Historical Gazetteer Elements: Temporal Frameworks

Symposium on Space-Time Integration in Geography and GIScience

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Extending Gazetteers with Time and Entity Relationships

Next Generation Gazetteer

Place Names - Footprints
- Name Authorities
- Historical GIS
- Aggregators (geonames)

Chronologies
- Administration Periods
- Timelines (of events)
- Named Time Period Index

Entity Definitions
- GBHGIS - AUO
- Pleiades - Hist Place
- CHGIS - Hist Instance
- EDGIS - STP

Placenames Footprints
Time Periods
Schema to model Change Over Time
Generic Gazetteer Entity Model

Gillies - Pleiades

Southall - GBHGIS - AUO

Hill - ADL
Date Element Example: ADL

Alexandria Digital Library (ADL)

required: **status** (current, former, proposed)
optional: **dates** (begin and end dates), **date descriptions** (time periods, etc)

application: to feature
to placename
to spatial location
to classifications
to relationships between places
to data associated with a place

allows for: linking to external schema for named time periods

ADL notes: “there doesn’t seem to be an external standard for the representation of time that covers the needs of the gazetteer.”
Date Element Examples: GBHGIS

Great Britain Historical GIS - Administrative Unit Ontology

required: **date object** (for source reference)
optional: **date object** (begin and end dates of status, name, footprint)

Application:

- **status** (indicator of administrative unit status)
- **name** (allows for multiple spellings, or changes of name)
- **footprint** (allows for multiple attestations about locations, or changing footprints)
Gazetteer Entity Model - Other Cases

CHGIS

Mostern & Meeks - Song Gaz
Date Element Examples:  CHGIS

China Historical GIS

required:  **begin_date**,  **end_date**  (for each instance and each relationship)

Application:

**instances**  (unique for any change of Placename, Status, Footprint)
**part-of relationships**  (indicating administrative parents)

Related chronology:

**reign periods**  (lookup table based on calendar year)

API:

```plaintext
chgis.hmdc.harvard.edu/xml/placename/id/
chgis.hmdc.harvard.edu/xml/query/placename/year/
```

```plaintext
http://chgis.hmdc.harvard.edu/xml/query/lanzhou/1820
```
<item id="9536">
  <placename>
    <name_romanized>Lanzhou Fu</name_romanized>
    <name_vernacular>兰州府</name_vernacular>
    <name_alternate>蘭州府</name_alternate>
  </placename>
  <feature_type>
    <type_english>prefecture</type_english>
    <type_romanized>Fu</type_romanized>
    <type_vernacular>府</type_vernacular>
    <type_id>84</type_id>
  </feature_type>
  <temporal>
    <begin_year>1820</begin_year>
    <begin_year_rule>9</begin_year_rule>
    <end_year>1820</end_year>
    <end_year_rule>9</end_year_rule>
  </temporal>
  <spatial>
    <object_type>point</object_type>
    <coordinate_type>point location</coordinate_type>
    <degrees_latitude>36.047031</degrees_latitude>
    <latitude_direction>N</latitude_direction>
    <degrees_longitude>103.847137</degrees_longitude>
    <longitude_direction>E</longitude_direction>
    <present_location>甘肃兰州市</present_location>
  </spatial>
  <evidenced_by>
    <source_note>
      <note_type>administrative seat</note_type>
      <note_id>25000</note_id>
    </source_note>
  </evidenced_by>
  <links>
    <webpage source="google_map">http://maps.google.com/maps?q=36.047031,103.847137(lanzhou)&amp;spn=0.1,0.1&amp;t=m&amp;hl=e&amp;z=9</webpage>
  </links>
</item>
Geo-parsing

associating references (Place Names) with geospatial footprints

leveraging gazetteers **works:**

  gazetteer elements: name, classification, footprint
Geo-parsing Example: Geonames

Jan 2011 - 25 million requests per day (50% Smartphones)

API: api.geonames.org/search?
   api.geonames.org/search?name=placitas&maxRows=10&username=demo

   q
   name
   name_equals
   name_startsWith
   maxRows
   startRow
   country
   countryBias
   continentCode
   adminCode1, adminCode2, adminCode3
   featureClass
   featureCode
   lang
   type (xml, json, rdf)
   style
   isNameRequired
   tag
   operator
   charset
   fuzzy
### Extending Geonames With Dates

#### geoname
- geonameid int
- name varchar(200)
- asciiName varchar(200)
- alternatenames varchar(6000)
- latitude float
- longitude float
- fclass char(1)
- fcode varchar(10)
- country varchar(2)
- cc2 varchar(80)
- admin1 varchar(20)
- admin2 varchar(80)
- admin3 varchar(20)
- admin4 varchar(20)
- population bigint
- elevation int
- gtopo30 int
- timezone varchar(40)
- moddate date

#### alternate name
- alternatenameId int
- geonameid int
- isoLanguage varchar(7)
- alternateName varchar(300)
- isPreferredName boolean
- isShortName boolean
- isHistoricalName boolean
- existDate date
- endDate date
- srcCiteName varchar(300)
- srcCiteLink varchar(300)
Geo-parsing

associating references (Place Names) with geospatial footprints

leveraging gazetteers works:

gazetteer elements: name, classification, footprint

GeoTemporal-parsing

associating references (Place Names, events) with temporal footprints

leveraging gazetteers doesn't work:

gazetteer elements: dates are optional or entirely missing
Time Periods Authority to merge Chronologies?

eamples:

**Named Time Period Directory**  (Petras, Larson, Buckland)

**Dharma Drum Time Authority**  (Bingeheimer, Wiles)

**Common Eras**  (Erikson, et al)
Roman Empire Chronology  [-0753] to [1453]

-- United Roman Empire  [-0027] to [0395]

---- Caligula  [0041] to [0054]

United Roman Empire

-- Thracia

---- Hadrianopolis

Ideally working from either point of entry
Linked Data - geo / chrono

moving toward ontologies of spatial features stored as triples (RDF), or deliverable via APIs

lacking in ontologies of temporal features (named time periods)

how will the spatial and temporal instances interact?

if you were to develop your own schema for handling the temporal element, how would you do it?
we welcome your proposals for:

- articles for a special journal
- a collaborative website / wiki
- ideas for building a global historical gazetteer