

## KS\_MAP

### Korea Seismicity Map

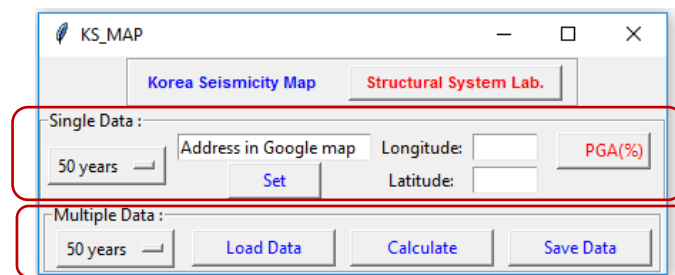
#### [1] Download

KS\_MAP.zip: [https://www.dropbox.com/s/hd1hs3u1wlmhqs/KS\\_MAP.zip?dl=0](https://www.dropbox.com/s/hd1hs3u1wlmhqs/KS_MAP.zip?dl=0)

Execution: Type "KS\_MAP.exe" on the command window.

Data File: "KSD.npz"

#### [2] Interactive Interface



Option 1

Option 2

KS\_MAP

#### [3] Updates

- Nov 21, 2017 Add option for multiple input data
- Jun 15, 2017 Korea Seismicity Map in Python
- March 11, 2017 Korea Seismicity Map in MATLAB

## KS\_MAP

# Korea Seismicity Map

Tran Thanh Tuan<sup>1</sup> and Dookie Kim<sup>2</sup>

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<sup>1</sup> Department of Civil and Environmental Engineering, Kunsan National University, South Korea

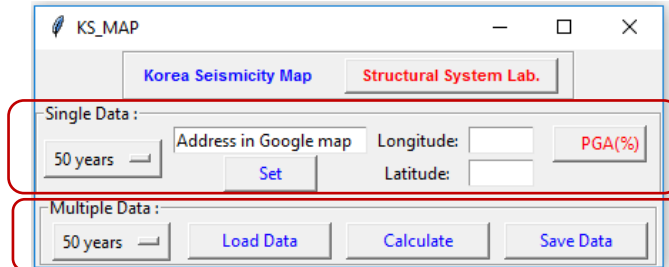
<sup>2</sup> Department of Civil and Environmental Engineering, Kunsan National University, South Korea

## 1. How to run KS\_MAP?

### 1.1 Initial values

Prepare all the text file of seismic maps.

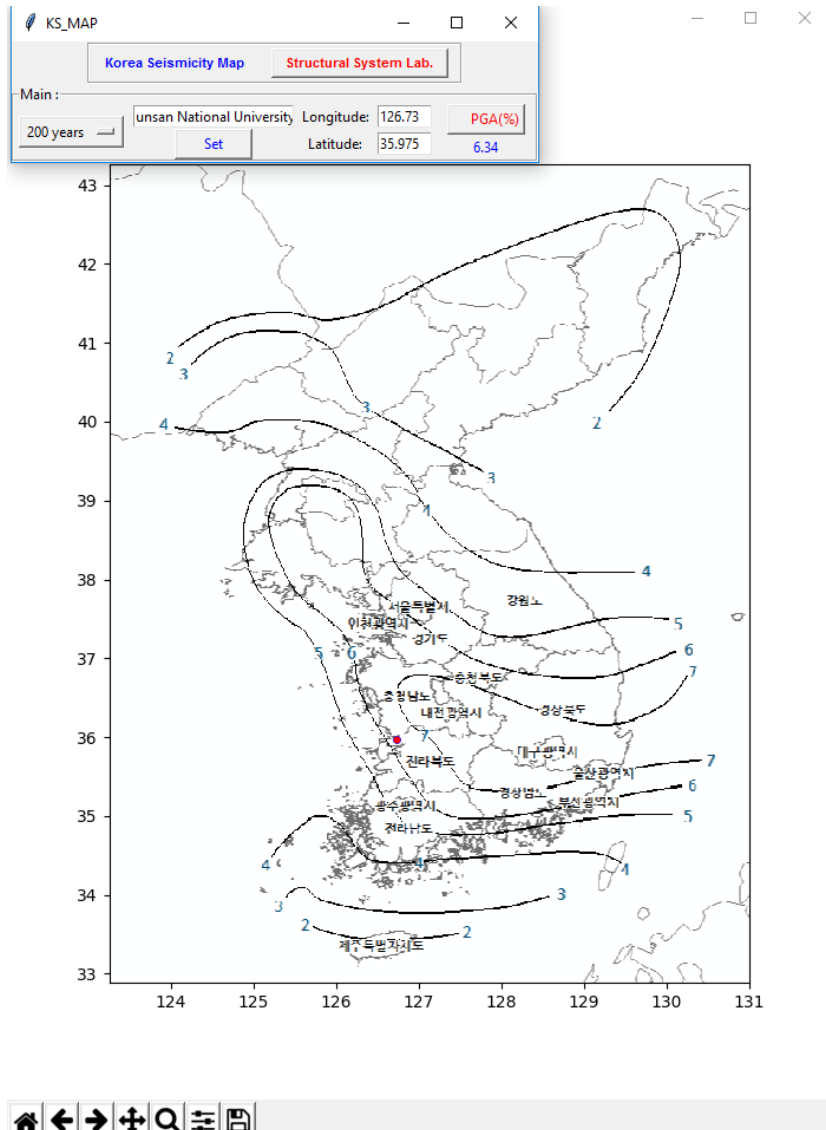
### 1.2 User's guide



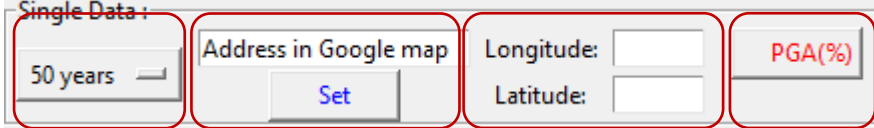
Option 1

Option 2

#### 1.2.1 Option 1



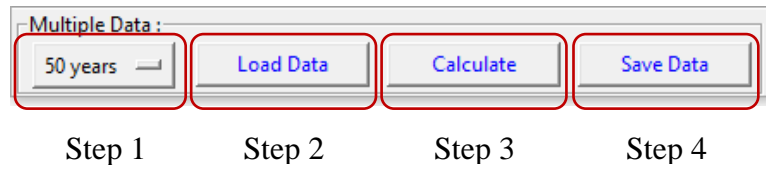
- STEP 1      Select the map (e.g. 2013-0050).
- STEP 2      Set the coordinate from the map: 3 options
- 2.1. Type address → Set. (English or Korean)  
    Ex: Seoul, 서울, Gunsan Korea, Kunsan National University, ..
  - 2.2. Mouse click on the map
  - 2.3. Type the coordinate at Longitude and Latitude entry
- STEP 3      Compute the PGA value (g).



The screenshot shows a software interface titled "Single Data :". It contains four main sections, each highlighted with a red box and labeled below:

- Step 1:** A dropdown menu currently showing "50 years".
- Step 2.1:** A text input field labeled "Address in Google map" with a "Set" button below it.
- Step 2.3:** Two text input fields labeled "Longitude:" and "Latitude:".
- Step 3:** A text input field labeled "PGA(%)" in red text.

### 1.2.2 Option 2



- STEP 1      Select the map (e.g. 2013-0050).
- STEP 2      Load input data (e.g. inData.txt).
- STEP 3      Compute the PGA value (g).
- STEP 4      Save File

## APPENDIX 1. Comparison of Seismic Hazard Maps of Korea: 지진재해지도(1997) and 국가지진위험지도(2013)

### A1.1 Importance Factor (위험도계수)

	재현주기	50 년	100 년	200 년	500 년	1,000 년	2,400 년	4,800 년
NEMA(2003)	위험도계수	0.4	0.57	0.73	1	1.4	2	2.6
EESK(1997)	위험도계수	0.4	0.57	0.73	1	1.4	2	

### A1.2 Zone Factor (지진구역계수)

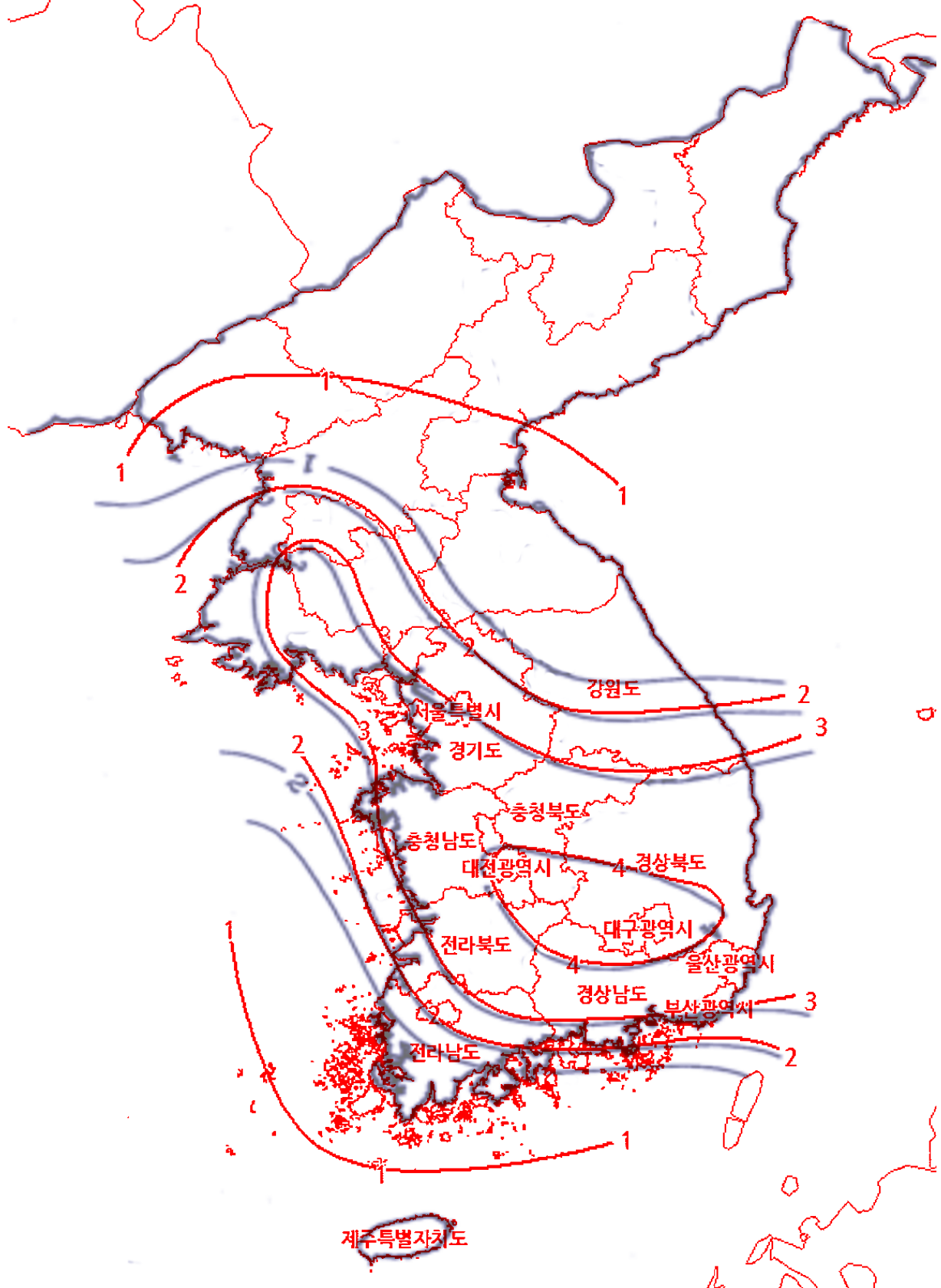
	지진구역	행정구역	지진구역계수
NEMA(2003)	I	시	0.11g
		도	
	II	도	0.07g
EESK(1997)	I	시	0.11g
		도	
	II	도	0.07g

### A1.3 Probabilistic Hazard Maps

### A1.3.1 Return Period: 50 years

EESK(1997): Peak Acceleration (%g) with 10% probability of exceedance in 5 years

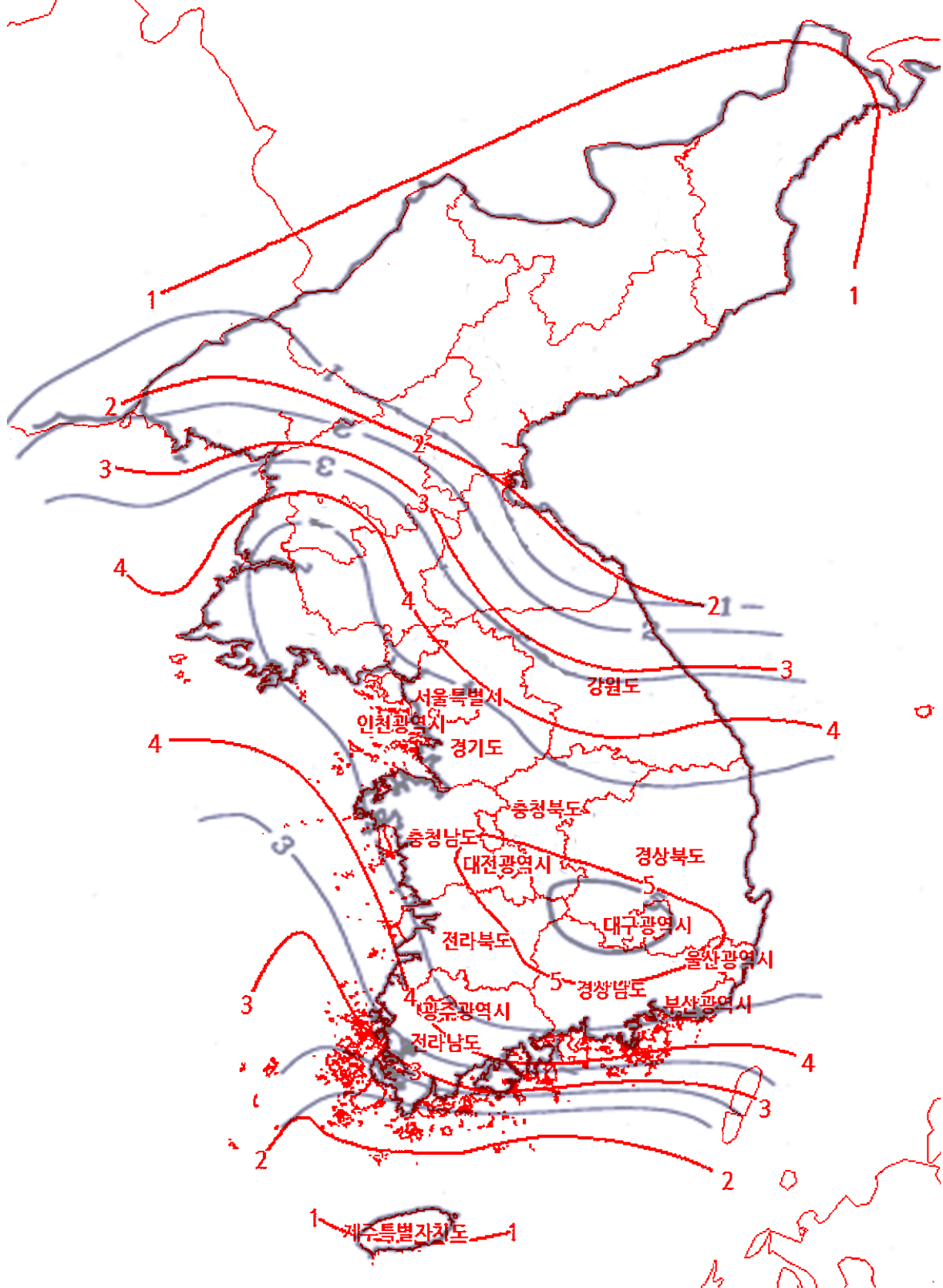
NEMA(2013): 재현주기 50년 국가지진위험지도



A1.3.2 Return Period: 100 years

EESK(1997): Peak Acceleration (%g) with 10% probability of exceedance in 10 years

NEMA(2013): 재현주기 100년 국가지진위험지도

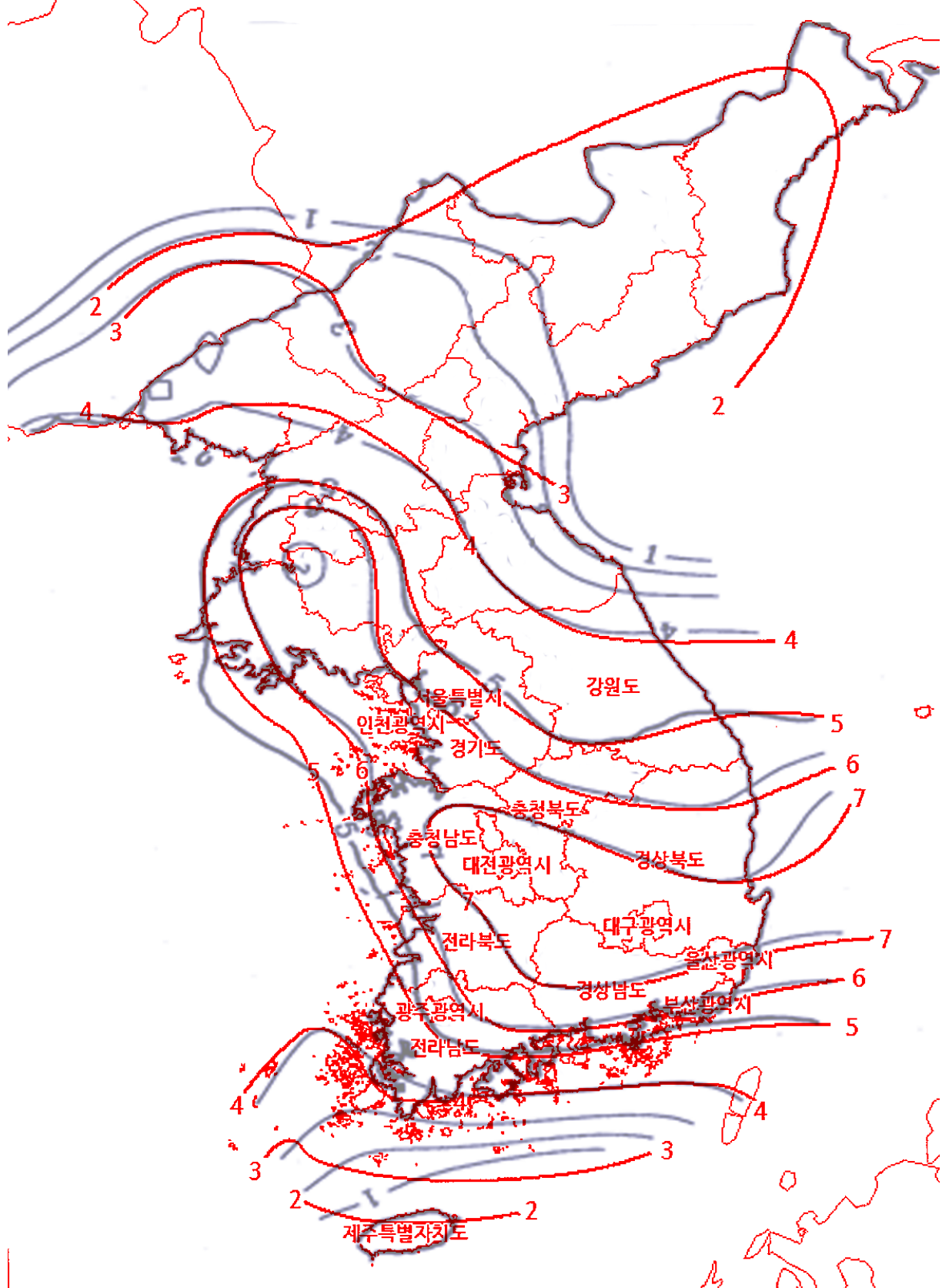




A1.3.3 Return Period: 200 years

EESK(1997): Peak Acceleration (%g) with 10% probability of exceedance in 20 years

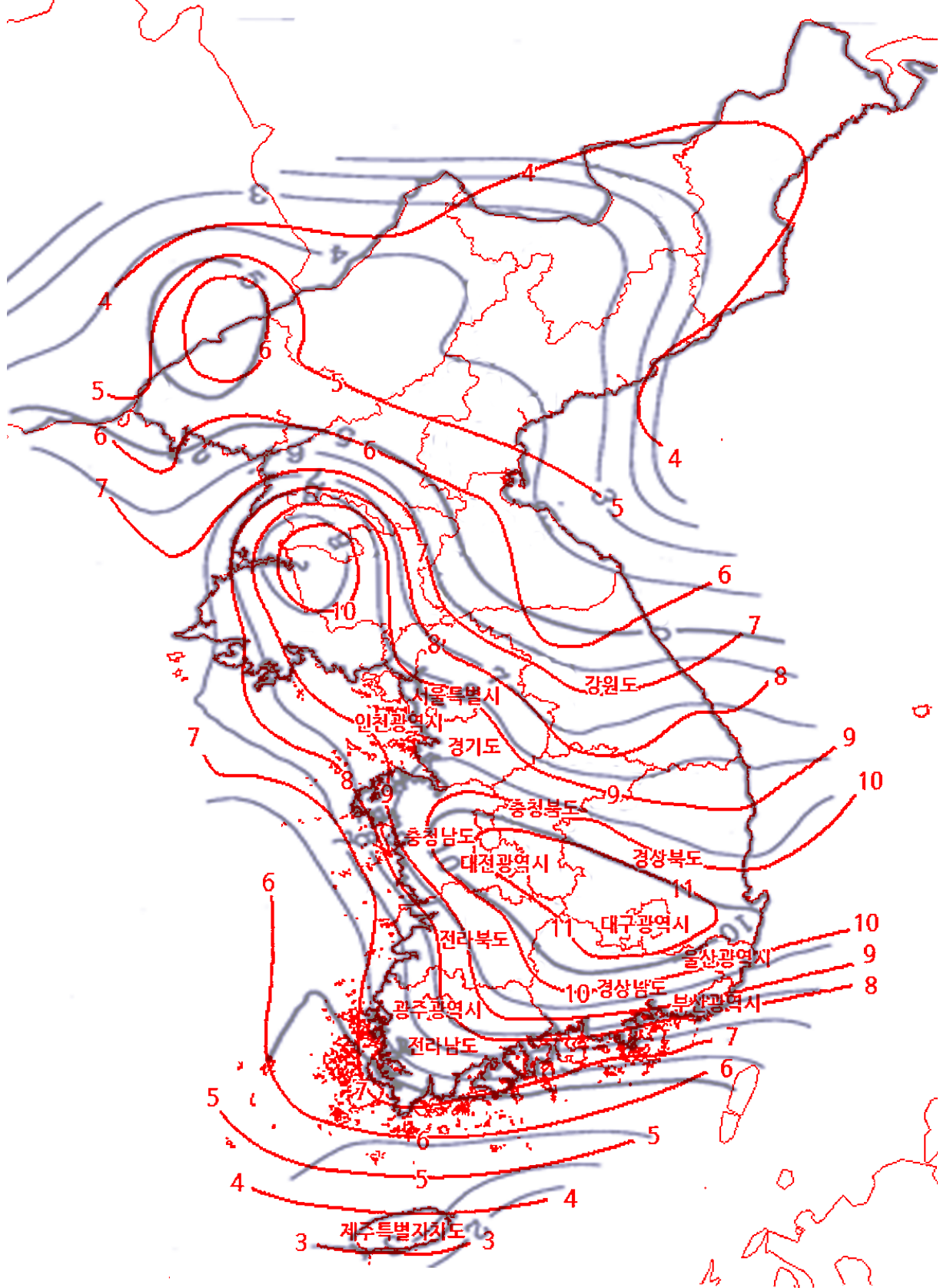
NEMA(2013): 재현주기 200년 국가지진위험지도



A1.3.4 Return Period: 500 years

EESK(1997): Peak Acceleration (%g) with 10% probability of exceedance in 50 years

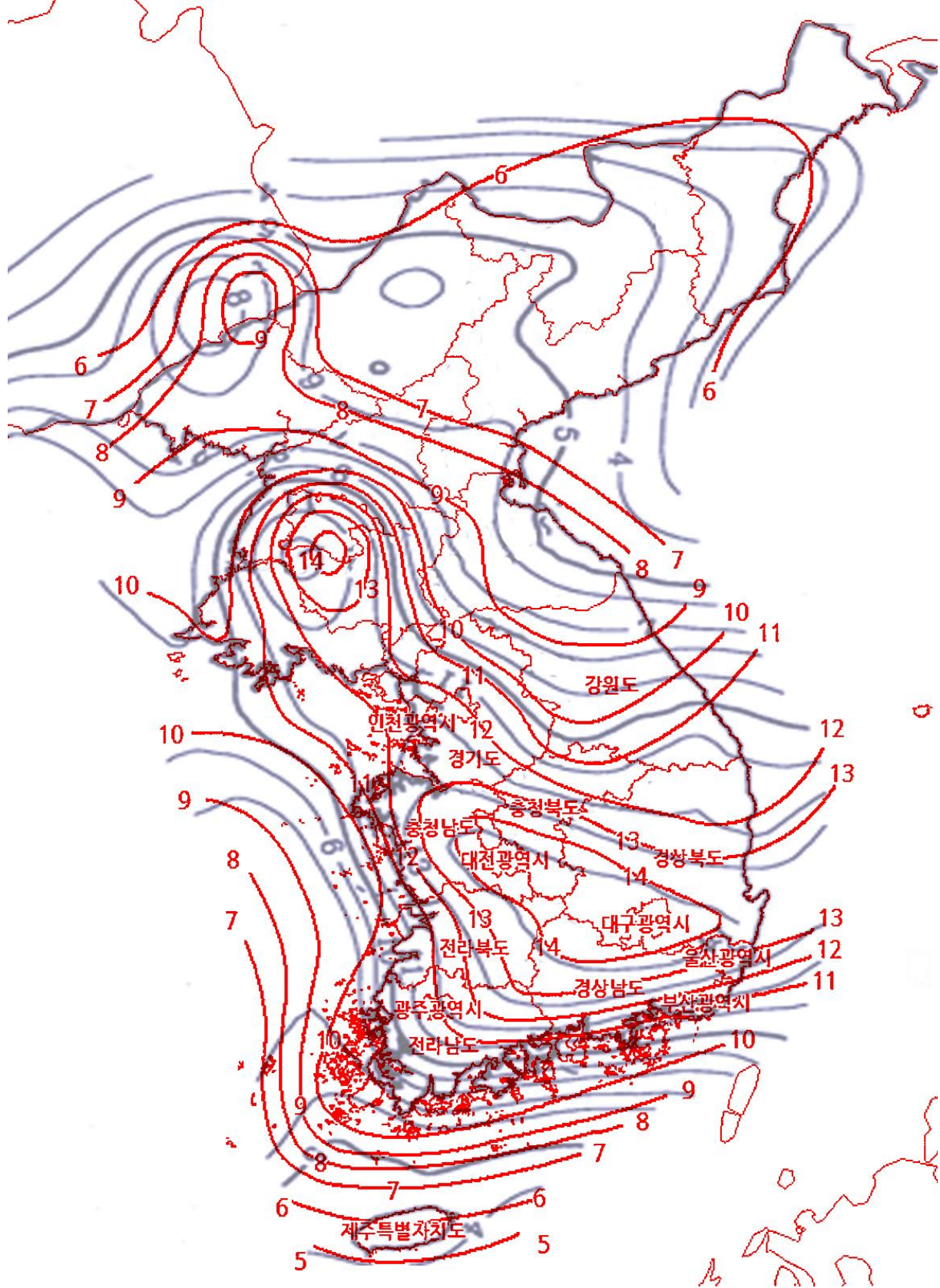
NEMA(2013): 재현주기 500년 국가지진위험지도



A1.3.5 Return Period: 1000 years

EESK(1997): Peak Acceleration (%) with 10% probability of exceedance in 100 years

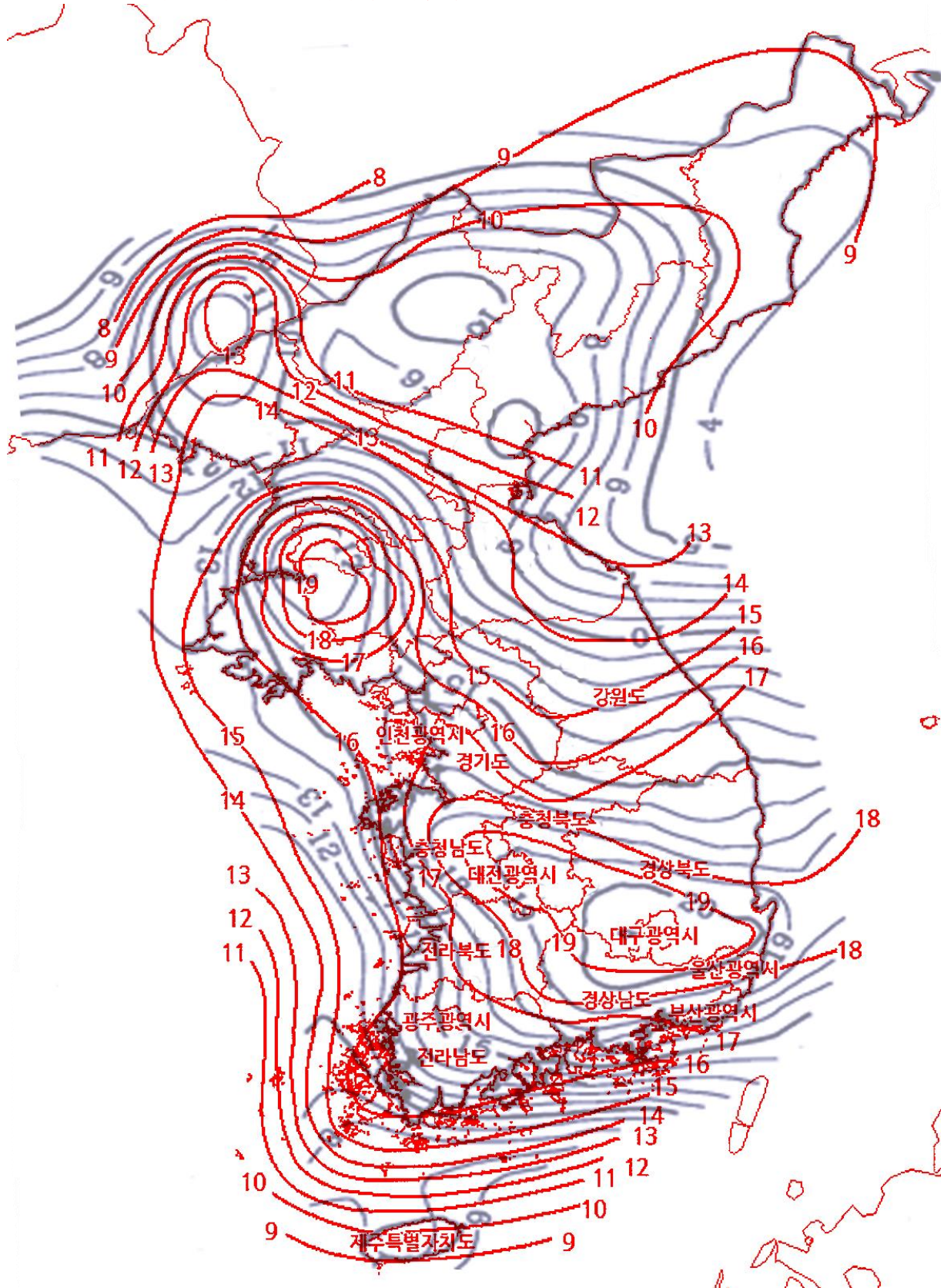
NEMA(2013): 재현주기 1000년 국가지진위험지도



A1.3.6 Return Period: 2400 years

EESK(1997): Peak Acceleration (%) with 10% probability of exceedance in 250 years

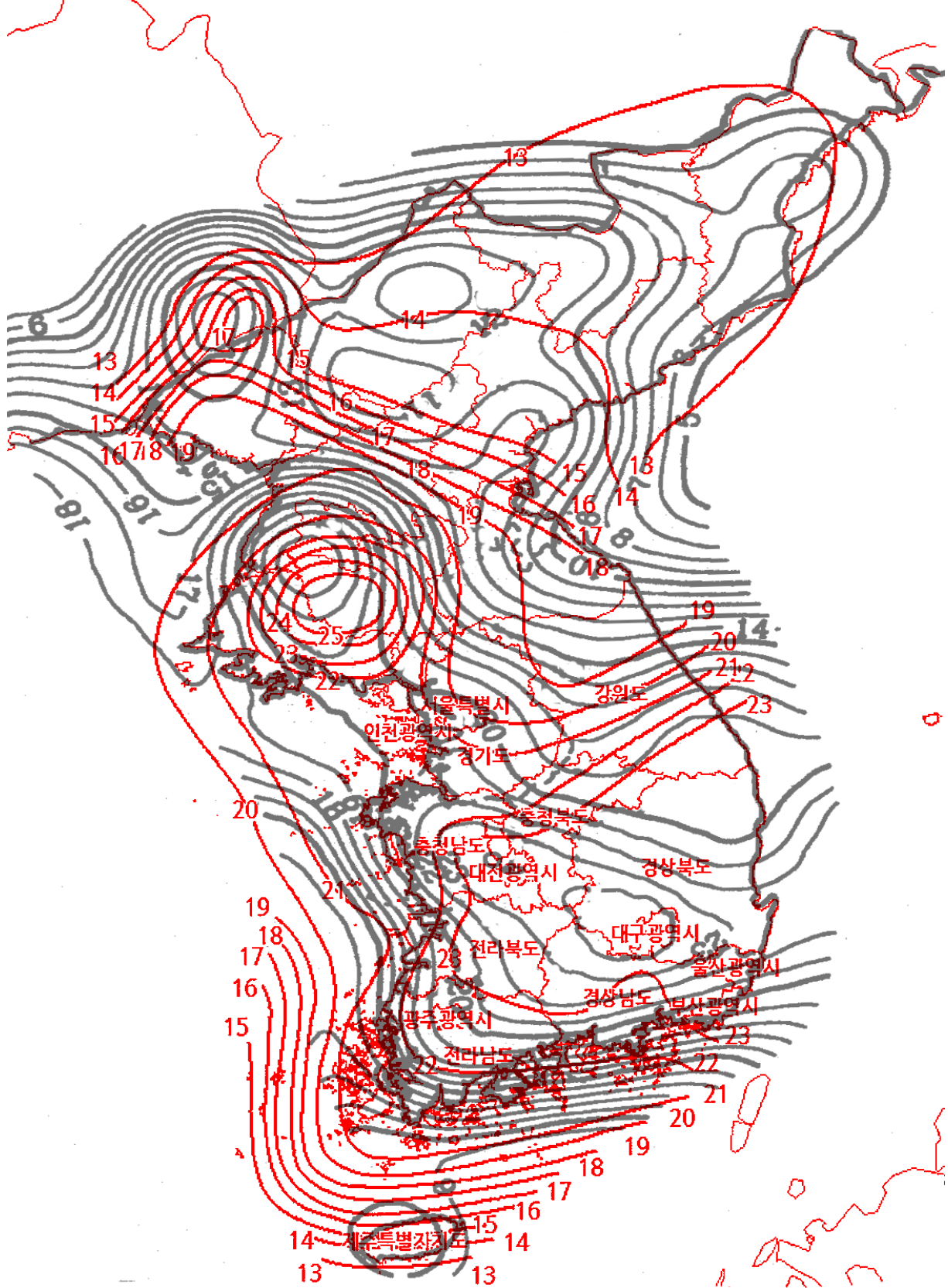
NEMA(2013): 재현주기 2400년 국가지진위험지도



A1.3.7 Return Period: 4800 years

EESK(1997): Peak Acceleration (%g) with 10% probability of exceedance in 250 years

NEMA(2013): 재현주기 4800년 국가지진위험지도



## A1.4 Review (고찰)

- 1997년 지도에 비해 세분화 되었지만, 기본 골격은 그대로 유지함.
- 단주기 스펙트럼가속도 값( $S_s$ )을 제시할 필요가 있음.

## A1.5 References

- Dookie Kim, Structural Dynamics: 6.11 Seismic Risk Assessment, 3rd Edition, Goomibook, 2013.  
[http://www.kim2kie.com/3\\_ach/book\\_strdyn.php](http://www.kim2kie.com/3_ach/book_strdyn.php)
- Spectra\_M: Design Response Spectra (DRS)  
국내외 설계응답스펙트럼을 비교 및 새로운 응답스펙트럼 작성  
[http://www.kim2kie.com/3\\_ach/SSL\\_Software.php](http://www.kim2kie.com/3_ach/SSL_Software.php)
- 한국지진공학회(EESK), 내진설계기준 연구 (II), 건설교통부, 1997.
- 소방방재청(NEMA), 국가지진위험지도, 2013.  
[http://www.nema.go.kr/include/download\\_file\\_conv.jsp?http://www.nema.go.kr/include/download\\_file\\_conv.jsp?fileName=국가지진위험지도 공표 공고문.pdf](http://www.nema.go.kr/include/download_file_conv.jsp?http://www.nema.go.kr/include/download_file_conv.jsp?fileName=국가지진위험지도 공표 공고문.pdf)

## References

- Clough, R.W. and J. Penzien (1975). Dynamics of Structures. New York: McGraw-Hill.
- Dookie Kim, Structural Dynamics: 2.4.2 Duhamel's integral method and piecewise exact method, 3rd Edition, Goomibook, 2013. [http://www.kim2kie.com/3\\_ach/book\\_strdyn.php](http://www.kim2kie.com/3_ach/book_strdyn.php)
- Dookie Kim, Structural Dynamics: 6.5.1 Response Spectrum Analysis, 3rd Edition, Goomibook, 2013. [http://www.kim2kie.com/3\\_ach/book\\_strdyn.php](http://www.kim2kie.com/3_ach/book_strdyn.php)
- Dookie Kim et al., "국내·외 발전설비 설계응답스펙트럼에 관한 고찰 (Comparison of Domestic and Foreign Seismic Design Response Spectra for Power Plant Facilities)," 한국지진공학회 2013년도 학술발표회 논문집, 서울대, 2013.03.15.  
[https://dl.dropbox.com/u/98535240/SSL/material\\_Spectra\\_M/Spectra%20%28kim2kie%29%202013-03-15.pdf](https://dl.dropbox.com/u/98535240/SSL/material_Spectra_M/Spectra%20%28kim2kie%29%202013-03-15.pdf)