



Arts & Humanities
Research Council



Investigating ancient places in a digital environment

Hestia2 Southampton workshop: Exploring spatial networks through ancient sources

Elton Barker (The Open University)

Stefan Bouzarovski (University of Birmingham)

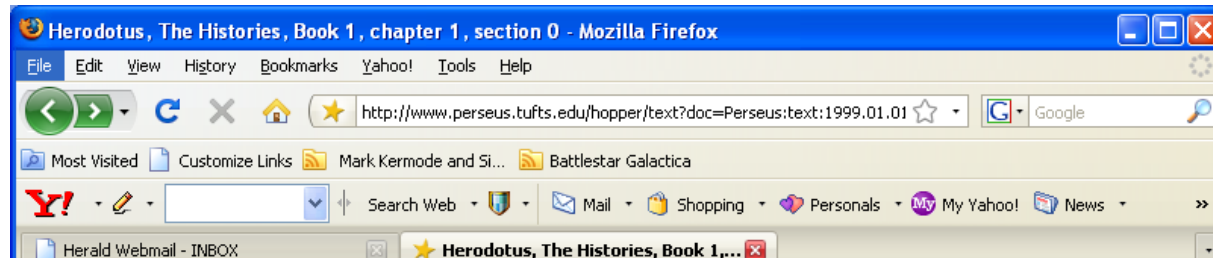
Leif Isaksen (University of Southampton)

18 July, 2013 | Archaeological Computing Research Group, University of Southampton

The problem? | Mapping the *Histories*



Strategy I | The Digital Text



132 <milestone n="1" unit="chapter"/><milestone n="0" unit="section"/>
133 <milestone unit="para"/>This is the display of the inquiry of <name
133 type="pers">Herodotus</name> of <placeName
133 key="tgn,7016142">Halicarnassus</placeName>, so that things done by man not be
133 forgotten in time, and that great and marvelous deeds, some displayed by the <name
133 type="ethnic">Hellenes</name>, some by the barbarians, not lose their glory,
133 including among others what was the cause of their waging war on each other.
134 <milestone n="1" unit="section"/>
135 <milestone unit="para"/>The <name type="ethnic">Persian</name> learned men say that
135 the <name type="ethnic">Phoenicians</name> were the cause of the dispute. These (they
135 say) came to our seas from the sea which is called Red,<note anchored="true"
135 resp="#ed">Not the modern <placeName key="tgn,7016791">Red Sea</placeName>, but the
135 <placeName key="tgn,7016761">Persian Gulf</placeName> and adjacent waters.</note>
135 and having settled in the country which they still occupy, at once began to make long
135 voyages. Among other places to which they carried <name type="ethnic">Egyptian</name>
135 and <name type="ethnic">Assyrian</name> merchandise, they came to <placeName
135 key="perseus,Argos">Argos</placeName>,



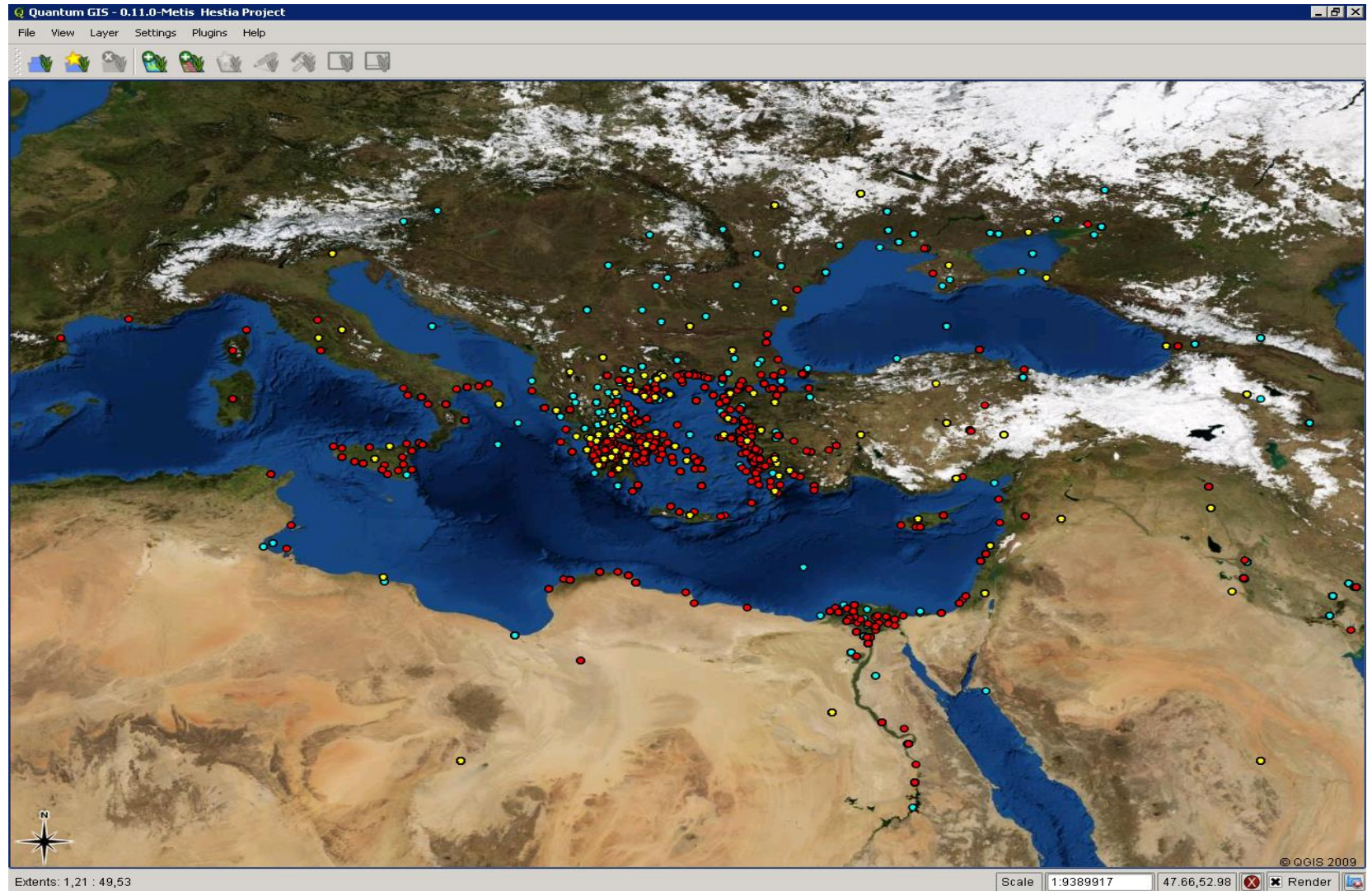
Results | A Database of Toponyms



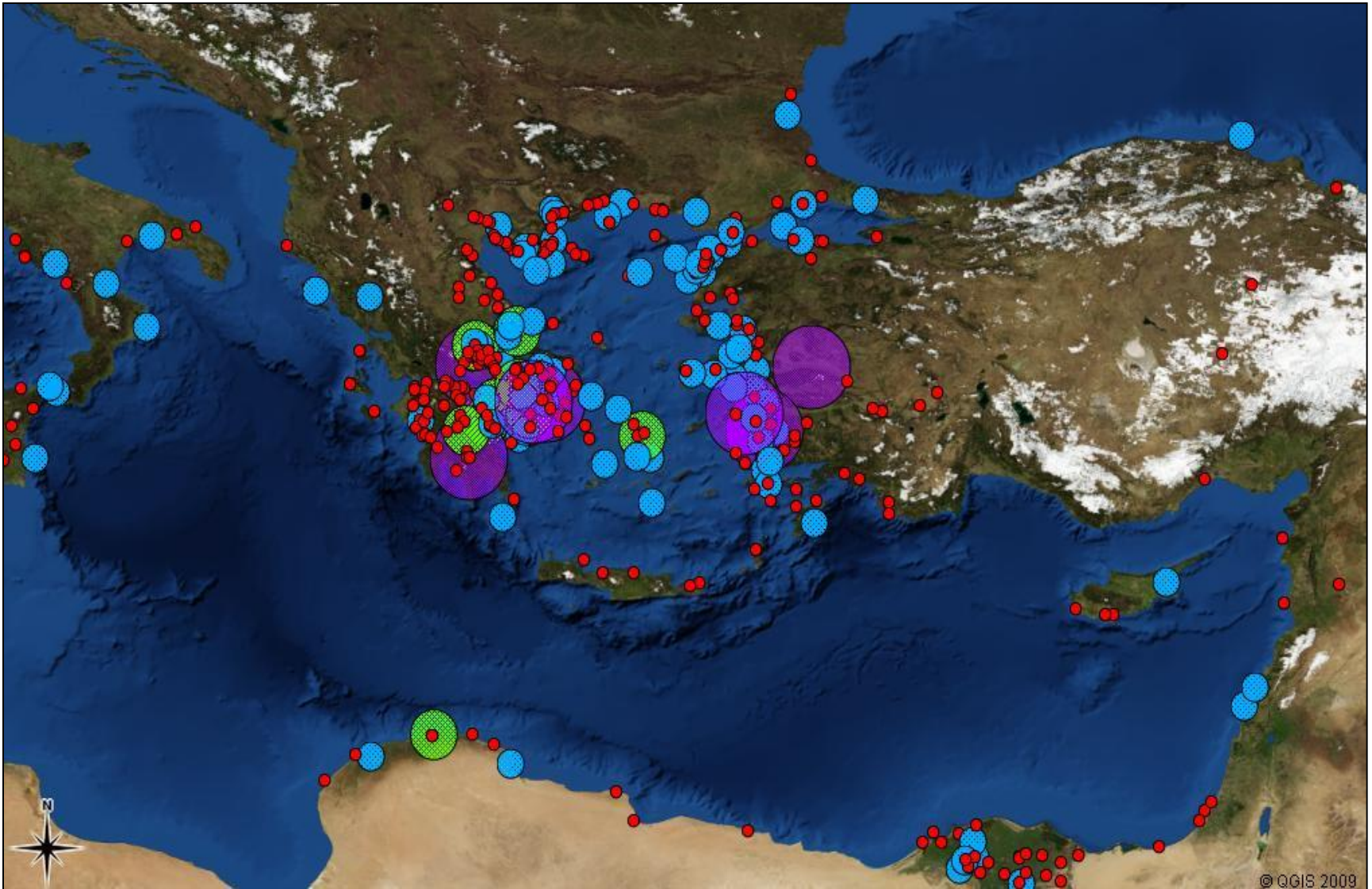
	loc_id [PK] integer	source character var	source_id character var	lon double precis	lat double precis	normal character var	loc_type character var	info character var	geom geometry	geometry geometry
1	1	hestia	Halicarnassus	27.466	37.5	Halicarnassus, E	inhabited place	Caria		0101000020E
2	2	hestia	Argos	22.7333	37.6417	Argos	inhabited place	Peloponnese		0101000020E
3	3	hestia	Greece	22	39	Greece	country	Europe		0101000020E
4	4	hestia	Egypt	30	27	Egypt	country	Africa		0101000020E
5	5	hestia	Tyre	35.183	33.266	Tyre, Al-Janub	inhabited place	Phoenicia		0101000020E
6	6	hestia	Phoenicia			Phoenicia	country	Asia		
7	7	hestia	Aea			Aia/Nesos	inhabited place	Colchis		0101000020E
8	8	hestia	Colchis	41.683	42.183	Colchis, Poti	region	Colchis, Asia		0101000020E
9	9	hestia	Asia			Asia	continent	Asia		
10	10	hestia	Europe			Europe	continent	Europe		
11	11	hestia	Troy	26.2833	39.9167	Troy	inhabited place	Troad		0101000020E
12	12	hestia	Halys river			Halys River	river	Asia		
13	13	hestia	Syria	38	35	Syria	country	Asia		0101000020E
14	14	hestia	Paphlagonia			Paphlagonia	region	Asia		
15	15	hestia	Black Sea	38	42	Black Sea, Euxir	sea	Asia		0101000020E
16	16	hestia	Ionia			Ionia	region	Europe		
17	17	hestia	Sardis			Sardis	inhabited place	Lydia		0101000020E
18	18	hestia	Lydia	27.516	38.683	Lydia	country	Asia		0101000020E
19	19	hestia	Parus			Paros	island	Aegean		0101000020E
20	20	hestia	Delphi	22.5167	38.4917	Delphi	oracle	Phocis, Central		0101000020E

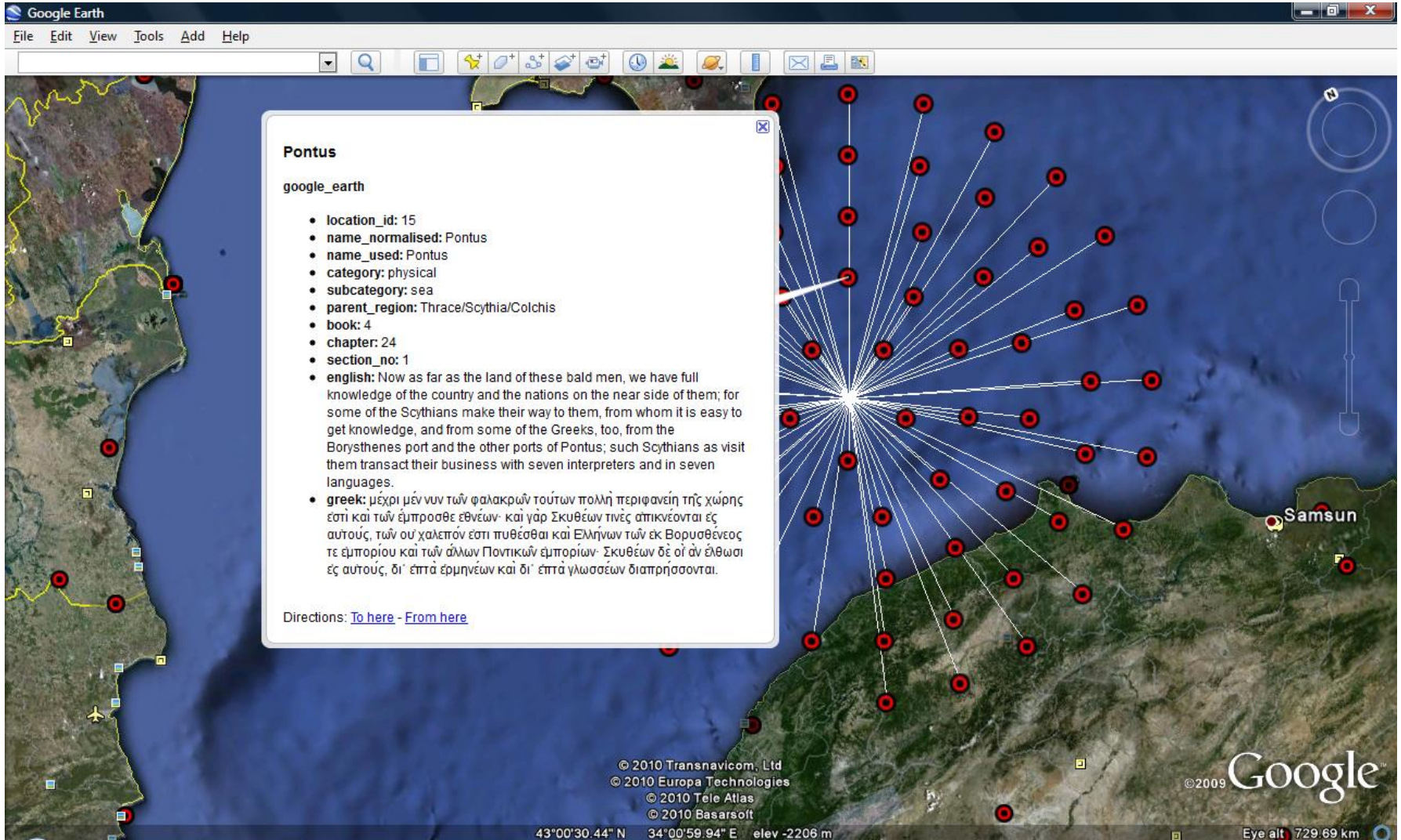
844 rows.

Analysis | GIS: all places



Analysis | GIS: reference count of settlements



The image shows a screenshot of the Google Earth application. The main map displays the Black Sea region, with a network of red dots connected by white lines, radiating from a central point. A pop-up window titled 'Pontus' is open, displaying metadata and a description in both English and Greek. The window includes fields for 'location_id', 'name_normalised', 'name_used', 'category', 'subcategory', 'parent_region', 'book', 'chapter', and 'section_no'. It also contains a paragraph of English text and a paragraph of Greek text. At the bottom of the window, there are links for 'Directions: To here - From here'. The Google Earth interface includes a menu bar (File, Edit, View, Tools, Add, Help), a toolbar with various icons, and a status bar at the bottom showing coordinates (43°00'30.44" N, 34°00'59.94" E) and elevation (-2206 m). The Google logo and copyright information are visible in the bottom right corner.

Pontus

google_earth

- location_id: 15
- name_normalised: Pontus
- name_used: Pontus
- category: physical
- subcategory: sea
- parent_region: Thrace/Scythia/Colchis
- book: 4
- chapter: 24
- section_no: 1
- english: Now as far as the land of these bald men, we have full knowledge of the country and the nations on the near side of them; for some of the Scythians make their way to them, from whom it is easy to get knowledge, and from some of the Greeks, too, from the Borysthenes port and the other ports of Pontus; such Scythians as visit them transact their business with seven interpreters and in seven languages.
- greek: μέχρι μὲν νυν τῶν φαλακρῶν τούτων πολλὴ περιφανείη τῆς χώρας ἐστὶ καὶ τῶν ἐμπροσθε ἐθνέων· καὶ γὰρ Σκυθέων τινὲς ἀπικνέονται εἰς αὐτούς, τῶν οὐ χαλεπὸν ἐστὶ πυνθέσθαι καὶ Ἑλλήνων τῶν ἐκ Βορυσθενοῦς τε ἐμπορίου καὶ τῶν ἄλλων Ποντικῶν ἐμπορίων· Σκυθέων δὲ οἱ ἂν ἔλθωσι εἰς αὐτούς, δι' ἑπτὰ ἑρμηνέων καὶ δι' ἑπτὰ γλωσσέων διαπρήσσονται.

Directions: [To here](#) - [From here](#)

© 2010 Transnavicom, Ltd
© 2010 Europa Technologies
© 2010 Tele Atlas
© 2010 Basarsoft

©2009 Google

43°00'30.44" N 34°00'59.94" E elev -2206 m

Eye alt 729.69 km

Resources | The NarrativeMap



Herodotus Timemap - Mozilla Firefox

Herodotus Timemap

Go to book: 1 2 3 4 5 6 7 8 9

Jump to: 4.38 E.g. "2.89"

Show: ☒ Settlements ☒ Regions ☒ Physical features

Map Satellite Terrain

Imagery ©2010 TerraMetrics Terms of Use

Araxes river Asia Arabian Gulf Cape Soloeis Caspian Sea Egypt India Red Sea Nile river Pillars of Heracles Samos island Indus river Caspatyrus Crete Europe Libya Lycia Phoenicia Sardis Tanais river Pontus Cimmerian Bosphorus Tyrae

Book 4, Ch. 38

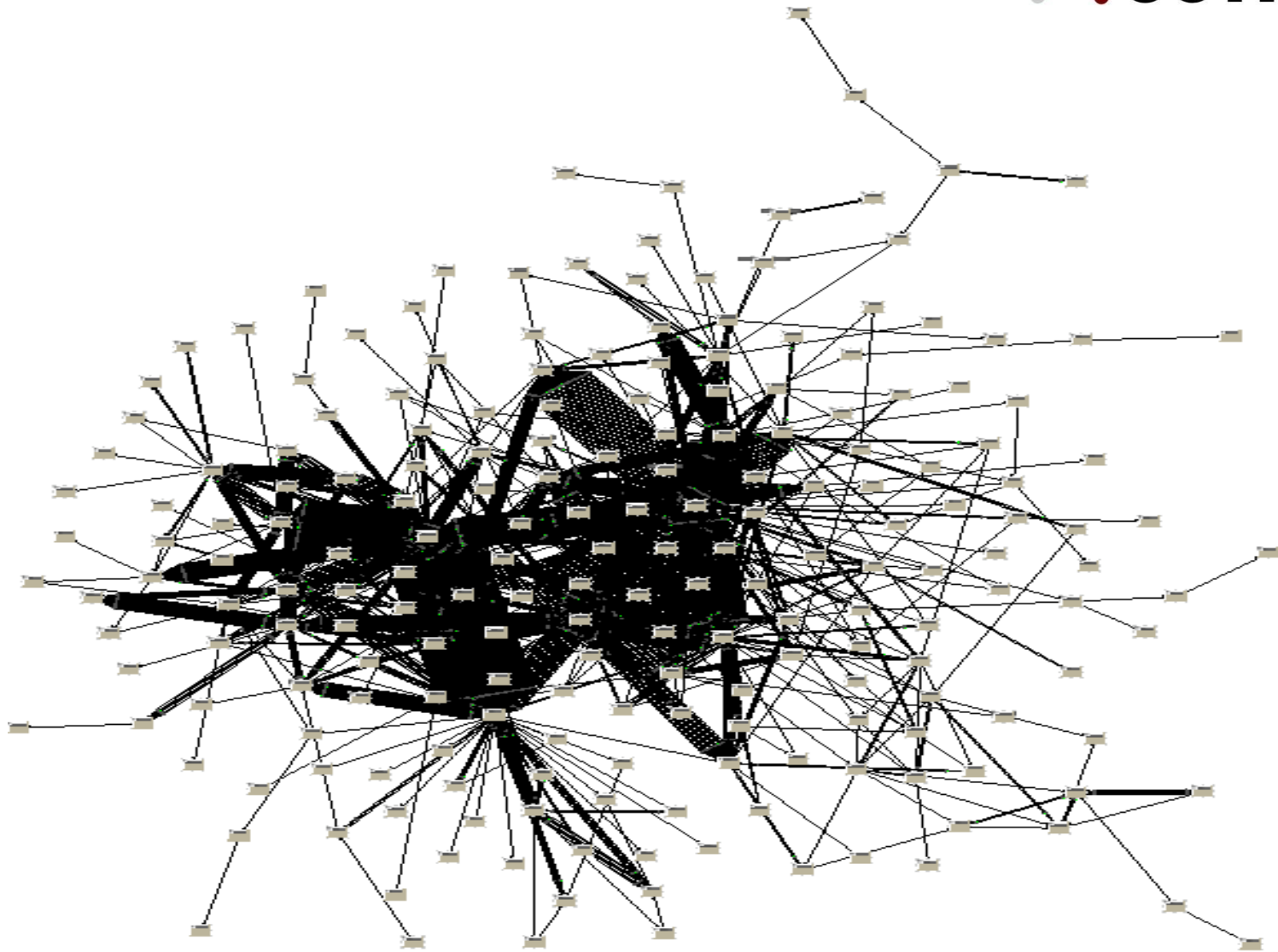
But west of this region two peninsulas stretch out from it into the sea, which I will now describe. On the north side one of the peninsulas begins at the Phasis and stretches seaward along the **Pontus** and the Hellespont, as far as Sigeum in the Troad; on the south side, the same peninsula has a seacoast beginning at the Myriandric gulf that is near Phoenicia, and stretching seaward as far as the Triopian headland. On this peninsula live thirty nations.

Switch to Greek << previous next >>

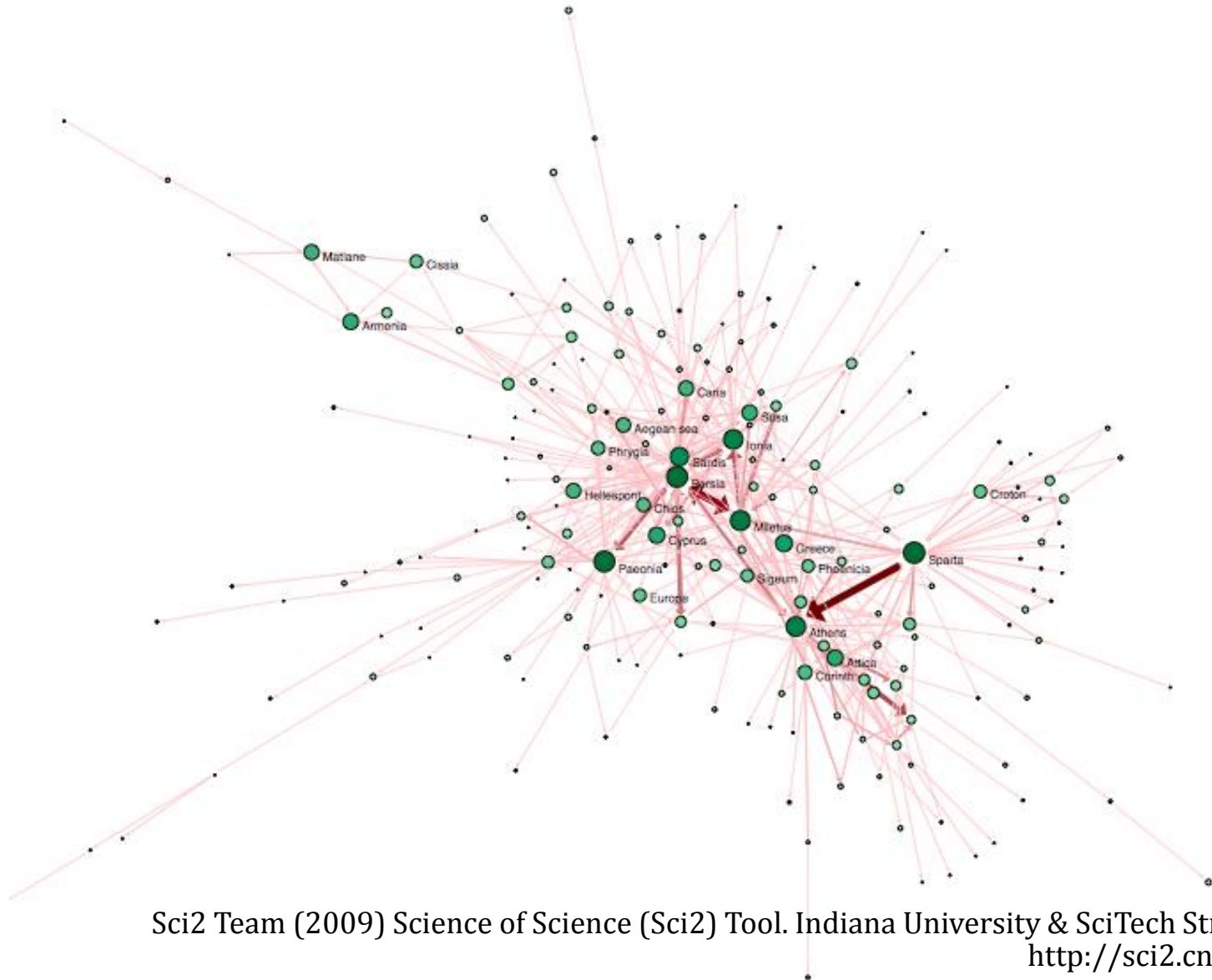
$$A=f_{ix}(B)$$

- Definition: place *and* proxy
- Unit: clause analysis (SVO) of *Histories* 5
- Quality: movement and/or transformation
 - Positioning
 - Movement
 - Static Intervention
 - Mobile Intervention
- Variables: focalisation, tense/mood, triads

Network Analysis | The Spaghetti monster

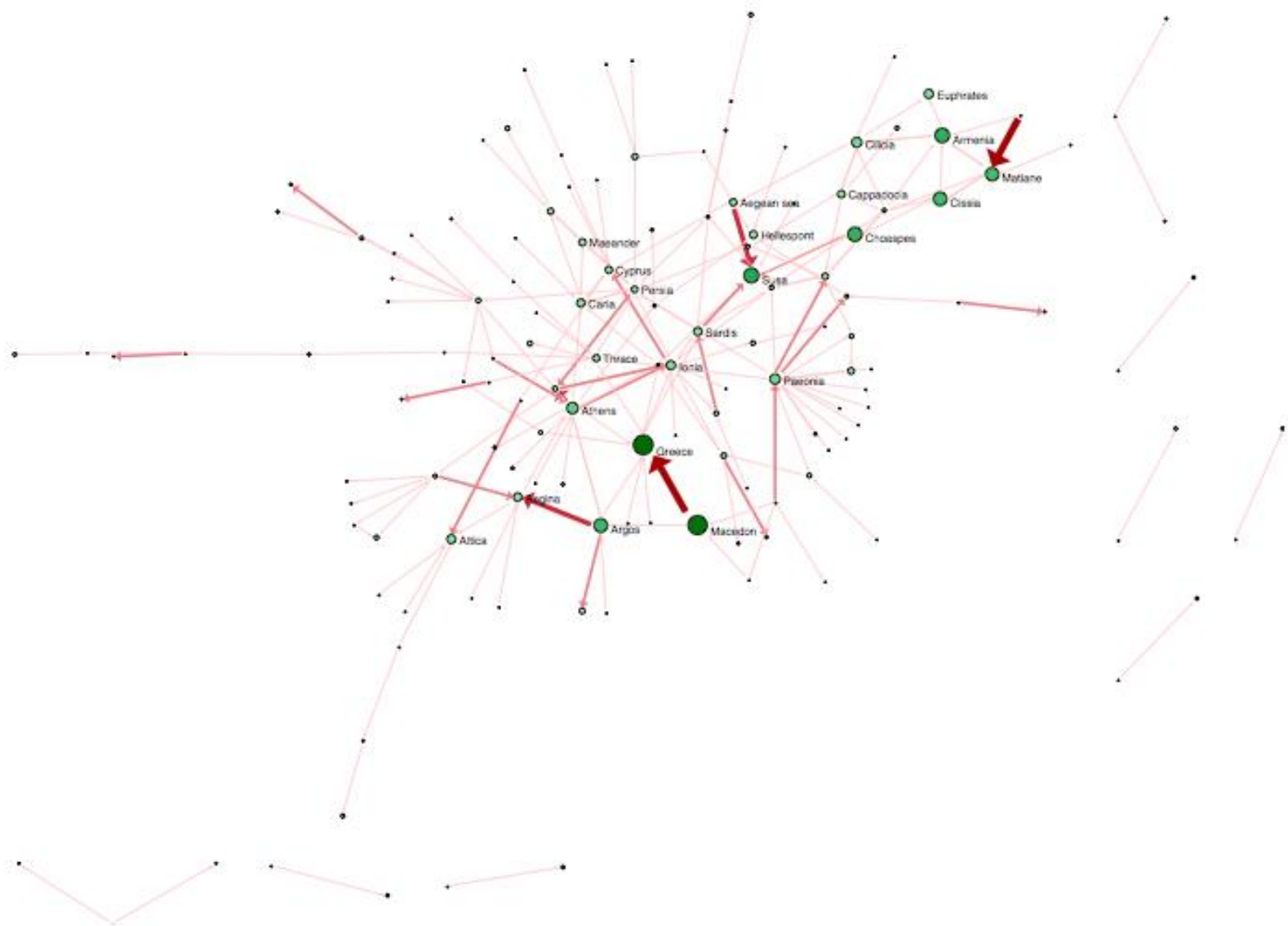


Network Analysis | Total book 5

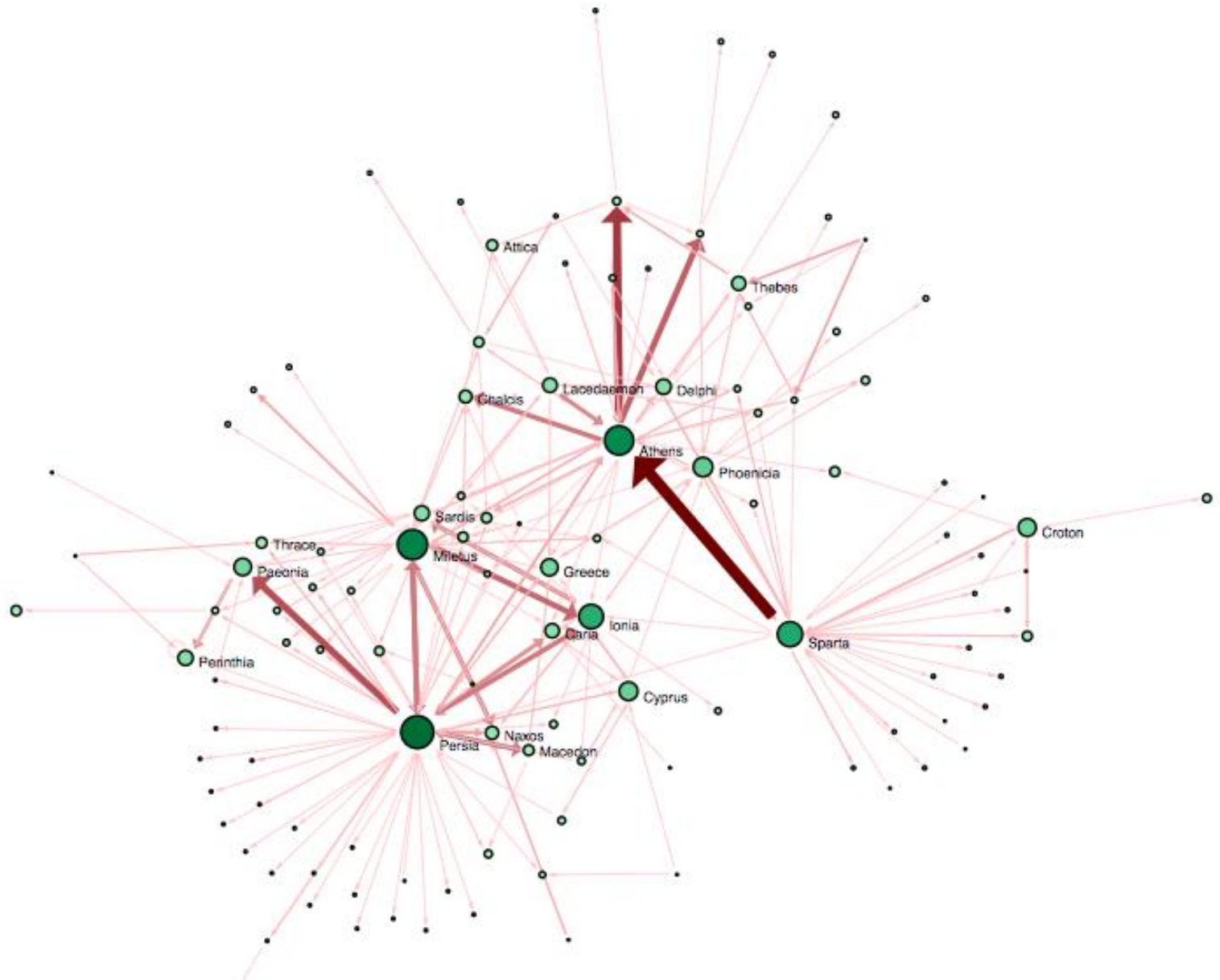


Sci2 Team (2009) Science of Science (Sci2) Tool. Indiana University & SciTech Strategies
<http://sci2.cns.iu.edu>

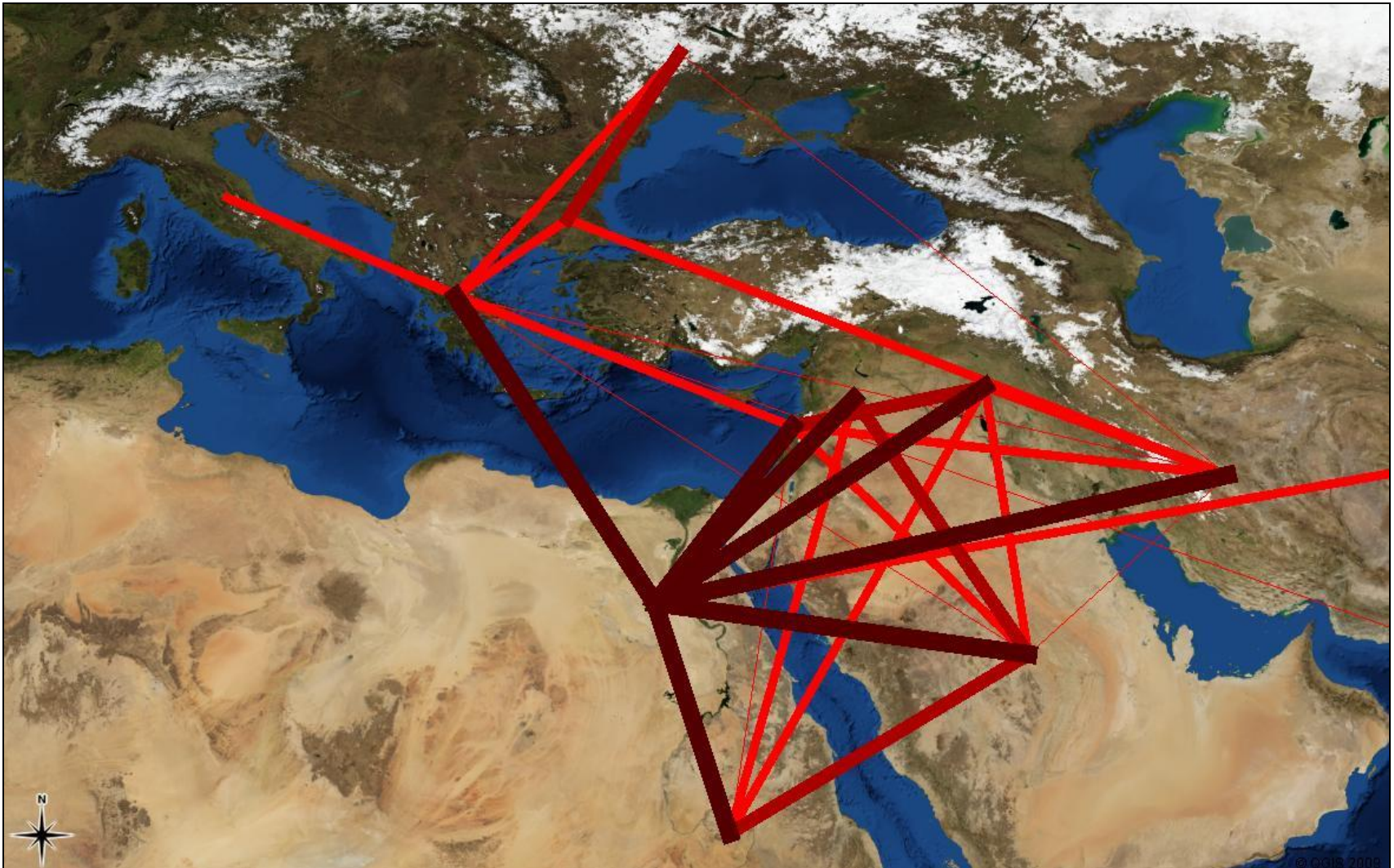
Network Analysis | Cat 1: Positioning



Network Analysis | Cat 4: Mobile Intervention



Strategy I + II | Automated networks



Aims:

- ☐ To foster knowledge exchange about the spatial analysis of textual data through a series of seminars;
- ☐ To enhance the experience of reading Herodotus spatially through the development of an online platform linked to other materials;
- ☐ To generate public interest and engagement through keeping a blog and offering free learning materials.

Funding:

- ☐ AHRC follow-on funding (Hestia: September 2008 – June 2010);
- ☐ Hestia2: 1 July 2013 – 30 June 2014

Work-packages:

- ☐ Import the Hestia data into GapVis to enable users to get a snapshot of places in Herodotus's *Histories*, move through the text, and gain a sense of each place's most important connections;
- ☐ Align the Hestia places to the Pelagios index of place references to enable users to link to and bring together different kinds of online data associated with those places;
- ☐ Conduct user testing and create Open Learn resources.

The Team:

- ☐ Kate Byrne (The Edinburgh Geoparser, University of Edinburgh);
- ☐ Eric Kansa (Open Context, UC at Berkeley)
- ☐ Adam Rabinowitz (GeoDia, University of Texas at Austin)
- ☐ Derek Matravers (Open Learn, The Open University)

GapVis | A Snapshot of the *Histories*



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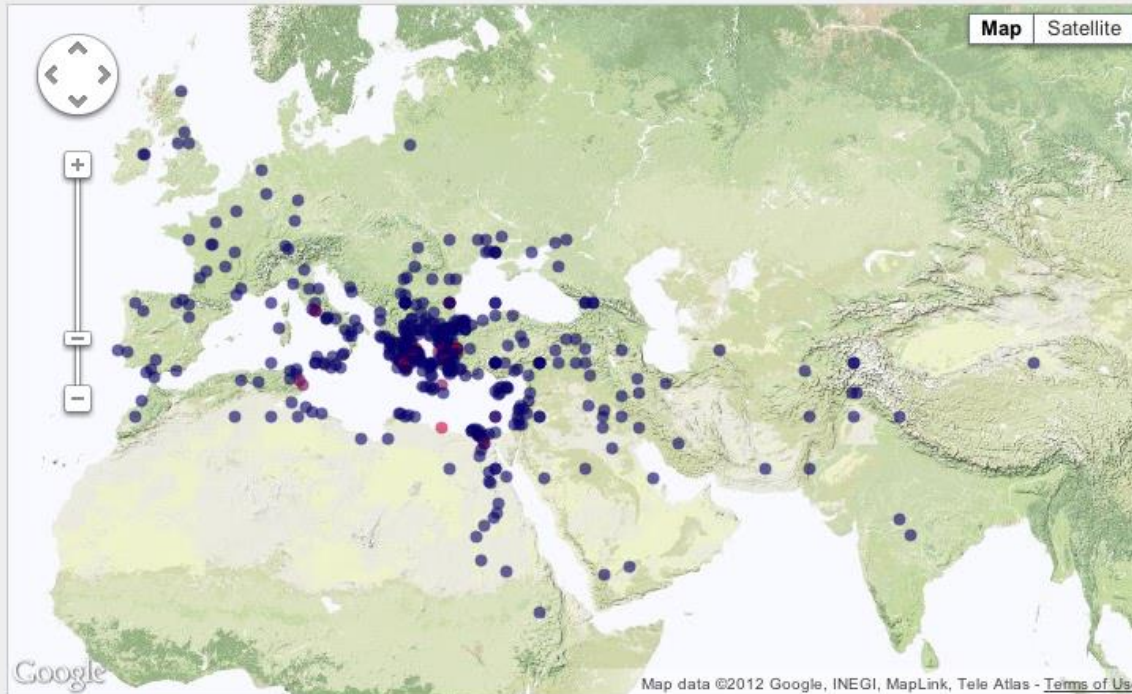
Herodotus

By Herodotus (translated by W. Beloe)

Published 1830 · [View on Google Books](#)

The Google Books version of "Herodotus", by Herodotus (translated by W. Beloe), was published in 1830. It references 486 identified ancient places. The place most frequently referenced is **Hellas**, followed by **Sardis/Hyde?**, **Athenae**, and **Dirphys M.**

[Go to Reading View](#) ▶



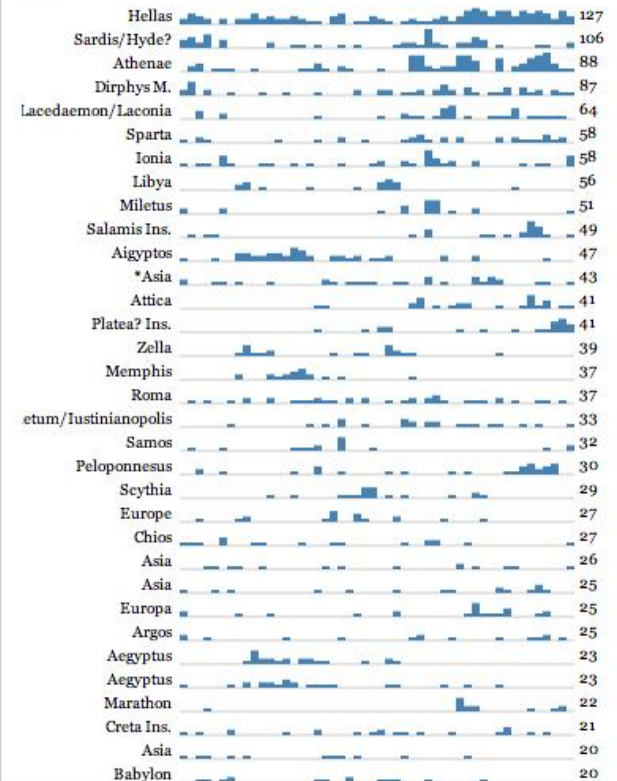
★ [Book Summary](#)

[Reading View](#)

[Place Detail](#)



Most-Referenced Places



GapVis | The Reading View



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Herodotus

By Herodotus (translated by W. Beloe)

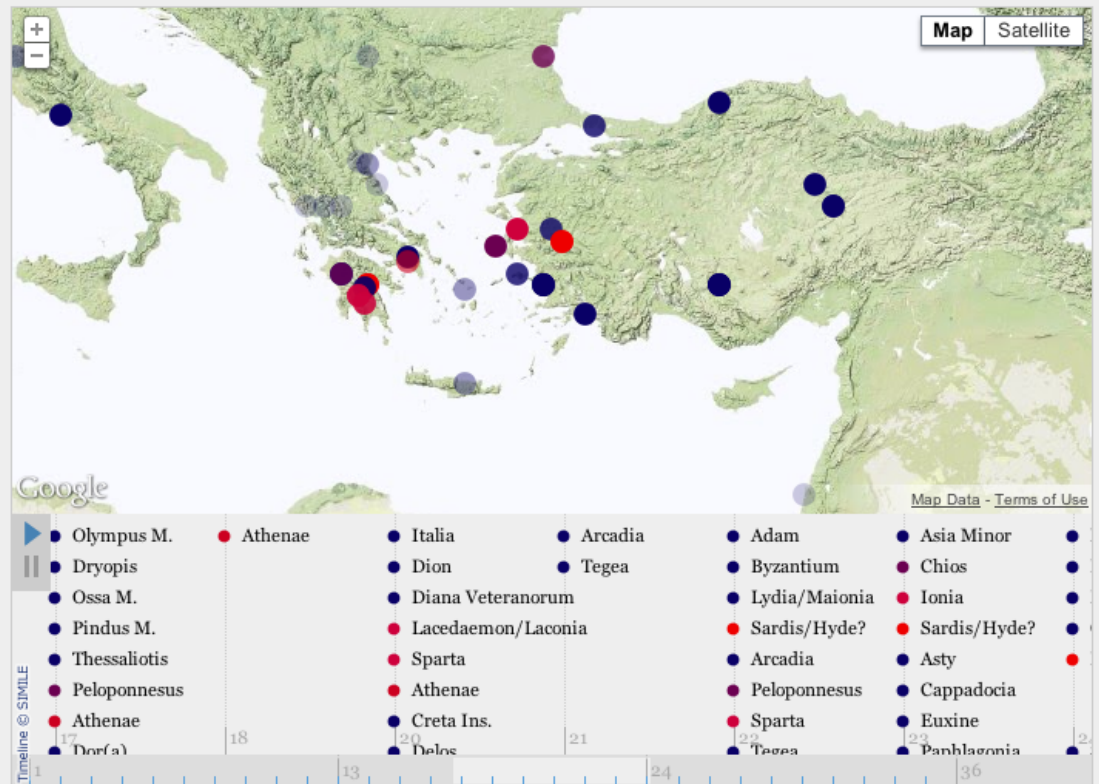
Published 1830 · [View on Google Books](#)

CLIO. 15 Amphiaraus, Trophonius, and the Milesian Branchidae. The above-mentioned are the oracles which Croesus consulted in **Greece**: he sent also to the Lybian Ammon. His motive in these consultations, was to form an idea of the truth of the oracles respectively, meaning afterwards to obtain from them a decisive opinion concerning the propriety of an expedition against the Persians. XL VII. He took this method of proving the truth of their different communications. He computed with his Lydian messengers, that each should consult the different oracles on the hundredth day of their departure from **Sardis**, and respectively ask what Croesus the son of Alyattes was doing: they were to write down, and communicate to Croesus, the reply of each particular oracle.* Of the oracular answers in general we have no account remaining; but the Lydians had no sooner entered the temple of **Delphi**, and proposed their questions, than the Pythian* answered thus, in heroic verse: I count the sand, I measure out the sea; The silent and the dumb are heard by me: E'en now the odours to my sense that rise, A tortoise boiling with a lamb supplies, Where brass below and brass above it lies. XL VIII. They wrote down the communication of the Pythian, and returned to **Sardis**. Of the answers which his other messengers brought with them on their return, Croesus found none which were satisfactory. But

Show: Text | Scan

<< previous 15 next >>

★ Book Summary Reading View Place Detail



Least referenced Most referenced

GapVis | The Place View



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Herodotus

By Herodotus (translated by W. Beloe)

Published 1830 · [View on Google Books](#)

★ Book Summary

■ Reading View

📍 Place Detail



Athenae



88 references

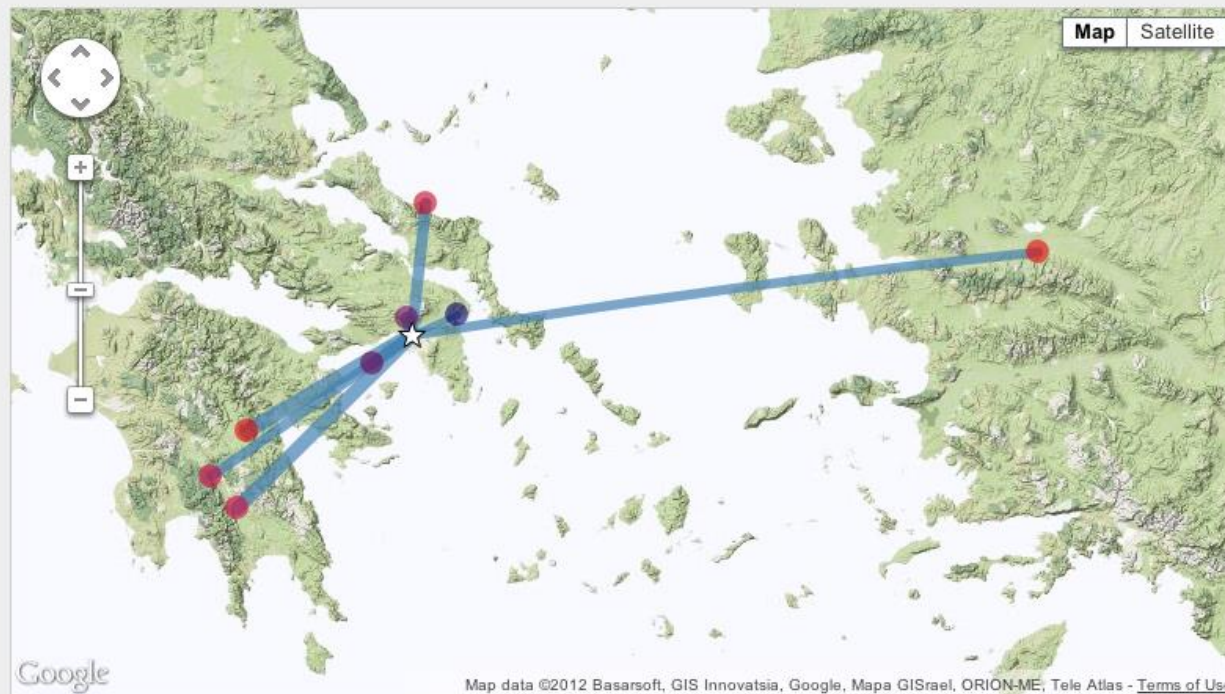
[Report a problem with this record](#)

External Resources

- [Place page on Pleiades](#)
- [Books referencing Athenae](#)
- [Pelagios Graph Explorer](#)

Top Related Places

Hellas (39)
Sparta (35)
Attica (32)
Salamis Ins. (29)
Dirphys M. (28)
Lacedaemon/Laconia (25)
Sardis/Hyde? (23)
Marathon (16)



Photos from Flickr · [View on Flickr >>](#)



Work-package of 4 seminars based on the analysis and visualisation of spatial relations embedded in texts:

- ☐ Southampton > network analysis models used for data exploration, esp. of archaeological reports;
- ☐ Stanford > problems of 'real content' by humanistic approaches to 'messy data' associated with literary texts;
- ☐ Birmingham > the role of GIS in mapping texts and informing policy debates on place and belonging;
- ☐ The OU > the extent to which digital technologies help non-academics access and comprehend research.

The Team:

- ☐ Tom Brughmans (ACRG, University of Southampton)
- ☐ Nicole Coleman (Center for Spatial and Textual Analysis, Stanford)
- ☐ Phil Jones (Department of Geography, University of Birmingham)
- ☐ Tony Hirst (Institute of Educational Technology, The Open University)

Today's Seminar | Some Initial Questions



- ❑ Rethinking the heuristics of space: developing innovative ways to conceptualise and represent topography/topology
- ❑ Cartographic representations in geography: a separate revolution is underway!
- ❑ Qualitative network mapping: one of the key outcomes of Hestia, but open questions remain
- ❑ What are the implications of moving towards a more automated approach?
- ❑ How can the generalisations required by the process be made in a theoretically-informed and scientifically-inclusive manner?

Today's Seminar | Programme



- 12:00 Maximilian Schich (The University of Texas at Dallas), Topography and Topology: Towards common ground in archaeological research
- 12:25 Alex Godden (Hampshire County Council), Historic Environment Records: New ways of looking for the past
- 12:50 John Goodwin (Ordnance Survey), Ordnance Survey and Linked Data
- 13:15 Discussion, followed by a tea/coffee break

- 13:55 Terhi Nurmikko (Southampton), “To survey the land, he left his city” and other proverbs: Mapping ancient Mesopotamia from cuneiform inscriptions
- 14:20 Kate Byrne (University of Edinburgh), Geoparsing and spatial network analysis in the GAP projects
- 14:45 Giorgio Uboldi (Politecnico di Milano), Knot: an Interface for the Study of Social Networks in the Humanities
- 15:10 Discussion, followed by a tea/coffee break

- 16:00 Keith May (English Heritage), Exploring the Use of Semantic Technologies for Cross-Search of Archaeological Grey Literature and Data
- 16:25 Paul Cripps (University of South Wales), GeoSemantic Technologies for Archaeological Resources
- 16.40 Discussion and wrap up

Today's Seminar | Themes



- ❑ Past conceptions of space, and new technologies that help us understand them
- ❑ New technologies allow us to do what we did before more efficiently and faster
- ❑ New technologies allow us to address new questions and explore new aspects of old data

- ▣ How can linked data techniques be used in the commercial, administrative and academic sectors?
- ▣ How can it enhance collaboration and sharing of data across different sectors?
- ▣ What are the advantages and disadvantages of doing so?
- ▣ How are concepts of space represented in linked data techniques?
- ▣ How can linked data enhance the study of past conceptions of space?
- ▣ How can network-based techniques enhance the study of large and heterogeneous datasets?
- ▣ What are the advantages of a networks research perspective?
- ▣ How can spatial and non-spatial network techniques be used to explore past conceptions of space?