NEGLIGENCE AND GEOSPATIAL DATA: A FAIR DISTRIBUTION OF LIABILITY

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I. INTRODUCTION

In 2011, a natural gas pipeline exploded in San Bruno, California killing four people and destroying over thirty-five homes.[1] The cause of the disaster was traced back to inaccurate geospatial data.[2] Because the geospatial data did not accurately depict what pipelines were under the surface or the history of problems with those particular pipes, the pipeline company was unaware of the imminent dangers.[3] Incorrect geospatial data can have consequences on even everyday users of such data. In 2017, a woman drove her car into a river after her global positioning system (GPS) directed her down an em-

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1. Eric Nalder, *PG&E's Computer System Faulted for Pipeline Errors*, SFGATE (Feb. 13, 2011, 4:00 AM), https://www.sfgate.com/news/article/PG-E-s-computer-system-faulted-for-pipeline-errors-2459766.php.

2. *Id.* "[O]nly 70 percent of the data in the GIS database are accurate and that overall, it is 'a really dangerously bad project.' " *Id.*

3. *Id.*

bankment and into a river.[4] Although she was unharmed, her new car sank to the bottom of the river.[5]

Geospatial data is data that references information to a location on the Earth.[6] A basic example of geospatial data is a zip code. It is a piece of information that indicates a location on the Earth. All levels of government and individual private actors produce, use, and disseminate geospatial data. For example, local governments collect and disseminate local geospatial data to the public.[7] Users can then take this information and create maps about the various attributes of municipalities.[8] Geospatial data can also be used in far more complex ways, such as in aeronautical maps, GPS devices, land use planning, disaster management, and utilities, among others.[9] When this data is incorrect, though, it can have devastating consequences.

Geospatial data can be collected in several ways. The information contained in old, physical maps may be digitized, collected, and recorded in person using digital-coordinate devices, or they may be imaged from satellites orbiting the Earth that take pictures of the Earth and collect data about the surface through various sensors.[10]

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4. *Woman Blames GPS After Driving into River*, CBS MIAMI (Nov. 6, 2017, 12:55 PM), https://miami.cbslocal.com/2017/11/06/gps-directions-woman-river/ [https://perma.cc/R5L4-WEVZ].

5. *Id.*

6. Caitlin Dempsey, *What Is the Difference Between GIS and Geospatial?*, GIS LOUNGE (Jan. 14, 2014), https://www.gislounge.com/difference-gis-geospatial/ [https://perma.cc/N4PJ-KMCR]; *What Is GIS?*, ESRI, https://www.esri.com/en-us/what-is-gis/overview [https://perma.cc/E6P8-ZN9M].

7. *See* Nancy von Meyer, David Salzer, and Patrick Santoso, *Making Local Parcel Data Open at State, National Levels*, ESRI (2016), https://www.esri.com/esri-news/arcnews/winter16articles/making-local-parcel-data-open-at-state-national-levels [https://perma.cc/G39P-S26D]; *see, e.g.*, *NYCCityMap*, NYC.GOV, http://maps.nyc.gov/doitt/nycitymap/ [https://perma.cc/FP3J-6M5R]; *Tallahassee-Leon County Geographic Information Systems*, TALLAHASSEE-LEON COUNTY GIS, http://www.tlcgis.org/ [https://perma.cc/9VUC-8EZV].

8. User can create maps about municipalities by using a geographic information system to gather the data and create a map from it. Dempsey, *supra* note 6; Justine Nofal, *Basic Uses of GIS*, GISLOUNGE (Aug. 6, 2012), https://www.gislounge.com/basic-uses-of-gis/ [https://perma.cc/2PSA-JDKU]. "[Geographic information system] refers to a system where geographic information is stored in layers and integrated with geographic software programs so that spatial information can be created, stored, manipulated, analyzed, and visualized (mapped)." Dempsey, *supra* note 6.

9. *1000 GIS Applications & Uses – How GIS Is Changing the World*, GISGEOGRAPHY, https://gisgeography.com/gis-applications-uses/ (last updated Mar. 4, 2019).

10. Manuel S. Pascual, *Data Capture in GIS*, GIS LOUNGE (Oct. 8, 2012), https://www.gislounge.com/data-capture-in-gis/ [https://perma.cc/JQP5-TAU9]; Joshua Robinson & Kent D. Perkins, *Best Practices for Collecting Geographic Data in the Field*, FLA. MUSEUM NAT. HIST. (Aug. 27, 2008), https://www.floridamuseum.ufl.edu/herbarium/methods/Georeferencingbestpractices.htm [https://perma.cc/MXG9-HDN7]. Researchers may also use Light Detection and Ranging (LiDAR) to measure distances and angles or to collect data from interpreting pictures of the Earth through a process called photogrammetry. *Id.* LiDAR sends pulses of light vertically towards the ground from an airplane or helicopter. By waiting to see how long it takes for the pulse of light to return to the aircraft researchers can measure how far the surface is away from the airplane or helicopter. *See A*

This is not an exhaustive list, but it does reflect some of the most common ways of collecting geospatial data.

Although most geospatial data is exchanged between producers and users through contracts, this Note will not examine this aspect in any depth beyond a brief overview of this contractual relationship. Rather, this Note will analyze how a pure comparative negligence theory of liability benefits users and producers of geospatial data when no contractual relationship exists.

A pure comparative negligence theory of liability should be applied to geospatial data producers when their data is inaccurate and causes harm. This best allocates responsibility to both users and producers of geospatial data. Holding both of these actors accountable for their own negligence will prevent producers from withholding their geospatial data to avoid liability, and it will encourage users to become educated on how to best use geospatial data. There is little literature regarding the unique nature of geospatial data and liability, but there is some literature that discusses analogous types of information. When these authorities are applied to geospatial data producers, they suggest that these producers, either governmental or private, do face some kind of negligence liability, and that users of that data can be found liable as well.[11] Thus, this Note aims to draw out these ideas of information liability to apply them to geospatial data and determine a fair way to allocate responsibility between producers and users.

Part II of this Note will discuss how geospatial data cannot be satisfactorily defined as either a product or a service, but rather as some hybrid product-service for which strict liability is inadequate. Part III will briefly explain how geospatial data producers can be liable in contract law and in tort law, and it will show how courts have held both producers and users of geospatial data liable. Part IV will argue that states that do not currently adopt a pure comparative negligence theory of liability should apply such liability to geospatial data, because it is the fairest distribution of responsibility between users and producers in this context. Part V will address the potential issue of tort liability suppressing the sharing of geospatial data. It will argue that a pure comparative negligence theory of liability is the best way to encourage, or incentivize, the sharing of information while also holding producers accountable for inaccurate data that could poten-

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Complete Guide to LiDAR: Light Detection and Ranging, GISGEOGRAPHY, https://gisgeography.com/lidar-light-detection-and-ranging/ [https://perma.cc/3CTS-9Y58]. Photogrammetry uses photographs of the Earth's surface to measure and identify features of the Earth's surface. SBL, *A Brief Introduction to Photogrammetry and Remote Sensing*, GISLOUNGE (July 12, 2015), https://www.gislounge.com/a-brief-introduction-to-photogrammetry-and-remote-sensing/ [https://perma.cc/Z7XB-8V88].

11. *See infra* Part II.B.2.

tially cause harm. Part VI will conclude, contending that geospatial data producers should be liable under a pure comparative negligence theory.

II. DISTINGUISHING BETWEEN GEOSPATIAL DATA PRODUCTS AND SERVICES

Ultimately, many geospatial data producers lie in a grey area of creating both a product and providing a service. Whether something is categorized as a product or a service affects how liability attaches to it.[12] A product will most likely be subject to tort liability under a products liability doctrine,[13] while a service could be subject to contract law liability under breach of contract[14] or tort liability under a negligence framework.[15] Sometimes, something might be both a product and a service. When this happens, courts must decide how to assign liability.[16] The following discussion will examine how geospatial data seems to lie somewhere between a product and a service.

A. Products

Products are defined based on a tangible-intangible distinction.[17] The Restatement (Third) of Torts states that "[a] product is *tangible* personal property distributed commercially for use or consumption,"[18] whereas, intangible things are not products.[19] A map, chart, or other

12. *See* Charles E. Cantu, *The Illusive Meaning of The Term "Product" Under Section 402a of the Restatement (Second) of Torts*, 44 OKLA. L. REV. 635, 639 (1991).

13. *See* Joachim Zekoll, *Liability for Defective Products and Services*, 50 AM. J. COMP. L. 121, 134 (2002).

14. Although this Note will not discuss the implications of contract law liability to geospatial data producers, it is worth noting that even under a contract law scheme geospatial data does not clearly fit existing categories. Under the Uniform Commercial Code, geospatial data lies in a grey area with regards to whether it is a good. The Uniform Commercial Code defines "goods" to be all movable, tangible things. U.C.C. § 2-105(1) (AM. LAW INST. & UNIF. LAW COMM'N 2003); *id.* § 2A-103(1)(h); *see also id.* § 9-102(a)(42). Under this definition, geospatial data would not be considered a "good." Although it is movable, it is not tangible. Yet some courts have attempted to make distinctions "based on the degree of development or programming provided by the seller or licensor to meet the needs of the buyer or licensee." Gary D. Spivey, *Computer Software Sales and Licenses as Subject to Article 2 of Uniform Commercial Code*, *in* 26 A.L.R.7TH ART. 10, § 2, at 586 (2017). That means that "mass-produced" data is a "good" under the Uniform Commercial Code, even if it has been somewhat customized for a user. *Id.* By contrast, data that is specifically created and customized for a particular user is not a "good" under the Uniform Commercial Code. *Id.*

15. Zekoll, *supra* note 13, at 134.

16. *See* William C. Powers, Jr., *Distinguishing Between Products and Services in Strict Liability*, 62 N.C. L. REV. 415, 430-32 (1984).

17. This Note borrows this term from Reutiman, *infra* note 20. It adequately describes in three words how courts determine what qualifies as a product.

18. RESTATEMENT (THIRD) OF TORTS § 19 (AM. LAW INST. 1998) (emphasis added).

19. *See, e.g.*, Winter v. G.P. Putnam's Sons, 938 F.2d 1033, 1036 (9th Cir. 1991).

physical representation of geospatial data would be a product, as defined by the Restatement, based on that distinction. However, courts have failed to consistently apply the tangible-intangible distinction.[20] Where some courts rely on this distinction, others find different justifications, such as the ability to mass-produce the product.[21]

Courts have found aeronautical charts to be products because the physical maps are tangible manifestations of data.[22] The Ninth Circuit in *Aetna Casualty & Surety Co. v. Jeppesen & Co.* found that the physical graphical approach chart produced by Jeppesen was Jeppesen's product,[23] notwithstanding the fact that the information itself—the raw data—was not Jeppesen's product.[24] In so holding, the court did not provide a justification or reasoning for its conclusion.

Similarly, courts have found that books are not products. In a different Ninth Circuit case, the plaintiffs relied on a book called *The Encyclopedia of Mushrooms* to pick and consume wild mushrooms.[25] They became so severely ill that they needed liver transplants.[26] They sued the publisher on theories of products liability and negligence, claiming that the book contained erroneous information, and that the publisher had a duty to confirm the accuracy of the information contained in the book.[27] The court rejected the plaintiff's argument that the book was like an aeronautical chart, stating that

> [a]eronautical charts are highly technical tools. They are graphic depictions of technical, mechanical data. The best analogy to an aeronautical chart is a compass. Both may be used to guide an individual who is engaged in an activity requiring certain knowledge of natural features. Computer software that fails to yield the result for which it was designed may be another. In contrast, *The Encyclopedia of Mushrooms* is like a book on how to *use* a compass or an aeronautical chart. The chart itself is like a physical "product" while the "How to Use" book is pure thought and expression.[28]

Thus, the publisher had no duty to confirm the accuracy of the information contained within.

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20. *See* Joseph L. Reutiman, Note, *Defective Information: Should Information be a "Product" Subject to Products Liability Claims?*, 22 CORNELL J.L. & PUB. POL'Y 181, 187-88 (2012).

21. *See* Saloomey v. Jeppesen & Co., 707 F.2d 671, 677 (2d Cir. 1983).

22. *See* Aetna Cas. & Sur. Co. v. Jeppesen & Co., 642 F.2d 339, 341-42 (9th Cir. 1981); *see Saloomey*, 707 F.2d at 676.

23. *Aetna*, 642 F.2d at 341-42 (discussing Jeppesen's liability after an airplane followed an incorrect aeronautical chart, causing it to crash).

24. *See id.* at 342 (noting that the "graphic approach chart" was "Jeppesen's 'product.'").

25. Winter v. G.P. Putnam's Sons, 938 F.2d 1033, 1033 (9th Cir. 1991).

26. *Id.* at 1034.

27. *Id.*

28. *Id.* at 1036.

In *Saloomey v. Jeppesen & Co.*, the Second Circuit similarly held that Jeppesen's physical chart was its product, not the information itself, because "of the chart's mass production and the publisher's ability to purchase product liability insurance."[29] This same reasoning has been applied to GPS devices—they are mass produced and are physical manifestations of information.[30] Geospatial data can also be mass produced,[31] and it is possible for geospatial data producers to purchase liability insurance.[32]

B. Services

The Restatement (Third) of Torts defines a service as some action provided to another in exchange for payment. Products may be related to a service, but the consumer is paying for the actions done, not the physical things used to complete the actions.[33] Thus, geospatial data producers may provide a service. A user may obtain a database of geospatial information, but this information may require constant updating by geospatial data producers to ensure it does not become obsolete.[34] Users might pay geospatial data producers to keep this information current on a yearly, monthly, real-time, or another basis. Users and geospatial data producers often come to an agreement about what data requires updating, how often, from what source, and whether some kind of preliminary modifications are performed.[35]

Evaluating geospatial data producers as providing a service may be a tricky endeavor because certain processes related to the creation of the data product may be recognized as a service but is actually a product being sold. Services provided in order to sell data products,

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29. Robert B. Schultz, *Application of Strict Product Liability to Aeronautical Chart Publishers*, 64 J. AIR L. & COM. 431, 439 (1999) (citing Saloomey v. Jeppesen & Co., 707 F.2d 671, 676-77 (2d Cir. 1983)).

30. Martin J. Saulen, Note, *"The Machine Knows!": What Legal Implications Arise for GPS Device Manufacturers When Drivers Following Their GPS Device Instructions Cause an Accident?*, 44 NEW ENG. L. REV. 159, 186 (2009).

31. Most geospatial data is available in the public domain or can be purchased from private companies.

32. Earl F. Epstein, *Liability Insurance and the Use of Geographical Information*, 12 INT'L J. GEOGRAPHICAL INFO. SCI. 203, 212 (1998).

33. *See* RESTATEMENT (THIRD) OF TORTS: PRODS. LIAB. § 19 cmt. a, illus. f. (AM. LAW INST. 1998); *see id.* § 19(b) ("Services, even when provided commercially, are not products.").

34. *See* Hakan Maras & M. Orhan Altan, *Updating of a Geographic Database: An Application and Design of a Geographic Information System*, 33 INT'L ARCHIVES PHOTOGRAMMETRY AND REMOTE SENSING 616, 616-17 (2000).

35. *See* Mehdi Mashud Khan et al., *A Better Way to Handle GIS Data*, ESRI: ARCUSER (June 2007), http://www.esri.com/news/arcuser/0507/dhec.html [https://perma.cc/7HCU-HQQD]; *see also* Mark Harley & Geographic Data Technology, Inc., *Timing is Everything: Keeping Spatial Data Meaningful*, ESRI: ARCUSER (Mar. 2003), http://www.esri.com/news/arcuser/0103/timing1of2.html [https://perma.cc/6VQE-FCYA] (explaining that geospatial data producers must keep in mind that spatial information is ever evolving, and it must be maintained to ensure it is meaningful to end users).

but which are not the intention of the sale, are not treated the same as specific service transactions.[36]

C. Hybrid Product-Services

Ultimately, many geospatial data producers lie in a grey area of creating both a product and providing a service. They offer geospatial data products and they provide services in the form of data updating.[37] Often, these occur simultaneously. In these situations, courts have to figure out how to reconcile the product-services distinction and apply the appropriate legal theories or laws. Most courts do one of two things: 1) separate the product from the service and evaluate each part separately for its respective liability; or 2) if it is impossible to separate the service from the product, determine which quality predominates—service or product—and apply liability accordingly.[38] Still, some courts use a "professional/commercial test."[39] Following this test, if the defendant is deemed a professional and the transaction depends on the defendant's expertise, the transaction will be considered professional and will not be subject to strict products liability.[40]

With geospatial data producers, it is likely that either of the first two approaches discussed above could result in similar conclusions about their liability. For example, where a determination is made through separate analyses of the products and services portions of the geospatial data, the producer is still liable because either the data itself or the producer's failure to update the data caused the harm. The only difference would be how the plaintiff recovers damages. Where the determination is made by deciding which quality predominates, the producer could be liable under either negligence or products liability, regardless of whether it is the incorrect data itself or the failure to update the data that caused the injury. Finally, the geospatial data producer may be regarded as a professional, and the transaction between the producer and the user might rest on the producer's expertise. While the geospatial data producer could be an expert, obtaining and using geospatial data does not require the ex-

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36. *See* Bonna Lynn Horovitz, Note, *Computer Software as a Good Under the Uniform Commercial Code: Taking a Byte Out of the Intangibility Myth*, 65 B.U. L. REV. 129, 154-55 (1985).

37. *See, e.g.*, *Harris Geospatial Marketplace*, HARRISGEOSPATIAL (2017), https://www.harrisgeospatial.com/Portals/0/pdfs/HG_Marketplace_brochure_WEB.pdf [https://perma.cc/3A24-2Q68]; *Solutions*, MAGNOLIA RIVER, http://www.magnolia-river.com/solutions/ [https://perma.cc/5VER-SKME] (follow "GIS" hyperlink; then follow "Data Services" hyperlink) (as a specific example of data updating services).

38. Powers, Jr., *supra* note 16, at 430-32.

39. David W. Lannetti, *Toward a Revised Definition of "Product" Under the Restatement (Third) of Torts: Products Liability*, 35 TORT & INS. L.J. 845, 866 (2000).

40. *Id.* at 866-67.

pertise of the producer; anyone can create and publish geospatial data for use by others. However, a transaction resting on the expertise of the producer may arise when the user depends on the producer to keep the data up-to-date.

At least one court has conducted the products-services analysis on a case-by-case basis.[41] Rather than applying any of the three methods above to cases involving hybrid products-services, the court used the method that is most applicable to the particular case at hand.[42] This is arguably the best method of determining how liability should apply on a products-services distinction. Geospatial data producers likely tread the line of products and services, but this often depends on who the producer is, who the user is, what the data is, and how the data is being used. Producers who continually update data for the user tend to look like they are providing a service. At the same time, the producer is providing the data as a product, much like an aeronautical chart. Thus, applying a negligence theory of liability would be the fairest way to allocate responsibility, as geospatial data does not neatly fit into either the products or services categories.

By contrast, the Restatement (Third) of Torts has done away with a products-services distinction altogether by stating in its comments that when a plaintiff's grievance is with the information in the medium—not the medium in which it is presented—then it is not subject to products liability.[43] Again, it follows that a negligence theory of liability would be the most applicable theory in the absence of strict liability. Geospatial data *can* be represented on physical maps like aeronautical charts, but the data can also simply exist as numbers, figures, or descriptions in the abstract, contained not in a representative medium but in a storage medium (like a USB drive or cloud storage). Thus, the vast majority of claims will be against the *information*, and producers would not be subject to negligence as opposed to products liability.

For now, it remains to be seen how much credence courts will give the Restatement's theory, but the products-services distinction remains important to courts in determining liability.

41. Johnson v. Sears, Roebuck & Co., 335 F. Supp. 1065, 67 (E.D. Wis. 1973) ("[T]he decision to impose strict liability should be made on an ad hoc basis. In each case the decision should be based on the facts . . . .").

42. *Id.*

43. RESTATEMENT (THIRD) OF TORTS: PRODS. LIAB. § 19 cmt. d (AM. LAW INST. 1998).

III. LIABILITY OF GEOSPATIAL DATA PRODUCERS

A. Contract Liability

A contract can be formed between the geospatial data producer and the user when one party offers terms of agreement, the other party accepts those terms, and money is exchanged for the product or service.[44] In a contract claim, a party must show that the contract was breached, which does not necessarily include showing fault of the other party.[45]

If a contract exists between the geospatial data producer and the user, and if the data does not live up to the quality promised, then the user may have a breach of contract claim. However, contract liability can only go so far to protect geospatial data users. Geospatial data producers can disclaim or waive warranties, releasing them from liability when their product does not meet the user's expectations.[46] In this way, contract law fails to protect users where there is no contract over the use of the data—such as data that is publicly available. However, the merits and flaws of contractual liability surrounding geospatial data producers will not be discussed further in this Note.

B. Tort Liability

Tort liability under a negligence theory requires that a party has a duty to another, that the duty was breached by the party to whom the duty attaches, that the breach results in a harm to the other party, and that the party's breach was a cause of the user's harm.[47] Under a strict liability scheme, fault does not matter; it only requires that a breach occurred, regardless of whether the defendant acted negligently.[48]

1. Products Liability

Products liability is a type of strict liability. There are three types of products liability: manufacturing defect, design defect, and failure to warn. Under a manufacturing defect claim, the plaintiff must show that the product was created with defects that are unreasonably dangerous to the user, and that the defect did not occur during the

44. *See* U.C.C. § 2-204 (AM. LAW INST. & UNIF. LAW COMM'N 2003); *see id.* § 2-206.

45. Eric A. Posner, *Fault in Contract Law*, 107 MICH. L. REV. 1431, 1433 (2009).

46. *See* U.C.C. § 2-316 (AM. LAW INST. & UNIF. LAW COMM'N 2003).

47. RESTATEMENT (THIRD) OF TORTS: LIAB. FOR PHYSICAL AND EMOTIONAL HARM §§ 3, 6, 7, 26, 29, 30 (AM. LAW INST. 2005).

48. RESTATEMENT (SECOND) OF TORTS § 402A cmt. a (AM. LAW INST. 1965).

transportation of the product to the user.[49] In a design defect claim, the plaintiff must show that there is a flaw in the design of the product that causes it to be dangerous, and that it caused harm to the user.[50] As for a failure to warn claim, the plaintiff must show that there is some latent, dangerous aspect of the product, and that the producer failed to adequately warn the user of the dangers.[51]

Regarding manufacturing defects, the Ninth Circuit held that information communicated by an aeronautical chart was a "component" of the chart, and that the manufacturer of the chart was strictly liable for the defects in the chart even if "the defect [could] be traced to a component part supplied by another."[52] The court based this decision on three justifications: 1) the publisher had the ability to detect errors and fix them; 2) the publisher could seek indemnification from the government; and 3) the publisher advertised that the charts were accurate in every detail.[53] Additionally, failure to modify the incorrect information (such as putting it into chart form) does not absolve the publisher of strict liability.[54]

The California Court of Appeals addressed design defects in *Fluor Corp. v. Jeppesen & Co.*[55] The court found that incorrectly labeling an aeronautical chart in regards to the elevation of a hill amounted to a design defect.[56] The incorrect labeling was a design defect because it failed to adhere to the design standard it set forth regarding the labeling of the highest points in congested areas.[57] Additionally, the legend on the chart would indicate to pilots that the highest points below the aircraft were demarcated on the chart.[58] Because this information was erroneous and misleading, it could expose pilots to substantial danger.[59]

Some have argued that geospatial data producers should be held strictly liable under a failure-to-warn theory. Jennifer Chandler and Katherine Levitt argue that geospatial data producers have a duty to

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49. LOUIS R. FRUMER & MELVIN I. FRIEDMAN, 2 PRODUCTS LIABILITY § 11.02(2)(a) (1976).

50. Thibault v. Sears, Roebuck & Co., 395 A.2d 843, 846 (N.H. 1978) (citing James A. Henderson, Jr., *Judicial Review of Manufacturers' Conscious Design Choices: The Limits of Adjudication*, 73 COLUM. L. REV. 1531, 1543 (1973)).

51. Jennifer A. Chandler & Katherine Levitt, *Spatial Data Quality: The Duty to Warn Users of Risks Associated with Using Spatial Data*, 49 ALTA L. REV. 79, 94 (2011).

52. Brocklesby v. United States, 767 F.2d 1288, 1295 (9th Cir. 1985).

53. *Id.* at 1295-96.

54. *Id.*

55. 216 Cal. Rptr. 68 (Cal. Ct. App. 1985).

56. *See id.* at 72.

57. *See id.* at 71-72.

58. *Id.* at 72.

59. *Id.* at 73.

warn of dangers known and dangers which should be known.[60] This includes reasonably foreseeable misuses, unintended uses, and issues with verifying or measuring the quality of the data.[61] The authors argue that a failure-to-warn theory of strict liability will best balance costs versus quality and differences in quality standards among data intended for different uses.[62] While this is a fair conclusion, it only works where geospatial data is defined as a product. As discussed previously, this is often not a clear-cut distinction, and it places geospatial data producers into this grey area between providing both a product and a service.[63]

2. Negligence

Geospatial data producers should be held to a negligence theory of liability rather than a strict liability theory, because geospatial data is neither a product nor a service exclusively. Negligence requires that the defendant assume a duty of care to the plaintiff. Failure to exercise reasonable care can, and generally does, result in a breach of that duty.[64] If a negligence theory is applied to geospatial data producers, it is not clear to what standard of care geospatial data producers are held to. To date, there is no case law or statute which suggests a standard of care for geospatial data producers; however, a standard of care can be extrapolated from other related fields of information.[65]

In imposing a negligence theory of liability on geospatial data producers, some kind of duty must be assigned. While there has not been one all-encompassing duty or standard of care applied to geospatial data producers, there are types of duty that can be examined. These types of duty are may be split along private versus public and professional versus nonprofessional lines.[66]

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60. Chandler & Levitt, *supra* note 51, at 95.

61. *Id.* at 97.

62. *Id.* at 94.

63. *See supra* Part II.C.

64. RESTATEMENT (THIRD) OF TORTS: LIAB. FOR PHYSICAL AND EMOTIONAL HARM § 7 (AM. LAW INST. 1998).

65. For example, aeronautical charts and books. *See, e.g.*, Reminga v. United States, 631 F.2d 449 (6th Cir. 1980) (aeronautical charts); Medley v. United States, 543 F. Supp. 1211 (N.D. Cal. 1982) (aeronautical charts); Allnutt v. United States, 498 F. Supp. 832, 834 (W.D. Mo. 1980) (aeronautical charts); Saloomey v. Jeppesen & Co., 707 F.2d 671 (2d Cir. 1983) (aeronautical charts); Winter v. G.P. Putnam's Sons, 938 F.2d 1033 (9th Cir. 1991) (books).

66. *See* Jennifer L. Phillips, *Information Liability: The Possible Chilling Effect of Tort Claims Against Producers of Geographic Information Systems Data*, 26 FLA. ST. U. L. REV. 743, 754-60 (1999).

(a) Duty of Government Producers

Where the government is the producer of geospatial data, some have suggested that the government has a duty to ensure that the information it wants to convey is accurate—that is, whether a reasonable standard of care was exercised by the government to reduce data errors.[67] This level of care may increase with the likelihood of injury from inaccurate data.[68] However, the government may be able to release itself from liability where the geospatial information was created "in accordance with controlling statutory or regulatory authority,"[69] but this loophole is not guaranteed.

Relatedly, the Federal Tort Claims Act fails to provide the government protection against negligence claims. The Federal Tort Claims Act generally allows the federal government to take the place of the defendant in a lawsuit where a federal employee acted negligently, wrongfully, or failed to act within the scope of their employment with the federal government.[70] Essentially, "the federal government acts as a self-insurer" against lawsuits.[71]

In *Indian Towing Co. v. United States*, a private boat ran aground when the Coast Guard failed to keep a lighthouse in working order.[72] The government argued that it was not liable, as the actions it performed were not the kind that a private individual also performed.[73] In other words, if it was a "uniquely governmental" action, then the government was not liable under the Federal Tort Claims Act.[74] The United States Supreme Court disagreed with this argument, stating that "it is hard to think of any governmental activity . . . which is 'uniquely governmental,' in the sense that its kind has not at one time or another been, or could not conceivably be, privately performed."[75] The Court further held that "[t]he Coast Guard need not undertake the lighthouse service."[76] The Court went on to note that "once [the Coast Guard] exercised its discretion to operate a light . . . and engendered reliance on the guidance afforded by the

67. *Id.* at 754.

68. *Id.* at 760 (citing McCain v. Fla. Power Corp., 593 So. 2d 500, 503 (Fla. 1992)).

69. *Id.* at 756.

70. *Federal Tort Claims Act*, U.S. HOUSE REPRESENTATIVES, https://www.house.gov/doing-business-with-the-house/leases/federal-tort-claims-act [https://perma.cc/RNQ3-2A84].

71. *Id.*

72. Jeremy Speich, Comment, *The Legal Implications of Geographical Information Systems (GIS)*, 11 ALB. L.J. SCI. & TECH. 359, 384-85 (2001) (citing Indian Towing Co. v. United States, 350 U.S. 61 (1955)).

73. *Indian Towing Co.*, 350 U.S. at 64.

74. *Id.*

75. *Id.* at 68.

76. *Id.* at 69.

light, it was obligated to use due care to make certain that the light was kept in good working order."[77]

The implication of this case, with regard to geospatial data, is that the government cannot exempt itself from liability simply because private companies and private individuals also produce geospatial data. However, an individual could bring a suit under the Federal Tort Claims Act against the government for inaccurate geospatial data that results in some harm.

Similarly, in *Reminga v. United States*, a small private plane struck a guy wire[78] attached to a television tower and crashed, killing the occupants of the plane.[79] The top of the tower was obscured by clouds, rain, and snow.[80] The plane was flying 450 feet above the ground and approximately 1900 feet from the tower when it struck the guy wire, which extended 2500 feet from the tower.[81] The guy wire had no lights or markings to alert pilots at night.[82] A suit was brought against the U.S. government alleging that the sectional chart, which was produced by the Federal Aviation Administration, was negligently created because the location of the tower was incorrectly depicted.[83]

The Sixth Circuit found that the U.S. government was negligent in producing the chart and caused the crash.[84] Although not required by law, the court found that when the U.S. government produces aeronautical charts upon which pilots must necessarily rely, the government has a duty to use due care in accurately depicting what the charts claim to show.[85] The pilot had three miles of visibility when he was twelve miles from the destination airport, but the deteriorating conditions required him to descend to a lower altitude.[86] As he approached the towers, the top of the tower was obscured, and the guy wires had no identifying signals.[87] Thus, it was necessary for the pilot to rely on the sectional chart to know where the obstructions were

77. *Id.*

78. A guy wire is a wire attached to a free-standing structure to provide support and stability. Colton Radford, *Why Is it Called Guy Wire?*, U.S. CARGO CONTROL (Sept. 3, 2015), http://blog.uscargocontrol.com/why-is-it-called-guy-wire/ [https://perma.cc/J5TW-ABX8].

79. Reminga v. United States, 631 F.2d 449, 450 (6th Cir. 1980).

80. *Id.* at 451.

81. *Id.*

82. *Id.*

83. *Id.* at 450-51.

84. *Id.* at 458.

85. *Id.* at 452.

86. *Id.* at 451-52.

87. *Id.* at 452.

located.[88] The inaccuracy of the depictions of the obstructions caused the plane crash.[89]

Finally, in *Medley v. United States*, two planes crashed after following a mountain pass route marked on sectional charts published by the U.S. government.[90] Here, "the two pilots unknowingly entered the Center Basin blind canyon, and unable to navigate out of it due to the performance capabilities of their aircrafts, [they fatally] crashed into the canyon."[91] Three suits were brought against the United States and consolidated under *Medley*. The suits alleged that the government was negligent in charting the route through the Center Basin blind canyon because there were other, less dangerous routes the government could have chosen.[92] The court found the government could be held liable for charting this route because the government has a duty to accurately represent the features it claims to show.[93] The government claimed to show safe flight paths and had a duty to accurately depict those, but it failed to meet that duty of care in this case.

Yet the government has been able to escape liability where statute or regulatory authority did not require certain elements to be depicted on a map or chart.[94] In *Allnutt v. United States*, the court found that the government was not liable when two pilots struck powerlines that were not depicted on the aeronautical chart.[95] Although the government has a duty "to accurately represent those features it attempts to portray," rules promulgated by the Inter-Agency Cartographic Committee did not require powerlines to be depicted on aeronautical charts.[96] Thus, the government was not liable.[97]

(b) Duty of Private Producers

The duty that might attach to private producers of geospatial data is not as clear as the duty of government producers. However, it appears as though courts have found a duty similar to government producers for private producers with regards to aeronautical charts.[98]

88. *Id.*
89. *Id.* at 458.
90. Medley v. United States, 543 F. Supp. 1211, 1214 (N.D. Cal. 1982).
91. *Id.*
92. *Id.* at 1216.
93. *Id.* at 1222-23.
94. Phillips, *supra* note 66, at 756.
95. Allnutt v. United States, 498 F. Supp. 832, 834, 842 (W.D. Mo. 1980).
96. *Id.* at 838, 841.
97. *Id.* at 844.
98. *See* Saloomey v. Jeppesen & Co., 707 F.2d 671, 678 (2d Cir. 1983).

The suit in *Saloomey v. Jeppesen & Co.* arose when an experienced pilot crashed his plane upon descent into a small airport.[99] The pilot used aeronautical charts purchased from Jeppesen which depicted his initial desired destination—Danbury, Connecticut.[100] However, at some point during the flight, the pilot decided to land at the airport in Martinsburg, West Virginia.[101] He did not have the approach charts for Martinsburg, but the Washington area charts indicated that the Martinsburg airport was equipped with an instrument landing system (ILS).[102] However, the Martinsburg airport did not have a full ILS—it had a localizer beam but no glidescope beam.[103] Upon nearing the Martinsburg airport, the pilot requested ILS, and the airport confirmed it; however, it is not definitive whether the airport fully heard this request due to the communication being interrupted by another pilot's transmission.[104] He was instructed not to descend until he crossed a particular point in the sky.[105] Shortly after this communication, the plane crashed as it flew too low and struck a ridge.[106]

The court held that it was reasonable for the jury to conclude that the pilot would not have attempted to land at the Martinsburg airport but for the incorrect ILS designation on the chart.[107] Had the chart not indicated that the Martinsburg airport had a full ILS, the pilot would not have attempted to land there. Thus, Jeppesen was liable for negligently labeling the chart.[108] Although the court did not specifically address duty, by upholding the jury's verdict regarding Jeppesen's negligence in producing the chart, the court acknowledged that Jeppesen had a duty to accurately depict what it attempted to portray.[109]

By contrast, courts are not ready to put a duty of care on all producers of information. For example, the Ninth Circuit concluded that book publishers have no duty to investigate the accuracy of the claims contained in literature they print and publish.[110] The court

99. *Id.* at 672-73.

100. *Id.* at 672.

101. *Id.*

102. *Id.* at 672-73.

103. *Id.* at 672. A full ILS system requires both a localizer beam and a glidescope beam. *See id.*

104. *Id.* at 673.

105. *Saloomey*, 707 F.2d at 673.

106. *Id.*

107. *Id.* at 678.

108. *See id.* at 671.

109. *See id.* at 678. That is, Jeppesen attempted to portray the Martinsburg airport as being equipped for certain landing conditions; specifically, being equipped for a full ILS landing. *Id.* at 673.

110. Winter v. G.P. Putnam's Sons, 938 F.2d 1033, 1037 (9th Cir. 1991).

reasoned there was "nothing inherent in the role of publisher[s]" that suggests such a duty should be imposed upon them.[111] However, a distinction can be drawn between a book publisher and a geospatial data producer. Book publishers collect information from authors in the form of drafts and manuscripts and then publish this information. In this situation, authors have done the bulk of the work—gathering sources, doing research, and putting together a cohesive piece of literature—leaving editors to check for grammar, spelling, and organization. Geospatial data producers, on the other hand, are more like authors as they collect information, perform research, and put together all of the gathered data for further dissemination. Therefore, there seems to be a greater inherent duty in geospatial data producers to ensure that the information is correct than there is for publishers.

To impose such a duty on book publishers, the court said, would infringe upon First Amendment rights and may chill the social value of free speech.[112] However, the court conceded that had the publisher investigated the content of the book and put an express warranty about the accuracy of the information on the book, they would be open to liability over potential misinformation contained within the book because they assumed the duty.[113] If this reasoning were to be applied to geospatial data producers, it would require that courts evaluate data as a form of speech. While some scholars have suggested that data be considered speech protected by the First Amendment,[114] no court has yet to make this categorization with regard to geospatial data.

(c) Duty of Users

There have been several recent incidents where drivers blindly follow directions provided by their GPS devices and end up crashing their cars,[115] ending up on taxiways,[116] driving into ponds,[117] or creating other dangerous situations. Arguments have been made that a comparative or contributory negligence scheme might be the fairest

111. *Id.*

112. *Id.*

113. *See id.* at 1037 n.7.

114. Jane Bambauer, *Is Data Speech?*, 66 STAN. L. REV. 57, 60-61 (2014).

115. *Driver Crashed After Following GPS into Head-on Traffic, Police Say*, WJAC (Mar., 18, 2019), https://wjactv.com/news/local/driver-crashed-after-following-gps-into-head-on-traffic-police-say [https://perma.cc/2EF7-BTAK].

116. Amanda Kooser, *Apple Maps Leads Drivers onto Alaska Airport Taxiway*, CNET (Sept. 20, 2013, 8:34 AM), https://www.cnet.com/news/apple-maps-leads-drivers-onto-alaska-airport-taxiway/ [https://perma.cc/GL2Z-SRXZ].

117. *Woman Blames GPS After Driving into River*, *supra* note 4.

theory of liability regarding GPS devices.[118] It allows blame to be placed upon drivers who indiscriminately heed the directions of their GPS devices while also requiring GPS device producers to accept responsibility for any inaccurate information.[119] Such a theory would closely parallel the Ninth Circuit's decision in *Aetna Casualty & Surety Co. v. Jeppesen & Co.*[120]

For example, in *De Bardeleben Marine Corp. v. United States*, a barge operator used an out-of-date Coast and Geodetic Survey chart produced by the United States government, and this inaccuracy resulted in the operator laying an anchor on a natural gas pipeline, causing it to rupture.[121] The court found that the government was not liable.[122] While the government argued an exemption under the Federal Tort Claims Act,[123] the court did not allow the government to escape liability because of such exemption; rather, the court did not place liability on the government because the barge operator used outdated maps when the government had published current maps.[124] Thus, it was the barge owner who was negligent, not the government, because the barge owner had a duty to use the most updated maps available but failed to do so.[125] The government only had a duty to provide accurate information, and it had done so by making current maps available.[126]

In another plane crash case, a district court found the pilots to be utterly free from liability when they followed an erroneous aeronautical chart.[127] The Ninth Circuit disagreed with this conclusion.[128] Instead, the Ninth Circuit found both the chart maker and the pilots at fault for the crash.[129] The pilots should not have been misled by the erroneous chart because they were required to have a "reasonable attention to duty" when consulting and relying upon the aeronautical charts in their plane.[130]

Lastly, in *Allnutt v. United States*, the court found that a pilot was contributorily negligent in his operation of an airplane which ulti-

118. *See* Saulen, *supra* note 30, at 186-90.

119. *See id.*

120. 642 F.2d 339, 343 (9th Cir. 1981).

121. De Bardeleben Marine Corp. v. United States, 451 F.2d 140, 141-42 (5th Cir. 1971).

122. *Id.* at 141.

123. *Id.* at 142-43.

124. *Id.* at 149.

125. *See id.*

126. *See id.*

127. Aetna Cas. & Sur. Co. v. Jeppesen & Co., 642 F.2d 339, 343 (9th Cir. 1981).

128. *Id.* at 343.

129. *Id.* at 343-44.

130. *Id.* at 343.

mately struck powerlines and fatally crashed.[131] Even though the powerlines were not depicted on the aeronautical chart, the pilot was a highly experienced commercial pilot and recognized the risks of low-level flight where powerlines may be present.[132] Flying at a speed of 100 miles per hour at an altitude of 100 feet was careless and reckless enough to make the pilot contributorily negligent in the crash.[133]

3. Liability Insurance for Geospatial Data Producers

Although the exact extent to which geospatial data producers may be liable is not fully certain, geospatial data producers have been purchasing liability insurance in the event they are sued over inaccurate data.[134] Currently, liability insurance policies are limited to geospatial datasets which have a high risk of harm, like those used in emergency management settings.[135] These policies are mainly purchased by private data producers, but there have been reports that some government agencies are taking out commercial liability insurance where the potential risk is too costly.[136]

Insurance companies protecting geospatial data producers require significant information about the producer before approving a policy.[137] In particular, insurance companies require that geospatial data producers have data quality standards in place to ensure the producer's "reliability and integrity."[138] These standards must be recognized and accepted in the industry, and they must also be employed by any subcontractors geospatial data producers use.[139] If there are no standards for a particular type of data, the geospatial data producer must show that they used competent and reasonable methods of quality assurance.[140]

There are also less formal ways of insuring against liability. Geospatial data producers can use disclaimers to tell end users that they cannot guarantee that the data is accurate, that there are no express or implied warranties attached to the data, and that users should use the data at their own risk.[141] However, these disclaimers provide no

131. Allnutt v. United States, 498 F. Supp. 832, 844 (W.D. Mo. 1980).

132. *Id.*

133. *Id.*

134. Epstein, *supra* note 32, at 212.

135. *Id.*

136. *Id.*

137. *Id.*

138. *Id.*

139. *Id.*

140. *Id.*

141. *See* IAN J. DUNCAN, NEGLIGENCE AND PROFESSIONAL MALPRACTICE RELATED TO GIS DATASETS, TEX. BUREAU ECON. GEOLOGY 41, 42 (2003), https://www.researchgate.net/publication/241774189_Negligence_and_Professional_Malpractice_Related_to_GIS_Datasets.

real protection against liability.[142] These statements are best suited for informing users about the limitations on the usability of the data rather than absolving the producer from responsibility.[143] It modifies the user's reliance and expectations about the data, but it still leaves the producer liable for systematic inaccuracies, poor data quality, and false or misleading representations of the data quality.[144]

Similarly, geospatial data producers can include a warning about the inherent risks in using the data, but this does little to protect producers from negligence claims. Warnings best protect against products, and thus, courts would have to recognize geospatial data producers as producing a product, rather than a service.

IV. PURE COMPARATIVE NEGLIGENCE AS A FAIR DISTRIBUTION OF LIABILITY

Geospatial data producers should be subject to a pure comparative negligence theory of liability. A pure comparative negligence theory apportions liability between the plaintiff and the defendant for their share of the negligence.[145] Thus, the plaintiff's damages are reduced by the proportion of the plaintiff's own negligence.[146] A comparative negligence theory allows producers to be held responsible for their misfeasance while also encouraging users to responsibly use geospatial data.

For example, assume a user obtains publicly available geospatial data from the internet. The user then uses this data to draw a map of natural gas pipelines under his house in order to safely dig a pool.[147] Not only does the data incorrectly identify the natural gas pipelines, but the user fails to project the shapefile[148] containing the water main data to the coordinate system used by the underlying parcel data. Thus, the natural gas pipelines data is shifted on the map from its accurate location in real life and is incorrectly labeled, making it seem like the pipelines avoid the user's desired location for his pool. The user then follows this information to dig a pool when he accidentally hits a natural gas pipeline, causing it to explode. The user sustains bodily and economic injuries. Under a pure comparative negligence theory of

142. *Id.* at 43.

143. *Id.*

144. *Id.*

145. 1 ARTHUR BEST, COMPARATIVE NEGLIGENCE LAW AND PRACTICE § 1.20 (Richard E. Kaye ed., 2018).

146. *Id.*

147. Assume the user is not required to have city officials verify this information, and that no other maps exist.

148. *What Is a Shapefile?*, ESRI (2016), http://desktop.arcgis.com/en/arcmap/10.3/manage-data/shapefiles/what-is-a-shapefile.htm [https://perma.cc/9LMZ-ZYKK].

liability, the user is partially liable, and the producer of the natural gas pipelines information is also partially liable.

This Note recognizes that most jurisdictions rarely apply different theories of negligence in a piecemeal fashion to different torts. More often, states will apply a single theory, for example comparative negligence, to all torts subject to negligence.[149] However, it is possible for a state to carve out exceptions to specific theories of negligence. For example, Indiana generally applies a *modified* comparative negligence theory where the defendant is barred from recovery if he or she is more negligent than the plaintiff.[150] This theory applies to all negligence tort claims except for claims against the state of Indiana under the Indiana Tort Claims Act[151] and medical malpractice claims.[152] Thus, in any state which does not already apply a pure comparative negligence theory of liability, an exception should be carved out for negligence claims against geospatial data producers, requiring a pure comparative negligence theory to be applied.

"There is nothing inherently fair about a defendant who is 10 [percent] at fault paying 100 [percent] of the loss, and there is no social policy that should compel defendants to pay more than their fair share of the loss."[153] Moreover, a pure comparative negligence theory "avoid[s] imposing penalties on a defendant based on the chance circumstances of a plaintiff's damages over which the defendant had no control."[154] That is, the defendant is only responsible for the damages his own negligence caused. However, it does not absolve either party of responsibility just because the other is also negligent. This encourages each party to take safety measures to avoid liability.

Conversely, Judge Posner suggests that this theory of liability is slightly economically inefficient. "[B]y assigning a greater portion of liability to the more negligent actor, [comparative negligence] might be viewed as addressing [the] failure to minimize [the cost of having and avoiding accidents] by giving greater incentives to the least cost avoider."[155] However, it also assigns a portion of the liability to the less negligent actor, who may also be incentivized to minimize the

149. Thomas R. Trenkner, *Modern Development of Comparative Negligence Doctrine Having Applicability to Negligence Actions Generally*, *in* 78 A.L.R.3d 339, 345-46 (1977).

150. IND. CODE § 34-51-2-5 (2018).

151. *Id.* § 34-51-2-2.

152. *Id.* § 34-51-2-1.

153. Brown v. Keill, 580 P.2d 867, 874 (Kan. 1978).

154. Benjamin H. Brodsky, *Refining Comparative Fault in Florida: A Causation Theory for Apportioning Fault*, FLA. BAR J. (Jan. 2015), https://www.floridabar.org/news/tfb-jounal/?durl=/divcom%2Fjn%2Fjnjournal01%2Ensf%2Fc0d731e03de9828d852574580042ae7a%2Ffdca56a1c382a2f985257db800516201%21OpenDocument%26Highlight%3D0%2C%2A [https://perma.cc/5CUQ-B7QX].

155. David W. Barnes & Rosemary McCool, *Reasonable Care in Tort Law: The Duty to Take Corrective Precautions*, 36 ARIZ. L. REV. 357, 367 (1994).

cost of having and avoiding accidents. This is inefficient because it causes "duplicative accident avoidance measures," whereas efficient incentives motivate only the least cost avoidant party to minimize the costs of having and avoiding accidents.[156]

Yet, the "duplicative accident avoidance measures"[157] taken in the context of geospatial data are valuable. On the one hand, it forces producers to ensure that the data they publish is accurate and high quality; on the other hand, it forces users to learn how to properly use geospatial data in the first place. Because this is such a new and publicly accessible field of science and technology, it is important to not discourage producers from publishing publicly available data by opening producers to full liability when the average person misuses this data without consequence to themselves. When the average user is forced to learn how to use the data, there is less potential for injuries and lawsuits to occur.

V. PURE COMPARATIVE NEGLIGENCE AVOIDS CHILLING THE SHARING OF INFORMATION

While users should be protected from harm, the sharing of information and data should not be chilled by fear of liability.[158] A strict liability theory, like products liability, could have this effect. If producers are held strictly liable for inaccuracies in their data, they may be reluctant to freely share this information with the public knowing that any defect in the data could open them up to expensive litigation.

Some scholars suggest that geospatial data producers' liability should be limited in order to avoid chilling the sharing of this information.[159] On the contrary, liability should not be limited altogether, but rather the appropriate theory of liability should be applied—a pure comparative negligence theory of liability. This theory shares the costs of liability and recognizes the role of the user in causing their own harm as much as it protects future users from negligence by geospatial data producers. Any level of liability has the chance of chilling the free exchange of information, but a pure comparative negligence theory adequately balances the interests of users and the interests of producers without unduly restricting the sharing of information.

Scholars also suggest the use of disclaimers which inform users of the limitations of the data by making all metadata known to help

156. *Id.* at 366-67 (citing RICHARD POSNER, ECONOMIC ANALYSIS OF LAW 124 (2d ed. 1977)).

157. *Id.* at 367.

158. *See* Phillips, *supra* note 66.

159. *See id.* at 776-77.

producers avoid liability.[160] This Note argues that geospatial data producers have a duty to inform users of the limitations of their data, and if they fail to do so, they are subject to liability under a negligence scheme. This duty arises from geospatial data producers' familiarity with their own data and their expertise compared to the average user. In fact, metadata is governed by existing standards under the Federal Geographic Data Committee Content Standard for Digital Geospatial Metadata and International Organization for Standardization.[161] Geospatial data producers are arguably the least cost avoidant in most situations. This Note still agrees that using disclaimers does help limit the chilling effect of liability, but they should not be used simply to avoid liability. Producers still have a duty to users to inform users of the limitations of their data. Overall, providing a disclaimer should not be a "get out of jail free" card for geospatial data producers.

VI. CONCLUSION

Although courts have not addressed to what extent geospatial data producers in particular are liable for inaccurate geospatial data, they have addressed other areas of are divided on whether geospatial data producers should be subject to strict liability. Sometimes, courts have found that aeronautical charts are subject to products liability because they are products—they are physical, tangible objects and can be mass produced. In other cases, courts have found that aeronautical charts are subject to negligence claims because the information contained in the charts causes the harm.[162] When these rationales are applied to geospatial data producers, it becomes apparent that geospatial data producers simultaneously provide a product in the form of a dataset and a service in the form of continuous updating.[163] Since geospatial data does not squarely fit into either category, a negligence theory of liability should be applied rather than strict liability in the form of products liability.

More specifically, a pure comparative negligence theory of liability should be applied to geospatial data producers where their data is inaccurate and causes harm. This can be accomplished by creating exceptions in state codes where a pure comparative negligence theory of liability is not applied, or no exception currently exists. While this does not preclude claims based on contract theories of liability, not only does holding producers responsible for inaccurate

160. *Id.* at 777.

161. ESRI, METADATA AND GIS (2002), http://www.esri.com/library/whitepapers/pdfs/metadata-and-gis.pdf [https://perma.cc/BQL6-U6S9].

162. *See supra* Part III.B.2.ii.

163. *See supra* Part II.C.

data encourage the best possible data to be disseminated, it prevents future accidents. Moreover, a pure comparative negligence theory of liability does not allow users to get away with their own negligence. This encourages users to learn how to use geospatial data and avoids fully chilling the sharing of geospatial data by geospatial data producers.