

State Regulation of GIS

Implementing the Surveyors' and GIS Professionals' Task Force Recommendations

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URISA Board of Directors

What are the Legal Responsibilities of Professional Land Surveyors ? (and Civil Engineers)

NCEES

National Council of Examiners
for Engineers and Surveyors

Model Law

one state's example

BORPELS

California Board of Registration
for Professional Engineers and Land Surveyors

California Business & Professional Codes

What are the Legal Responsibilities of Professional Land Surveyors ?

(and Civil Engineers)

California Professional Land Surveyors Act, § 8726

- a) Locates, establishes ... alignment or elevation for any **fixed works** ...
- b) Determines configuration of Earth's surface, or the **position of fixed objects** thereon
- c) Locates ... establishes ... any **property line** or **boundary of any parcel of land**, right-of-way, easement, or alignment
- e) Determines the position for any **monument or reference point** which marks a ... **boundary**, or **corner** ...
- g) Determines the information ... to be **shown on any map** or document prepared ... for functions described [above] ...
- m) Creates, ... or modifies ... **computerized data** in performance of the activities described [above]

Does This Mean Only Land Surveyors Can Create or Use GIS Data?

BORPELS

California Board of Registration
for Professional Engineers and Land Surveyors

Resolution # 98-03

" All of the electronic or computerized data **created, prepared, or modified** in connection with those subdivisions exhibited within **Geographic Information Systems (GIS)** and/or **Land information Systems (LIS)** **require licensure** as a professional land surveyor or registration as a professional civil engineer authorized to practice land surveying. "

Does This Mean Only Land Surveyors Can Create or Use GIS Data?

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Resolution # 98-03

" All of the electronic or computerized data created, prepared, or modified in connection with the use of the provisions exploited within Geograph Information Systems (GIS) and/or Land Information Systems (LIS), require licensure as a professional land surveyor or registration as a professional civil engineer authorized to practice land surveying."

RESCINDED
WITHDRAWN

Surveying Meets GIS

- Mapping traditionally done by Surveyors
- High skill and knowledge of **measurement and error adjustment**
- GIS maps have low accuracy, little control, **subject to inappropriate usage**
- **Health, Safety, & Welfare** of public in danger from misuse of GIS or bad GIS data
- GIS Professionals are practicing survey/mapping without a license
- Surveyor's professional codes **overreach** by including all manner of mapping, regardless of **purpose or use of GIS**
- No distinction between **original measurement** documentation and **representational, referential spatial diagrams**
- Criteria needed to distinguish Survey from other mapping
- "Surveyors' Full Employment Act"

NCEES Model Law

REVISED PREAMBLE

The term “**Practice of Surveying or Land Surveying**” within the intent of this Act shall mean providing, or offering to provide, professional services involving **both** (1) the **making of geometric measurements** of, and gathering related information pertaining to, the physical or legal features of the earth, improvements on the earth, the space above the earth, or any part of the earth; **and** (2) utilization and/or **development of these facts into survey products** such as graphics, digital data, maps, plans, reports, descriptions, and/or projects. Professional services include acts of consultation, investigation, testimony evaluation, expert technical testimony, planning, mapping, assembling, and interpreting gathered measurements and information related to any one or more of the following:

NCEES Model Law

Criteria for Distinguishing Survey Practice

REPRESENTATION

- A distinction must be made in the use of electronic systems **between** making or **documenting original measurements** in the creation of survey products, **versus** the copying, interpretation, or **representation of those measurements** in such systems.

USE

- Further, a distinction must be made according to the **intent, use, or purpose** of measurement products in electronic systems **to determine definitive location versus** the use of those products as a **locational reference for planning, infrastructure management, and general information.**

NCEES Model Law **EXCLUSIONS .6**

from the Practice of Surveying

All **inventory maps** and **databases** created by any organization, in either hardcopy or electronic form, of **physical features, facilities or infrastructure** that are **wholly contained within properties** to which they have **rights** or for which they have **management responsibility**.

The **distribution** of these maps and/or data bases **outside the organization must** contain appropriate **metadata** describing, at a minimum, the **accuracy**, **method of compilation**, **data source(s)** and **date(s)**, and **disclaimers of use** clearly indicating that the data are **not intended to be used as a survey product**.

USAGE Should Determine When GIS Needs Surveyor Supervision

- **Surveyor Supervision for:**
 - Determining Property Boundaries
 - Engineering Design Location of Fixed Works
 - Locating Elevation Contours or Shape of the Earth for Engineering Design, Land Development, etc.
 - Creating Survey Control Information
 - **Determining and Certifying Basemap Accuracy**
- **Non-Survey Responsibilities include:**
 - Infrastructure Inventory and Maintenance
 - Planning and Analysis
 - Environmental Management
 - Social, Demographic, Economic, Tax Maps
 - Guides, Educational, Advertising maps

This Is Our Best Effort

- **13 Months** of Negotiation, listening to each other, acknowledging and understanding
- **32 Task Force sessions**
- **650 Hours** of professional effort

The Politics of Acceptance

- This agreement is the **best** we have been able to **negotiate in good faith** with surveyor representatives.
- NCEES' modification of their Model Law according to these recommendations is **prerequisite to changing individual state's Professional Codes.**
- The Task Force recommendations represent the careful, professional analysis and negotiation by qualified representatives:
over 650 hours of professional effort
- NCEES working sub-committee has endorsed Model Law modification.

Proposed Actions

- **Continue the Dialog** in Open-minded Good Faith
- ✓ **Organizational Support** of Recommendations to **Modify NCEES Model Law**
- ✓ **Individual Support** of Recommendations to **Modify NCEES Model Law**
- **Organizational Support** for Changing **State Professional Licensing Laws**
- **Individual Support** for Changing **State Professional Licensing Laws**

What Should YOU Do ... NOW

- Find out what are **YOUR** state's laws **defining the practice of survey** related to **GIS data**.
- **IF** your state's laws **do not** seem to infringe on the activities of GIS Professionals, then continue to monitor any future attempts to change them.
- **IF** your state's laws **do** seem to **infringe** on the activities of GIS Professionals, then **support** these Task Force Recommendations for modifying the NCEES Model Law.
- Work with your state's Surveyor organizations!

eMail Your Thoughts on the NCEES Task Force

- Members of the Task Force
- Task Force Chair, **Jim Plasker:**

jplasker@asprs.org

NCEES TF Final Report

http://www.asprs.org/asprs/news/ncees_frame.html

Report Title: "GIS/LIS Addendum to the Report of the Task Force on the NCEES Model Law for Surveying"

Future Directions

- **GIS Professionals** are developing their own Professional Certification Codes
www.URISA.org/certification
- **GIS Professionals** should educate **GIS Users** about the limitations of GIS data and products
- **GIS Professionals** need to improve GIS maps:
 - **Explicit References to Data Sources**
 - **Adequate Metadata**, based upon ...
 - **Responsible Accuracy Assessment** conducted by Licensed Surveyors

Metadata Should Contain

- **Locational Accuracy**
- **Date of Data Capture**
- **Source Documents**
- **Method of Compilation**

What Is Appropriate GIS Accuracy?

What should the Locational Accuracy of GIS be?

- **Appropriate Accuracy** for Appropriate Applications
 - **Moderate** - used for reference
 - **High** - used for cadastral or engineering
 - **Maximum** - used for control or geodesy
- Accuracy is **Limited by the Resources Available** to Build the Map

NSSDA calculation form

National Standard for Spatial Data Accuracy

A Point number	B Point description	C x (independent)	D x (test)	E diff in x	F $(\text{diff in } x)^2$	G y (independent)	H y (test)	I diff in y	J $(\text{diff in } y)^2$	K $(\text{diff in } x)^2 +$ $(\text{diff in } y)^2$
									sum	
									average	
									RMSE _r	
									NSSDA	

NSSDA accuracy example

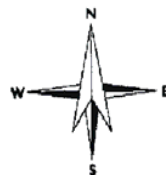
Point #	Point description	x (independent)	x (test)	diff in x	(diff in x) ²	y (independent)	y (test)	diff in y	(diff in y) ²	(diff in x) ² + (diff in y) ²
10751	r/w & lot line (m&b)	486062.125	486061.709	0.4	0.2	168699.106	168698.974	0.1	0.0	0.2
1100	r/w & lot line (platted)	480383.263	480380.433	2.8	8.0	168103.428	168103.496	-0.1	0.0	8.0
11730	r/w & lot line (m&b)	491133.630	491133.362	0.3	0.1	153041.796	153041.828	0.0	0.0	0.1
1382	r/w & lot line (platted)	462816.265	462816.057	0.2	0.0	166767.786	166767.874	-0.1	0.0	0.1
1397	r/w & lot line (platted)	470589.879	470588.959	0.9	0.8	166326.072	166325.827	0.2	0.1	0.9
1490	r/w & lot line (m&b)	492381.275	492381.352	-0.1	0.0	166191.528	166191.305	0.2	0.0	0.1
2901	r/w & lot line (m&b)	487165.209	487165.039	0.2	0.0	159005.809	159005.818	0.0	0.0	0.0
6180	r/w & lot line (platted)	461796.422	461795.986	0.4	0.2	172592.941	172593.162	-0.2	0.0	0.2
7100	r/w & lot line (platted)	466652.141	466651.230	0.9	0.8	162901.920	162901.132	0.8	0.6	1.5
lot_1_2	r/w & lot line (platted)	481423.044	481422.194	0.8	0.7	173240.868	173240.547	0.3	0.1	0.8
11840	r/w & lot line (platted)	491813.966	491813.949	0.0	0.0	147708.306	147708.645	-0.3	0.1	0.1
3960	r/w & lot line (platted)	483922.111	483922.116	0.0	0.0	153178.492	153178.429	0.1	0.0	0.0
4041	r/w & lot line (platted)	479920.587	479920.492	0.1	0.0	152711.877	152711.858	0.0	0.0	0.0
5120	r/w & lot line (platted)	475454.065	475453.940	0.1	0.0	147133.085	147133.258	-0.2	0.0	0.0
5549	r/w & lot line (platted)	469407.975	469407.927	0.0	0.0	144480.696	144480.912	-0.2	0.0	0.0
6391	r/w & lot line (platted)	463062.352	463062.426	-0.1	0.0	143447.557	143447.761	-0.2	0.0	0.0
6576	r/w & lot line (platted)	463813.337	463813.443	-0.1	0.0	155699.943	155700.107	-0.2	0.0	0.0
8009	r/w & lot line (platted)	472135.343	472135.103	0.2	0.1	153996.576	153996.484	0.1	0.0	0.1
9336	r/w & lot line (platted)	478399.063	478399.053	0.0	0.0	157767.858	157767.940	-0.1	0.0	0.0
9378	r/w & lot line (platted)	478840.112	478839.711	0.4	0.2	148370.597	148370.816	-0.2	0.0	0.2
4786	r/w & lot line (platted)	465173.302	465173.120	0.2	0.0	148308.262	148308.520	-0.3	0.1	0.1
									sum	12.5
									average	0.6
									RMSE	0.8
									NSSDA	1.3



**CITY OF
CHULA VISTA**

GEOGRAPHIC INFORMATION SYSTEM

**OBJECTS IN ~~MIRROR~~ GIS
ARE
CLOSER THAN THEY APPEAR**



1 inch = 200 feet



0 100 200 400 feet

Download This Presentation

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