

## GISCO Question – “Geospatial Moniker”

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(posted at <http://www.innovativegis.com/basis/GISgadfly/GeospatialQuestion.pdf>)

Folks—can anyone tell me about the derivation of the term “**Geospatial Technology**.” How is it differentiated from *Geomatics* (Canada) and *Géomatique* (France)? ...simply semantics and/or language differences?

In some senses, the term Geospatial Technology seems redundant ...is there a non-spatial geotechnology that necessitates the two-part moniker geospatial? It seems that the “geo” (pertaining to the lands, processes, features, inhabitants, and related phenomena of the Earth) implies “spatial” considerations. Maybe there is concern that some sort of an abstract non-earth “data space” rendering, like the scatter-plots of remote sensing’s multivariate “feature space,” might get confused with geo-spatial technology.

Like Biotechnology and Nanotechnology, it seems “**Geotechnology**” would be a crisper (less confusing and off-putting) descriptor of the spatial triad (RS, GIS, GPS) and its allied technologies (e.g., robotics and spatially-aware implements, guidance systems, still/videography, in-situ and moving sensors, etc). What do you think?

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### Summary of Responses:

There were insightful although mixed thoughts in the 24 responses. One comment suggested that the U.S. Department of Labor is the codifier of the term *Geospatial Technology* but didn’t state how the term came to be or the individuals/organizations involved in its deliberation.

Some of the respondents were uncomfortable with the term as it “doesn’t work well when talking to those outside the industry,” but most respondents felt that the moniker is ingrained and here to stay. Much of the discussion suggested that the term *geo* emphasizes the technology’s earth connection and the *spatial* term is needed to specify that it involves the measurement and characterization of geographic space— “I like geospatial because it emphasizes the spatial part of geo.”

One discussion thread was concerned that the use of the term *technology* distracts from the substantial science involved in the development and application of the discipline.

A few respondents felt that the alternate term *Geotechnology* is “both simple and concrete” but most felt that the term is not viable as it is 1) already an established Geology term “relating to geotechnical and geoenvironmental engineering” and 2) “too broad and covers much that isn’t mapping locations.”

P.S-- my early thoughts on the term *Geospatial Technology* are discussed in a 2009 Beyond Mapping column entitled “*What’s in a Name*” in the online [Beyond Mapping Compilation Series](http://www.innovativegis.com/basis/BeyondMappingSeries/BeyondMapping_IV/), Introduction to Book IV, Further Reading, Section 2 posted at [http://www.innovativegis.com/basis/BeyondMappingSeries/BeyondMapping\\_IV/](http://www.innovativegis.com/basis/BeyondMappingSeries/BeyondMapping_IV/).

**Listing of Responses** (*chronological first to last*):

- 1) So glad someone of authority brought this up... the term 'geospatial' has been a thorn in my side since I first heard it... Looking forward to the Sum! (Matthew Baker , [MATTHEW\\_BAKER@dpsk12.org](mailto:MATTHEW_BAKER@dpsk12.org))
- 2) I'm afraid that "Geotechnology" is already defined as relating to "earth sciences" (i.e. geology). If you Google it you will see definitions like this: **Full Definition of GEOTECHNOLOGY**— "the application of scientific methods and engineering techniques to the exploitation and utilization of natural resources (as mineral resources). I think that the spatial term is needed to distinguish between geographic applications versus geologic, which often get confused. That's my thought anyway. (Damon Judd, [Damon.Judd@denverwater.org](mailto:Damon.Judd@denverwater.org))
- 3) Interesting question, thank you! I took an "Environmental Geotechnology" course in my undergraduate degree that was essentially a geologic-engineering course. We learned about the structure of soil -- what is suitable to build on and what is not -- and the effect of slope on development. It was a great class and we even found bones from a 12,000 year old seal (now in the NY Natural History Museum) when we were taking core samples of a slope on Lake Champlain in New York! Anyway, just thought I'd put out there that geotechnology might imply a more geologic-engineering practice than studying the spatial patterns as we do in geospatial sciences. (Greg Colucci, [gcolu001@gmail.com](mailto:gcolu001@gmail.com))
- 4) While I think I understand what you mean here, I respectfully disagree for two reasons... 1) *Geotechnology* is already defined as "the application of scientific methods and engineering techniques to the exploitation and utilization of natural resources (as mineral resources)" (Mirriam-Webster, 2014), as well as "the application of science and technology in order to utilize the earth's natural resources" (Collins, 2014). Geospatial Technologies forge well past the realm of exploitation and utilization. I'D go as far as to state that Geotechnology is one aspect of the much larger field of Geospatial Technologies. 2) While there may not be a "non-spatial geotechnology," there are certainly non-technical aspects of "geospatial." (Dennis Ward, [dward@neoninc.org](mailto:dward@neoninc.org))
- 5) I like both geotechnology and geospatial technologies as terms. I find them both more useful and better understood than geomatics. I don't think there is any non spatial geotechnology. The terms can help... and the terms can add confusion. I have always thought that geospatial was a bit redundant but I think it is important because "spatial" is larger than geospatial – spatial includes all of the work done by the cognitive psychologists on different scales than is typical for us in the geospatial. (Joseph J. Kerski, [jkerski@esri.com](mailto:jkerski@esri.com))
- 6) That is something I haven't put a lot of thoughts into, but you bring up a great point. If you "wiki" the term, it has Geospatial Technology as another term for Geomatics. Based on quick searches, it seems as though Geospatial technology is the equipment used and Geotechnology is the methodology. Of course these are internet searches! Geospatial Technology: <http://www.usnews.com/science/articles/2011/05/11/geospatial-technology-as-a-core-tool>; Geotechnology: [Geotechnology - Definition and More from the Free Merriam-Webster Dictionary](#). (Jennie Koenig, [j\\_hursey@yahoo.com](mailto:j_hursey@yahoo.com))
- 7) I don't know how that term popped up, but I have a sense that it started getting big when not geographic types started getting into geographic info and technologies. All of a sudden, people were using the word and it seems the geographic community just gave into it. I do know that Mike Goodchild used to call the term an abomination, along with people saying "GIS systems". (Jon Gottsegen, [jon.gottsegen@state.co.us](mailto:jon.gottsegen@state.co.us))
- 8) I graduated from a program in "Geodetic Sciences" in the 1970s in Canada, which was formed in the 1960s. This predated GIS, and "geomatics" meant everything from Tellurometers to "mensuration" (survey calcs with calculators or computers). In the early 1960s, in Chile, someone floated the term "geometrology" as a joke. My guess is that no one knows the exact origin and meaning of these terms. I grade them as attempts to either show affiliation with or differentiation from other groups. The most prevalent term (Canada, Europe, Russia, China, Australia, etc.) is Geomatics (for the activity). "Geospatial Technology" is used mostly by investor groups to identify opportunities. (Harold Schuch, [hschuch@geocounsel.com](mailto:hschuch@geocounsel.com))

- 9) I have to agree. Geotechnology is both simple and concrete. Today we combine geo based technologies to provide solutions. For example, by default, all mobile GIS applications use GPS. Increasingly we include sensors, geo-references images etc. Geo unites the technologies we leverage. I think one of our big challenges is to stop using terms like GIS, geospatial, GPS. As we move from being a niche sector, into the core of organizational systems our language, messaging and reference points need to change. Geotechnology works on many different levels. (Matt Sheehan, [matt@webmapsolutions.com](mailto:matt@webmapsolutions.com))
- 10) Maybe it would rather be that instead of geospatial technology, the term could be hyphenated, such as geo/spatial technology. This is because all spatial technology is not geographic per say, such as the interior of a store, or mapping the surface of a cell, where spatial technology is employed in a non-geographic way. Or, there should be 2 words....geotechnology and spatialtechnology, to delineate both disciplines. Food for thought. (Frederick Couch, [vectorq@gmail.com](mailto:vectorq@gmail.com))
- 11) For its first 25 years or so Geographic Information Systems (GIS) was in the software construction business. It was building homes for applications, tools for businesses, and markets for services. When GIS grew up it became Geospatial Science ready to take on the world with all its new understanding, applications and world wide data resources. Geospatial science has far superseded its adolescence and is now headlong into maturity competing in the information business. Similar to the evolution of the science it teaches, geospatial learning finds itself in an expansive market. Connecting student skills with market demand is the grist of the education geospatial mill and tantamount to graduate success. Just before ESRI entered the GIS software business in 1982, the character Yoda in Star Wars: Episode V - The Empire Strikes Back (1980) offered an admonition about learning. "Ready are you? What know you of ready? My own counsel will I keep on who is to be trained. A Jedi must have the deepest commitment, the most serious mind. This one a long time have I watched? All his life has he looked away... to the future, to the horizon. Never his mind on where he was. You must unlearn what you have learned. " .... There's no classroom for ready. *Geospatial science. Geospatial analytics. Geospatial indicators. Geospatial events. Geospatial behavior. Geospatial behavior ... Let's see. Geospatial behavior of disaster. Geospatial behavior of disease. Geospatial behavior of weather. Geospatial behavior of economies. Geospatial behavior of agriculture. Geospatial behavior of water. Geospatial behavior of energy resources. Geospatial behavior of environment. Geospatial behavior of human development.* This is it. This is the real deal. This is science, technology, engineering, and mathematics all in one wrapper. An important reference describing the geospatial science is titled "*Teaching Geographic Information Science and Technology in Higher Education*". (Editors David Unwin, Nicholas Tate, Kenneth Foote and David DiBiase, 2012). Among the contributing authors, Richard Schultz of Elmhurst College sets the geospatial science table saying, "*Few can have a complete appreciation for the development of their disciplines without fully understanding why the discipline developed as it did. The implication for geospatial academia and the commercial GIS and T (Geographic Information Science and Technology) community is that we, as a society, have currently attained a point where the objectives of the two pursuits have become divergent, thus defining the necessary distinction between the traditional study of geography as a human and cultural discipline and the scientific study of geospatial information technology as a true science.*" (David Skiles, [dvskiles@icloud.com](mailto:dvskiles@icloud.com))
- 12) You may want to know: <http://geotechnology.com/> exists in the US as a registered company name. (Harold Schuch, [hschuch@geocounsel.com](mailto:hschuch@geocounsel.com))
- 13) The term geospatial came about when attempting to quantify the various disciplines of land surveying, GIS, GPS, photogrammetry, aerial sensors, remote sensing, satellite imagery and related 'geo' technologies and sciences. Prior to this 'GIS' was used to describe everything and it did not make much sense since GIS is an important, but only one aspect of spatial technology. As a result of the term 'geospatial' the Department of Labor anointed us as a unique industry: [http://www.doleta.gov/brq/indprof/geospatial\\_profile.cfm](http://www.doleta.gov/brq/indprof/geospatial_profile.cfm). Being the receiver of many job descriptions and resumes I see the term used and misused in a variety of ways. The most important to come of this, other than being recognized as a unique high-growth industry is the Geospatial Competency Model:

<http://www.doi.gov/opa/media/press/eta/eta20100950.htm>. The discussion should continue. (Richard Serby, [rich@geosearch.com](mailto:rich@geosearch.com))

- 14) Seems to me geo is too broad and covers much that isn't mapping locations, which is probably why spatial was added. If simplicity is the goal than perhaps just use Geomatics instead of creating yet another moniker. But who would push our industry to adopt a French Canadian term. It would be too crazy, like adopting the metric system. (Mike Pelletier, [MPelletier@gunnisoncounty.org](mailto:MPelletier@gunnisoncounty.org))
- 15) Does **Geotechnology** sell the scientific component of these allied tools and disciplines? What about GeoSTEM? Much buzz and momentum around STEM. Why not join that? (Paul Tessar, [paul.tessar@gmail.com](mailto:paul.tessar@gmail.com) responding to Matt #9)
- 16) One reason to keep "geospatial technologies" as distinct from "geotechnologies" is that the latter term is used in engineering to mean something rather different—a field relating to 'geotechnical and geoenvironmental engineering'. For examples, see MIT site (<https://cee.mit.edu/graduate/MEng/Geotech>) or this engineering consulting firm (<http://geotechnology.com/>). "Spatial technologies" is not quite it either because, as Frederick mentions, things can be "spatial" without actually referencing Earth or any specific location per se. (Sophia Linn, [Sophia.Linn@colostate.edu](mailto:Sophia.Linn@colostate.edu))
- 17) Coming from an earth science and engineering background, geotechnology is already a word used widely in the literature. Its use is related to science and engineering. *Geotechnology: the application of scientific methods and engineering techniques to the exploitation and utilization of natural resources (as mineral resources)*. (Kenneth Rukstales, [rukstales@usgs.gov](mailto:rukstales@usgs.gov))
- 18) As a former geologist, I should point out that "geotechnology" could be understood to cover non-spatial technologies in the "other" geo: drilling technology, seismic interpretation techniques, seismic processing algorithms, geologic modeling software, geologic data management, geotechnical engineering techniques, etc, etc ad infinitum. These have partial or zero spatial components. I like "geospatial" since it emphasizes the spatial part of geo. (Warren Roe, [wroe@vt.edu](mailto:wroe@vt.edu))
- 19) As another former geologist, I second Warren's position that "geospatial" emphasizes the spatial part of geo for the same reason that "geotechnology" could emphasize the other geo: geology like geomorphology, geochronology, and such. (Steve Haymes, [srhaymes@comcast.net](mailto:srhaymes@comcast.net) responding to Warren #18)
- 20) I would not use geotechnology for defining GIS/remote sensing/GPS technology. For me geotechnology is very vague, are you talking about technology related to geography or geology? Older references to geotechnology reference geology, but I have noticed that the geography based definition is starting to dominate... for good or bad our language is alive and changing. For me geotechnology references geology and thus defines the study of subsurface conditions and materials through soil and rock mechanics (shear, hydraulic conductivity, capillary moisture, etc.). One definition I found also has a nice list of examples: "Examples of geotechnology are underground coal gasification, bacterial lixiviation, sulfur liquefaction, sublimation of substances, the extraction of mineral products from thermal waters and volcanic deposits, and the thermal extraction of petroleum and its distillation products." (Karin Eichhoff, [karin.eichhoff@state.co.us](mailto:karin.eichhoff@state.co.us) responding to Sophia #16)
- 21) Thanks for the good points on geotechnology/geotechnical. I've been using the terms GIS and 'geospatial technology' for many years now, though embracing the latter more and more as it seems to be gaining traction. I'm sure some of you have also heard our industry casually referred to as the 'GPS field' (no offense toward those working directly with GPS technology)!! (John E. Polasky, [jjpolasky@gmail.com](mailto:jjpolasky@gmail.com) responding to Steve #19)
- 22) It's unfortunate that our industry suffers this fate of not knowing what to call itself. It reminds me of the 'what is geography and how is it different from other disciplines' discussions back when I was working on my MA. I get why many of us like to use 'geospatial' but it just doesn't work well when talking to those outside the industry. In fact I find that all the names and acronyms we use amongst industry-insiders really don't work well at all for outsiders. All seem to leave puzzled looks and beg

the need for more explanation. For that reason, I generally settle for 'mapping' when describing my work to outsiders. (Michele Mattix, [michele@geomattix.com](mailto:michele@geomattix.com) responding to John #21)

23) Perhaps we should consider the German approach, by including the temporal and attribute facets of our field: GeoSpatioTemporoStatisticoData Technology. Certainly this is the challenge - so many applications prevent a specific and simplified industry name. I would concur that Geo and Spatial are not redundant if taken to mean "earth" and "measurement" - especially as it would seem Geotechnology is a clear fit with the mining and drilling "geo". It does remain a good question, however, that if "Geospatial" became an official industry profile in 2004 and with all of the technology applications that have become commonplace. Why is Geospatial still not half as renowned as "mapping"? (Margaret-Rose Spyker, [mrmspyker@gmail.com](mailto:mrmspyker@gmail.com) responding to Michele #22)

24) I agree Michele. We find the same challenge. I've always disliked using the term geospatial. It's a part of our vernacular. Nobody else's. Mapping might be a more widely understood term but it so poorly describes what we do. (Matt Sheehan, [matt@webmapsolutions.com](mailto:matt@webmapsolutions.com) responding to Michele #22)