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## State Regulation of GIS

Implementing the  
Surveyors' and GIS Professionals'  
Task Force Recommendations

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URISA Board of Directors

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## 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?

### 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**RESCINDED**  
**WITHDRAWN**

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## 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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## PROCESS Toward RESOLUTION

- **Workshops & Presentations to Professional Groups**
- **Multiple Professional Associations' Task Force Teleconference Negotiation / Resolution Meetings**  
(over 30 work sessions in one year )
- **Advocacy to Change NCEES Model Law & Current State Laws**
- **On-Line eForum**
  - △ A Structured Outline
  - △ Comments by Collaborative Members
  - △ Optional eMail "push"

[www.urisa.org/gispolicy.htm](http://www.urisa.org/gispolicy.htm)

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## 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
- **UCGIS** – University GIS Teachers and Scientists

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## Task Force History

- 1995 - NCEES Modifies Model Law to Include Photogrammetry and GIS/LIS
- 1996 - Concerns Raised/Letters Written by ASPRS, MAPPS, ASCE. Discussion at Winter NCEES/POLC Meeting
- 1997 - Five Organization Summit Meeting (ACSM, NSPS, MAPPS, ASPRS, ASCE)
- 1997 - Task Force Begins to Address Photogrammetric Issues
- 1998 - First Task Force Report to NCEES

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## Task Force History ( cont.)

- 1998 - NCEES Modifies Model Law to Include Savings Clause (Grandfather Language) per Task Force Recommendation
- 1999 - NCEES Modifies Model Law to Address Issues Related to Reciprocity/Comity and Ease of Mobility
- **1999 - Three GIS Organization Invited to Participate in Extension of Task Force to Address GIS/LIS Issues (URISA, NSGIC, UCGIS)**
- **1999 - 2000 - Task Force Addresses GIS/LIS Issues**

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## Task Force Review of NCEES Model Law

- △ Modify Preamble
- △ Modify Sub Paragraphs
- △ Add Exclusion & Inclusion Examples
- △ **Modification to NCEES 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 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** .

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## NCEES Model Law

### Philosophy Guiding the Recommendations

- 1) GIS databases and maps prepared to be simply referential, representational, or diagrammatic **portrayals of existing source documents** ... should **not** automatically fall under the requirement for **supervision by licensed professionals** , **unless** the use of the databases and/or maps are intended to serve as **authoritative public records for geographic location** .
- 2) GIS-based databases and maps that are intended to be used as the **authoritative document** for the location of parcels, fixed works, survey monuments, elevation measurements, etc., **must** be compiled under the **responsible charge of a Professional Surveyor** or Land Surveyor.
- 3) Because geospatial technologies are changing very rapidly, **references to specific technologies should be removed from the Model Law and State professional codes** .

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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:

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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 bathymetry, fixed works, government 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

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

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 **for purposes of affirming positional accuracy**.

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## 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 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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## 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

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## 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.

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## Proposed Actions

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

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## 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!

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## 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)

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## On-Line Electronic Forum GIS Basemap Responsibilities

[www.urisa.org/gispolicy.htm](http://www.urisa.org/gispolicy.htm)

### Topic # 11

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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 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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## Recommendations for Clarification / Improvement

- **PURPOSE** – Statement of the intent or purpose of the graphic representation
- **DISCLAIMERS** – "This data is NOT a professional work product as defined by sections of the Business and Professions Codes § 6700 -6799, 8700 - 8805 ..."
- **METADATA** – Need to document the source of the data

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## Metadata Should Contain

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

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## State Regulation of GIS

### Special Thanks To These Contributors:

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