

## Implementing the NCEES Model Law

### State Regulation of GIS

#### Implementing the NCEES Model Law for Surveyors and GIS Professionals

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### abstract

After 13 months of negotiation, representatives from five Surveyor and two GIS professional organizations reached agreement on the legal responsibilities of professional surveyors with respect to GIS. 18 months later, the NCEES officially changed its Model Law accordingly.

In order to implement these changes, each state needs to modify its own laws regulating professional licensure of surveyors. Discuss this opportunity to clarify your state's law, and learn what you can do to help.

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## Implementing the NCEES Model Law

### 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**

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### 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]** ....

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

Does GIS data “locate” or “establish” fixed works,  
boundary lines, etc.?

#### **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. "

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**RESCINDED  
WITHDRAWN**

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## Implementing the NCEES Model Law

### 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"

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### ASPRS-organized GIS – Surveyor Task Force

- **ASPRS** – Photogrammetry & Remote Sensing
- **MAPPS** – Photogrammetry & Mapping
- **ACSM** – Survey & Mapping
- **ASCE** – Civil Engineers
- **NSPS** – Professional Surveyors
- **URISA** – GIS Professionals
- **NSGIC** – State GIS Councils

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## Implementing the NCEES Model Law

### Task Force Review of NCEES Model Law

- Modify Preamble
- Modify Sub Paragraphs
- Add Exclusion & Inclusion Examples
- NCEES Approved Modification to its Model Law
- **Each State to Modify its Professional Laws**

#### NCEES TF Final Report

[http://www.asprs.org/asprs/news/ncees\\_frame.html](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"

NCEES Board reaction: "Draft Preliminary Report of the (internal) NCEES Task Force for Model Law for Surveying "

### Current NCEES Model Law and Model Rules (August 2003)

#### **NCEES.ORG**

[http://www.ncees.org/introduction/about\\_ncees](http://www.ncees.org/introduction/about_ncees)

#### Model Law

[http://www.ncees.org/introduction/about\\_ncees/ncees\\_model\\_law.pdf](http://www.ncees.org/introduction/about_ncees/ncees_model_law.pdf) pages 3 - 5

#### Model Rules

[http://www.ncees.org/introduction/about\\_ncees/ncees\\_model\\_rules.pdf](http://www.ncees.org/introduction/about_ncees/ncees_model_rules.pdf) pages 1 - 4

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# Implementing the NCEES Model Law

## Criteria for Distinguishing Survey Practice Using GIS from Other Uses of GIS

### 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.**

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## 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:

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### NCEES Model Law Sub-Paragraphs - modified

- (d) Creating, preparing, or modifying electronic or computerized data, **including land information systems, and geographic information systems**, relative to the performance of the activities in the above described items (a) through (c).
- (d) Creating, preparing, or modifying electronic or computerized data relative to the performance of the activities in the above described items (a) through (c).

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### NCEES Model Law **INCLUSIONS** in the Practice of Surveying

**Activities that must be accomplished under the responsible charge of a Professional Surveyor or Land Surveyor (unless specifically exempted in Section B, below) include, but are not limited to the following:**

**Adopted as NCEES Model Rules**

**[http://www.ncees.org/introduction/about\\_ncees/ncees\\_model\\_rules.pdf](http://www.ncees.org/introduction/about_ncees/ncees_model_rules.pdf)** ( pages 1 - 4 )

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### NCEES Model Law INCLUSIONS .1 in the Practice of Surveying

The creation of maps and geo-referenced databases **representing authoritative locations** for **boundaries, the location of fixed works, or topography**, by either terrestrial surveying methods, photogrammetric or GPS locations. This includes maps and geo-referenced databases prepared by any person, firm, or government agency **where that data is provided to the public as a survey product.**

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### NCEES Model Law INCLUSIONS .2 in the Practice of Surveying

Original data acquisition, or the **resolution of conflicts** between multiple authoritative data sources, **when used for the authoritative location** of features within the following data themes: geodetic control, orthoimagery, elevation and hydrographic, fixed works, private and public boundaries, and cadastral information.

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### NCEES Model Law INCLUSIONS .3 in the Practice of Surveying

**Certification of positional accuracy** of maps or measured survey data.

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### NCEES Model Law INCLUSIONS .4 in the Practice of Surveying

Measurement, adjustment, and **authoritative interpretation** of raw survey data.

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### NCEES Model Law INCLUSIONS .5 in the Practice of Surveying

GIS-based parcel or cadastral mapping **used for authoritative boundary definition purposes** wherein land title or **development rights** for individual parcels **are, or may be, affected**.

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### NCEES Model Law INCLUSIONS .6 in the Practice of Surveying

**Authoritative interpretation** of maps, deeds, or other land title documents **to resolve conflicting data elements within cadastral documents of record**.

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### NCEES Model Law INCLUSIONS .7 in the Practice of Surveying

Acquisition of field data required to **authoritatively position** fixed works or cadastral data to **geodetic control**.

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### NCEES Model Law INCLUSIONS .8 in the Practice of Surveying

Analysis, adjustment or transformation of cadastral data to improve the positional accuracy of the parcel layer(s) with respect to the geodetic control layer within a GIS **resulting in the affirmation of positional accuracy**.

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# Implementing the NCEES Model Law

## NCEES Model Law EXCLUSIONS from the PRACTICE of SURVEY

### Introduction:

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.

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.

The following items are **not** to be included as activities within the definition of surveying:

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## NCEES Model Law EXCLUSIONS .1 from the Practice of Surveying

The following items are **not** to be included as activities within the definition of surveying:

### The creation of **general maps**:

- a) Prepared by private firms or government agencies **for use as guides** to motorists, boaters, aviators or pedestrians;
- b) Prepared for publication in a gazetteer or atlas as an **educational tool or reference publication**.
- c) Prepared for or by **education institutions** for use in the **curriculum of any course of study**.
- d) Produced by any electronic or print media firm as an **illustrative guide** to the geographic location of any event.
- e) Prepared by lay persons for conversational or **illustrative purposes**. This includes **advertising material** and **users guides**.

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### NCEES Model Law EXCLUSIONS .2 from the Practice of Surveying

The **transcription** of geo-referenced data into a GIS or LIS by manual or electronic means, and the **maintenance** thereof, **provided the data are clearly not intended to indicate the authoritative location of property boundaries**, the **precise definition** of the **shape or contour of the earth**, and/or the **precise location** of fixed works of humans.

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### NCEES Model Law EXCLUSIONS .3 from the Practice of Surveying

The **transcription** of public record data, **without legal modification except for graphical purposes**, into a GIS- or LIS-based **cadastre** (tax maps and associated records) by manual or electronic means, and the **maintenance** of that cadastre, **provided the data are clearly not intended to authoritatively represent property boundaries**. This includes **tax maps** and **zoning maps**.

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### NCEES Model Law EXCLUSIONS .4 from the Practice of Surveying

The **preparation** of any document by any **Federal Government** agency that **does not** define **real property boundaries**. This includes civilian and military versions of **quadrangle topographic maps**, military maps, **satellite imagery**, and other such documents.

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### NCEES Model Law EXCLUSIONS .5 from the Practice of Surveying

The **incorporation or use** of documents or databases **prepared by any Federal agency** into a GIS/LIS, including but not limited to, Federal census and demographic data, quadrangle topographic maps and military maps.

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### 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**.

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### NCEES Model Law EXCLUSIONS .7 from the Practice of Surveying

Maps and data bases depicting the **distribution of natural resources** or **phenomena** prepared by foresters, geologists, soil scientists, geophysicists, biologists, archeologists, historians, or other **persons qualified to document such data**.

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### NCEES Model Law EXCLUSIONS .8 from the Practice of Surveying

All maps and geo-referenced databases depicting **physical features and events** prepared by any government agency **where the access to that data is restricted by statute**. This includes geo-referenced data generated by **law enforcement** agencies involving crime statistics and criminal activities.

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### 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

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## Implementing the NCEES Model Law

### The Politics of Acceptance

- This agreement is the **best** we have been able to **negotiate in good faith** with surveyor representatives.
- The Task Force recommendations represent the careful, professional analysis and negotiation by qualified representatives:  
**over 650 hours of professional effort**
- NCEES' modification of their Model Law according to these recommendations was **prerequisite to changing individual state's Professional Codes**.
- NCEES **accepted and published** these recommendations as their "Model Law" and "Model Rules" in August 2003.

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### 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**

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## Implementing the NCEES Model Law

### 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 seem to **infringe** on the activities of GIS Professionals, then **support the NCEES Model Law Recommendations**.
- Work with your state's Surveyor organizations to **change your state's professional codes** according to the NCEES Model Rules.

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### Organizations Organizing Changes to State Survey Licensure Laws

- ACSM - Curt Sumner CSumner@ACSM.net
- URISA - Bruce Joffe GIS.Consultants@joffes.com
- GITA - Bob Samborski BSamborski@gita.org
- ASPRS - Jim Plasker JPlasker@asprs.org
- NSPS - ?
- **CLSA** - ?
- Others - ?

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## Implementing the NCEES Model Law

### eMail Your Thoughts on the NCEES Task Force

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

[jplasker@asprs.org](mailto:jplasker@asprs.org)

**NCEES TF Final Report**

[http://www.asprs.org/asprs/news/ncees\\_frame.html](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"**

**Links to NCEES Model Law and Model Rules**

[http://www.ncees.org/introduction/about\\_ncees](http://www.ncees.org/introduction/about_ncees)

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### Future Directions

- **GIS Professionals** are developing **their own Professional Certification Codes**  
[www.URISA.org/certification](http://www.URISA.org/certification)
- **GIS Certification Institute**  
[www.GISCI.org](http://www.GISCI.org)
- **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

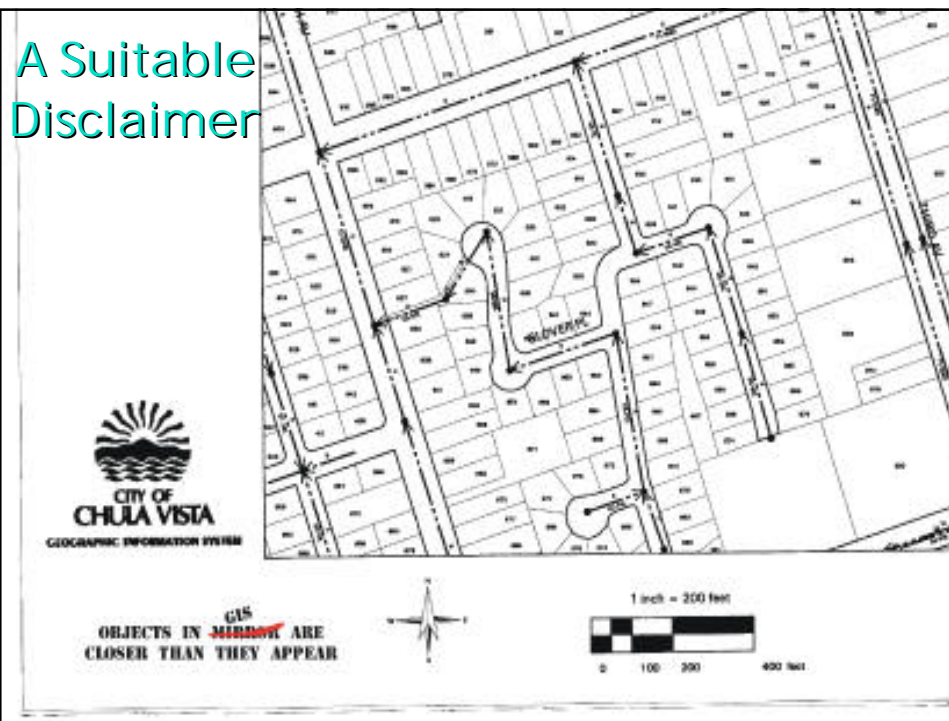
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### Metadata Should Contain

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

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file name:

**GIS\_Surveyor\_6-25-04.pdf**

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## State Regulation of GIS

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