing for Huge and variety of data
- Sharing and distribution by Internet service

Recommended Researches

- **Management of life cycle data**
- **Data integration and Information fusion**
- **Data mining**
- Network reinforcement
- Suitable planning





What is Ontology?

Philosophical word

The branch of **metaphysics** that deals with the nature of being.

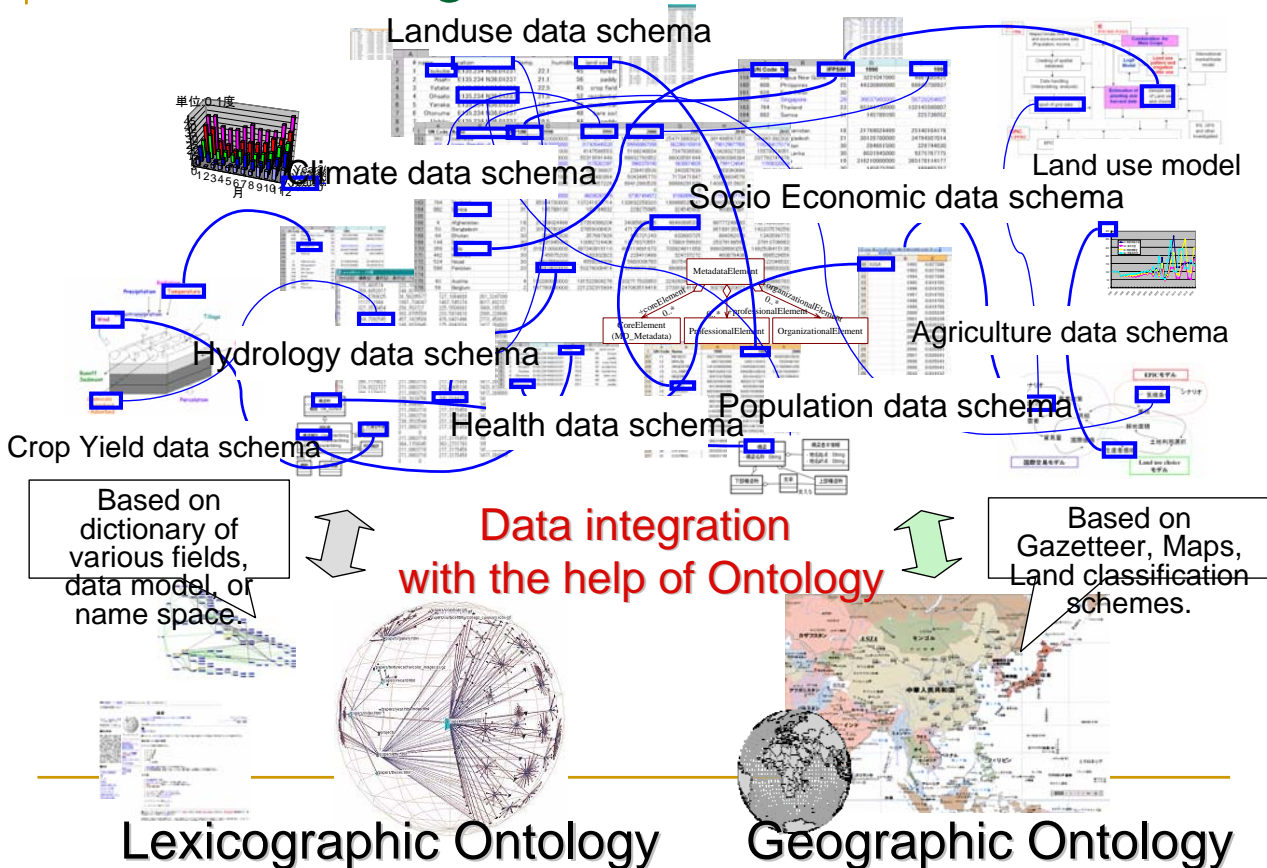
In the context of knowledge sharing

The term ontology means **specification of a conceptualization**.

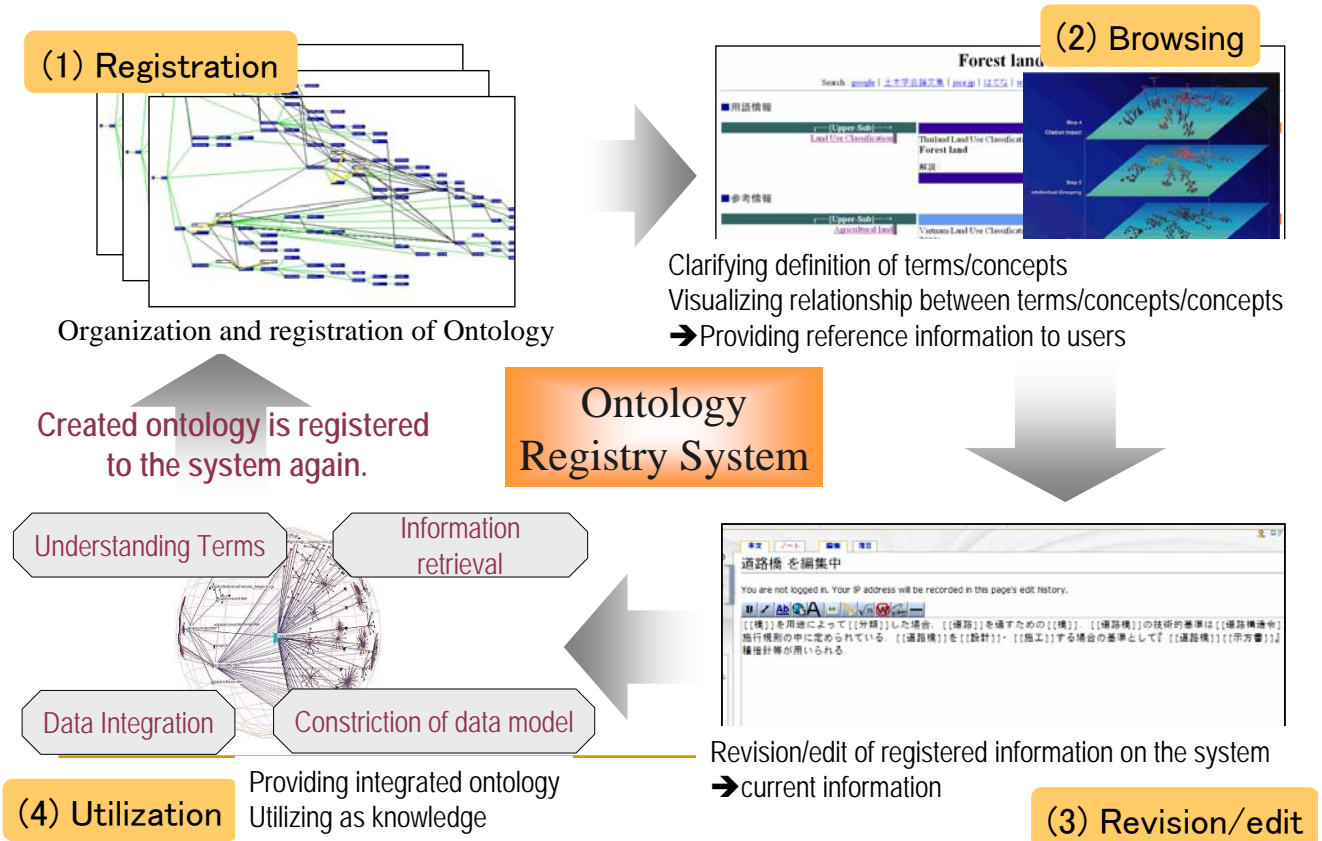
That is, ontology defines **the concepts and relationships** and provides a semantic basis for data and information

Information on definition of data and the relationships among them

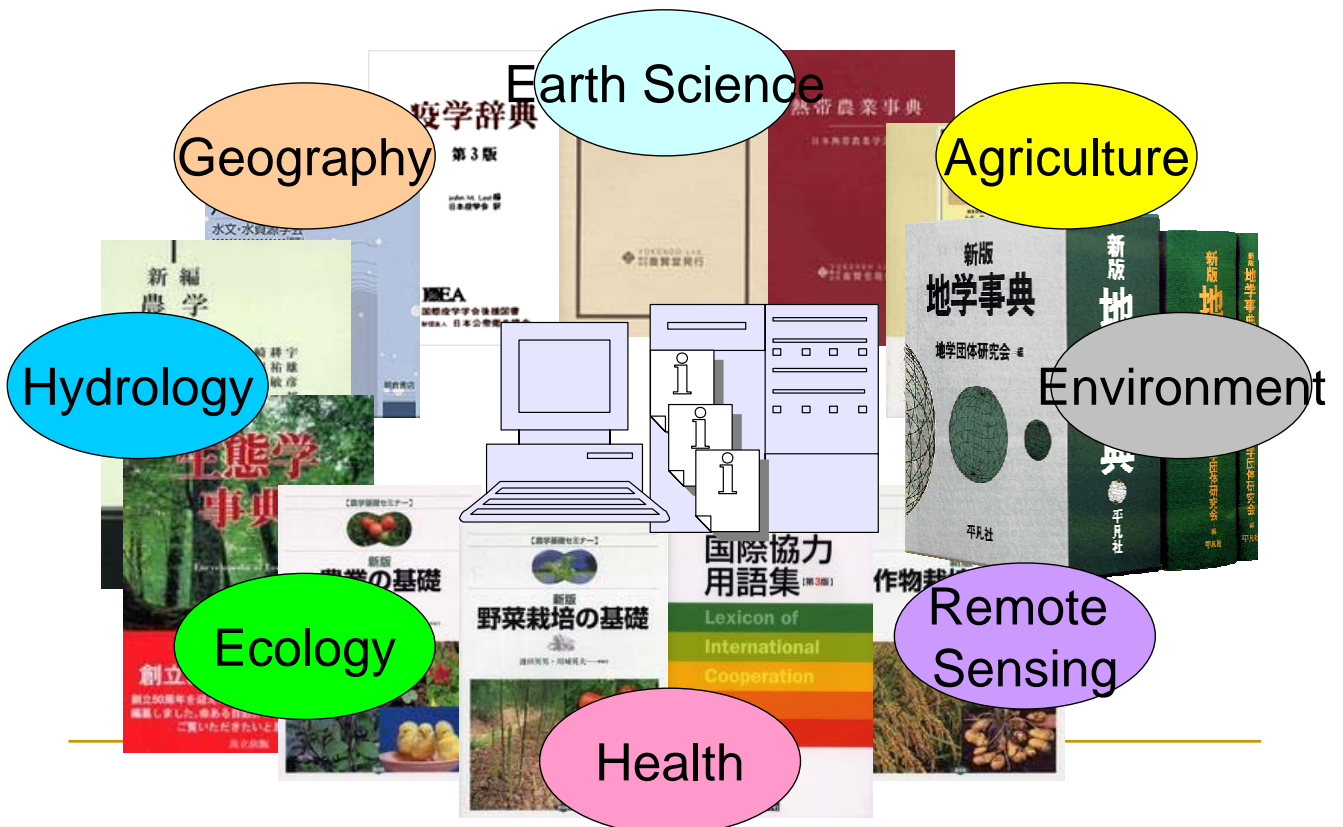
Use of Ontological Information



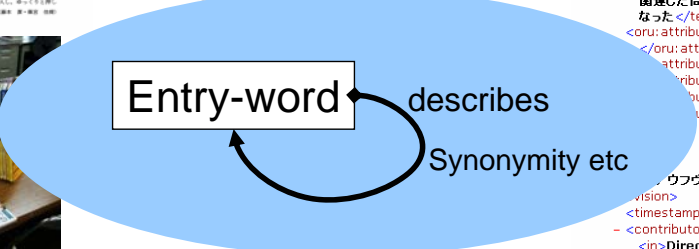
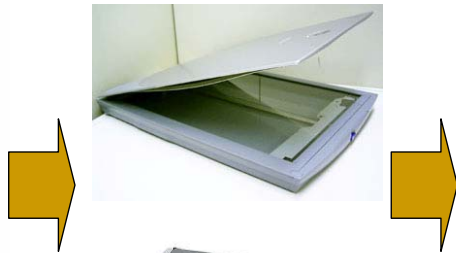
Framework of Ontology Registry System



Data collection from existing dictionaries



Digitizing paper dictionaries



```
<?xml version="1.0" encoding="utf-8" ?>
- <mediawiki xmlns="http://www.mediawiki.org/xml/export-0.3/"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:oru="http://shiba.iis.u-tokyo.ac.jp/oru/xml/export-0.1/"
  xsi:schemaLocation="http://www.mediawiki.org/xml/export-0.3/ http://www.mediawiki.org/xml/export-0.3.xsd"
  version="0.3" xml:lang="ja">
- <page>
- <title>IBP</title>
- <revision>
- <timestamp>2006-07-05T01:04:07Z</timestamp>
- <contributor>
- <ip>Direct Import</ip>
- </contributor>
- <contributor>
- </contributor>
- <text>1965年から10年間行われた国際生物学事業計画で、七つの部門から構成されていた。すなわち、(1)陸上生態系の生産力、(2)生産過程、(3)陸上生態系の自然保護、(4)陸水生態系の生産力、(5)海洋生態系の生産力、(6)天然資源の利用と管理、(7)人間への適応性である。特に生態系をうたったわけではないが、生態学的な野外調査や実験を土台にして、互いに比較可能なデータをとることに努力した。これらの基礎的資料により、地球上における人間の今後の生活を支える生物生産力の可能性を推定しようという考え方が根拠にあった。そのような背景はあったものの、これは国際学術連合会議(ICSU)の企画になる基礎科学的な研究を中核としたもので、より人間生活に関連した問題については次のMAB半計画で検討されることになった</text>
- <oru:attribute attr_name="読み">アイビー</oru:attribute>
- </oru:attribute>
- <oru:attribute attr_name="著者">沼田</oru:attribute>
- </oru:attribute attr_name="関連"/>
- <oru:attribute attr_name="ページ">1</oru:attribute>
- </oru:attribute attr_name="画像"/>
- </text>
- </revision>
- </page>
- </mediawiki>
```

Revision/edit with Semantic MediaWiki

東京

東京は、**日本** の首都です。そして日本で最も大きな都市です。Tokyo is written as **東京** in Japanese. 1,000,000 石原慎太郎

Facts about 東京 — Click + 🔍 to find similar pages. View as RDF

| Relations to other articles | |
|-----------------------------|---------------|
| Capital of | 日本 + 🔍 |
| Attribute values | |
| Population | 1,000,000 + 🔍 |
| Governor | 石原慎太郎 + 🔍 |

カテゴリ: City

Facts about 東京 — Click + 🔍 to find similar pages. View as RDF

プライバシー・ポリシー Smwikiについて 免責事項

Table Editor helping provide structured description

snw table editor

見出し語 Tokyo

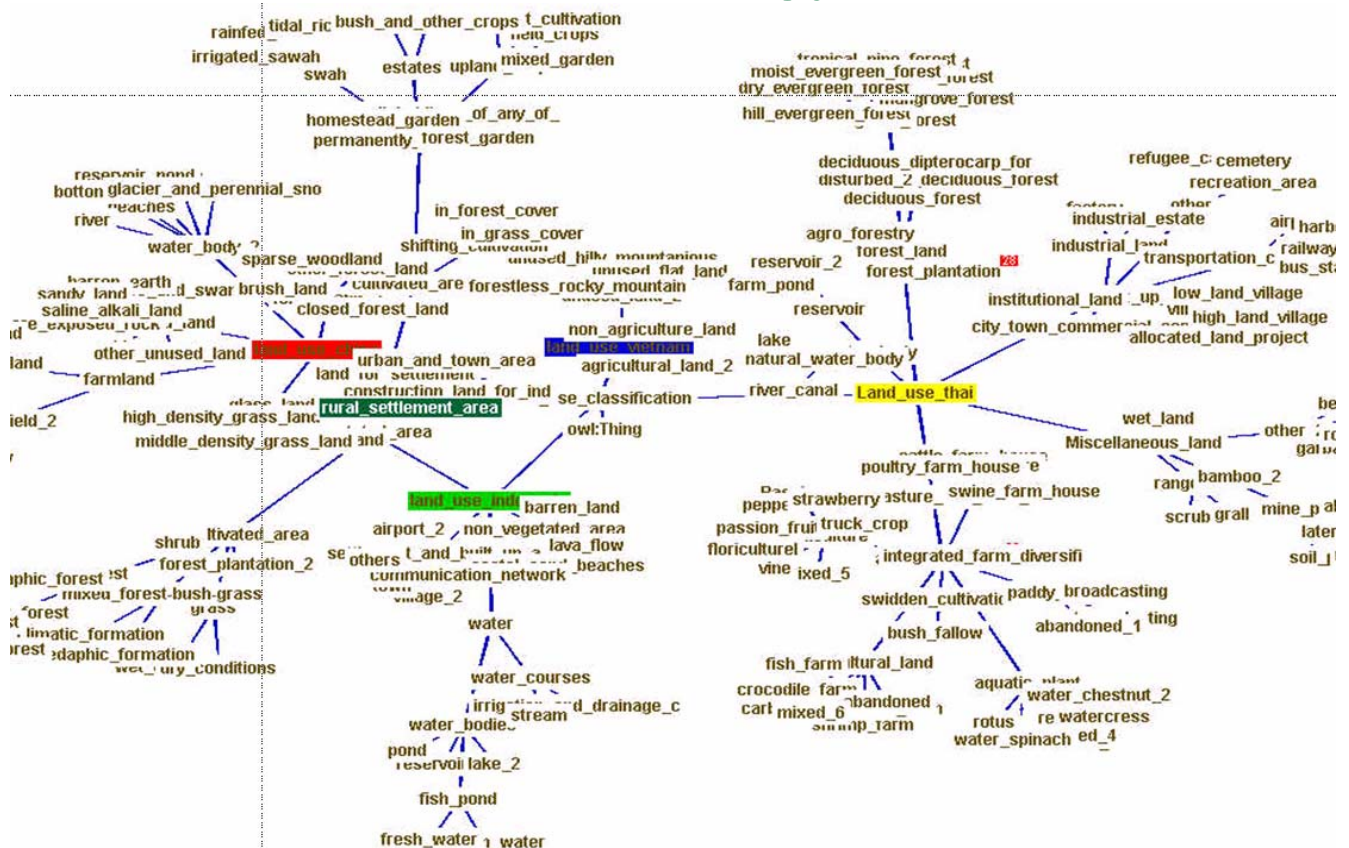
見出し語説明 Tokyo is capital of [[Capital of::Japan]] and the largest city in Japan. Tokyo is written as [[東京]] in Japanese.

| 関係 | 関係記述タグ | op | 説明 |
|-------|---------------------------|----|-----------------------|
| 人口 | Population | = | 人口 |
| 知事 | Governor | = | 知事 |
| カテゴリー | Category | : | カテゴリー 知事 |
| 表記ゆれ | Orthographic variation of | :: | 表記の異なる用語。 「クジラ」に対する「 |
| 略語 | Abbreviation of | :: | 見出し語の省略形。 「国際連合」に対す |
| 同義語 | Synonym of | :: | ある言語の同じ概念を意味する用語。す |

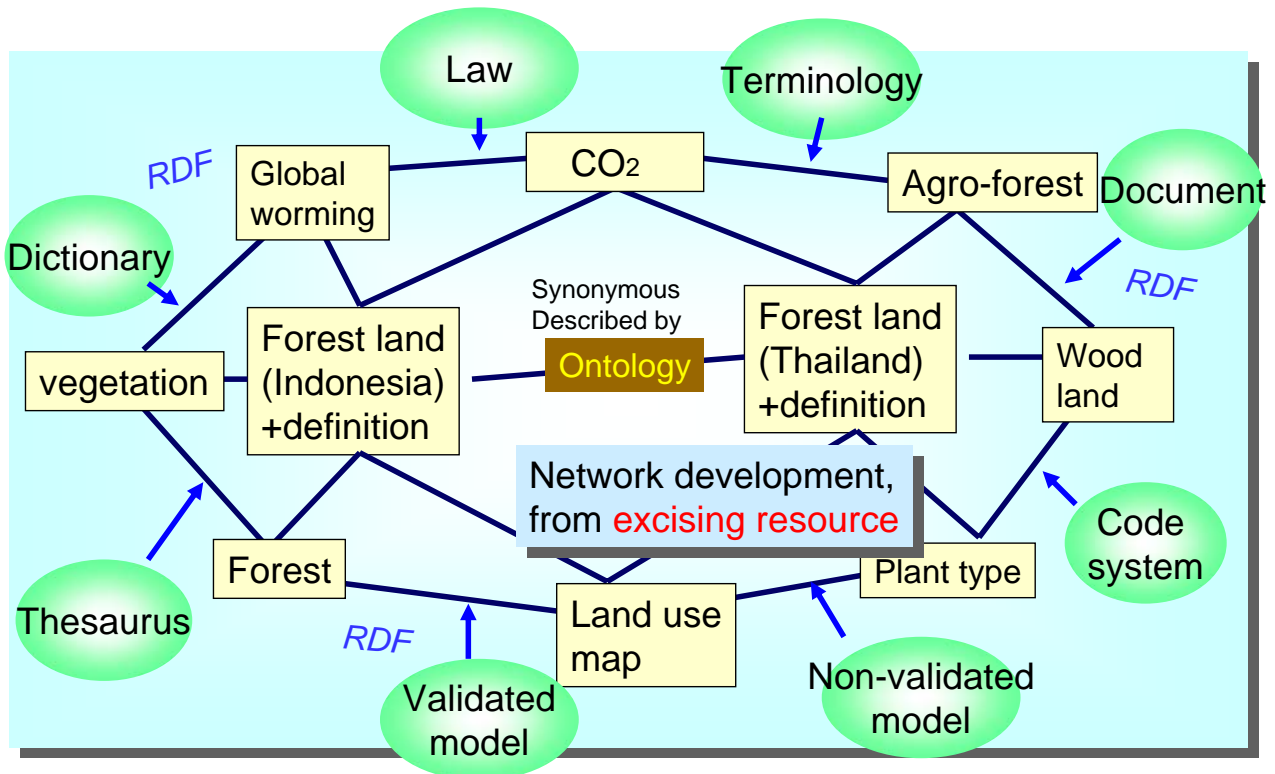
| 関係 | 関係記述タグ | op | 見出し語 |
|--------|---------------------------|----|-------------------|
| 人口 | Population | = | 1,000,000 |
| 知事 | Governor | = | Shintaro Ishihara |
| カテゴリー | Category | : | city |
| カタカナ表記 | Katakana phonetic scripts | :: | トウキョウ |
| 全体語 | Holonym of | :: | 日本 |

閉じる 更新

Visualization of ontology



Semantic Network connecting Terms



Collection of Gazetteers

GEOnet Names Serve

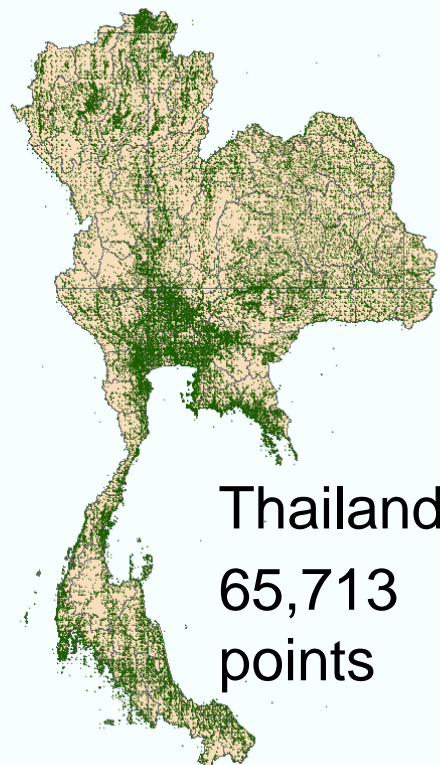
Names Files of Selected Countries

- Geographic Area of Coverage: Worldwide excluding the United States and Antarctica
- The files contain names for all types of features.
- Description of fields in country files.
- Names are in reading order.
- Data is in tab-delimited text UTF-8 (ISO/IEC 10646 (UNICODE) Compliant format).
- Date Generated indicates when the file was generated from the database.
- Most Recent Modification Date indicates when any entry in the file was last modified.
- Most Recent Source Date indicates when the source used to verify the name spelling was published.
- Files are in compressed zip format.
- To download a country, click on its name under the Country File column.
- Download a single compressed (.zip) file that contains the entire country files dataset - ~190MB compressed, ~760MB uncompressed, generated on 2006-03-01 (generated approximately once per month).

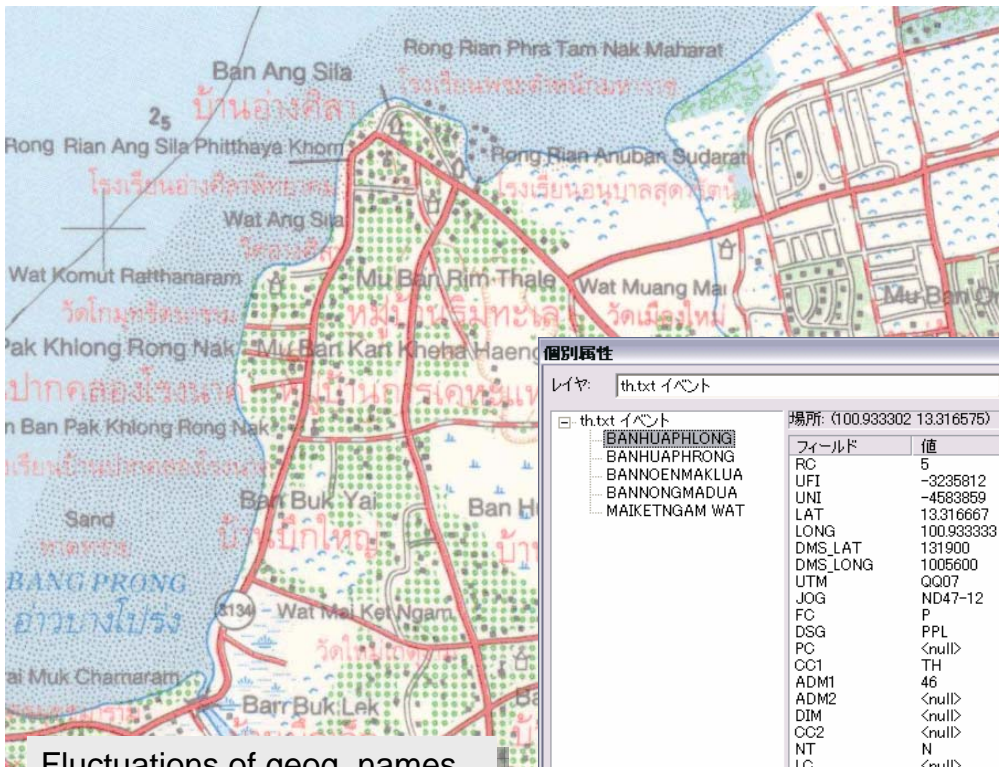
The country files are also available on our [ETD](#) site. The files have the same name, date, size, and file type.

Index

| Country | Country Code | Date Generated | Most Recent Modification Date | Most Recent Source Date |
|---|--------------|----------------|-------------------------------|-------------------------|
| Afghanistan (Last-EOCnet Home Page) | AF | 2006-03-06 | 2006-03 | 2006-02 |
| Albania | AL | 2005-04-04 | 2005-03 | 2003-08 |
| Algeria | AG | 2006-01-17 | 2006-01 | 2005-07 |
| Andorra | AN | 2004-10-30 | 2004-05 | 2005-08 |



- Landuse
- Landmark
- Geography



Fluctuations of geog. names

- Ban Hua Phrong
- Ban Hua Phlong

個別属性

レイヤ: th.txt イベント

場所: (100.933302 13.316575)

| フィールド | 値 |
|--------------|----------------|
| RC | 5 |
| UFI | -3235812 |
| UNI | -4583859 |
| LAT | 13.316667 |
| LONG | 100.933333 |
| DMS_LAT | 131900 |
| DMS_LONG | 1005600 |
| UTM | QQ07 |
| JOG | ND47-12 |
| FC | P |
| DSG | PPL |
| PC | <null> |
| CC1 | TH |
| ADM1 | 46 |
| ADM2 | <null> |
| DIM | <null> |
| CC2 | <null> |
| NT | N |
| LC | <null> |
| SHORT_FORM | <null> |
| GENERIC | <null> |
| SORT_NAME | BANHUAPHLONG |
| FULL_NAME | Ban Hua Phlong |
| FULL_NAME_ND | Ban Hua Phlong |
| MODIFY_DATE | 1994/04/06 |
| Shape | Point |

Revision/edit of gazetteer by Google map

地図コンテンツ管理ページ - Microsoft Internet Explorer

アドレス http://157.82.154.154:8080/nagai/google/admin/admin.html

登録地域一覧 選択

地域を選択 選択した地域を削除

地域新規登録

地域名:

中心緯度:

中心経度:

ズーム:

追加

選択した場所を編集 選択した場所を削除

ランドマーク編集

場所名:

緯度:

経度:

リンク先URL:

イメージ:

説明:

ページが表示されました

インターネット

Participatory Field Survey of Exotic Invasive Bees



Bombus terrestris

Visualization with Google Maps

| | 調査番号(小) | 調査番号(大) | 開始日 | 終了日 | 入力者情報 | 住所(ハチ) | 緯度(ハチ) | 経度(ハチ) | 環境(ハチ) | 種名(ホ) | 住所(ホ) | 種名(植物) | 住所(植物) |
|-----|---------|---------|------|-----|-------|------------|--------|---------|--------|-------|-------|---------|--------|
| コピー | 詳細 | 1009 | 1003 | | | 別海町野付 野付半島 | 43.613 | 145.258 | | | | | |
| コピー | 詳細 | 1010 | 1003 | | | 別海町野付 野付半島 | 43.569 | 145.347 | | | | | |
| コピー | 詳細 | 3904 | | | | | | | | | サクラソウ | 北海道むかわ町 | |

Future Prospects

- “Sustainable” development/revision of dictionary
 - → Wiki: Revision of dictionary + tool for specialist
 - Collaboration with scientific/academic societies
- User interface for easy/natural input and use of structured ontological information.
 - How to write ?
 - simple : for student, for specialist
 - Homonym, synonym, keyword, relational word
 - Figures and equations
 - How to use?