# Appendix B Hazard Maps for the Eemskanaal Area of the Groningen field

Comparison of PGA hazard at the Eemskanaal cluster for different scenarios. TD, RTCiM denote the Time-Decay and Rate Type Compaction Isotach models. AR and SP denote the Activity Rate and Strain Partitioning models.

| Model | Prod Rate EKL | Compaction Model | Seismological Model | Hazard (PGA) 0.2%/year | 2%/year | 10%/year |
|---|---|---|---|---|---|---|
| WIPLA | | TD | AR | 0.35g | 0.11g | 0.03g |
| Prod Restriction | | TD | AR | 0.33g | 0.10g | 0.02g |
| WIPLA | | RTCiM | AR | 0.37g | 0.12g | 0.03g |
| Prod Restriction | | RTCiM | AR | 0.34g | 0.10g | 0.02g |
| Model 2 (str38) | 5 mln $Nm^3$/day | RTCiM | AR | 0.36g | 0.11g | 0.03g |
| Model 1 (str40) | 5 mln $Nm^3$/day | RTCiM | AR | 0.34g | 0.10g | 0.02g |
| Model 2 (str38) | 8 mln $Nm^3$/day | RTCiM | AR | 0.38g | 0.12g | 0.03g |
| Model 2 (str38) | 8 mln $Nm^3$/day | TD | AR | 0.36g | 0.11g | 0.03g |
| Model 1 (str40) | 8 mln $Nm^3$/day | TD | AR | 0.33g | 0.10g | 0.02g |
| Model 2 (str38) | 3 mln $Nm^3$/day | RTCiM | AR | 0.36g | 0.11g | 0.03g |
| Model 2 (str38) | 3 mln $Nm^3$/day | TD | AR | 0.35g | 0.11g | 0.03g |
| Model 1 (str40) | 3 mln $Nm^3$/day | RTCiM | AR | 0.34g | 0.10g | 0.02g |
| Model 1 (str40) | 3 mln $Nm^3$/day | TD | AR | 0.34g | 0.10g | 0.02g |
| Model 1 (str40) | 8 mln $Nm^3$/day | RTCiM | AR | 0.35g | 0.10g | 0.03g |
| Model 2 (str38) | 5 mln $Nm^3$/day | TD | AR | 0.35g | 0.11g | 0.03g |
| Model 1 (str40) | 5 mln $Nm^3$/day | TD | AR | 0.33g | 0.10g | 0.02g |
| WIPLA | | TD | SP | 0.35g | 0.10g | 0.03g |
| Prod Restriction | | TD | SP | 0.33g | 0.10g | 0.02g |
| WIPLA | | RTCiM | SP | 0.34g | 0.11g | 0.03g |
| Prod Restriction | | RTCiM | SP | 0.29g | 0.08g | 0.02g |
| Model 2 (str38) | 5 mln $Nm^3$/day | RTCiM | SP | 0.32g | 0.10g | 0.03g |
| Model 1 (str40) | 5 mln $Nm^3$/day | RTCiM | SP | 0.29g | 0.09g | 0.02g |
| Model 2 (str38) | 8 mln $Nm^3$/day | RTCiM | SP | 0.33g | 0.11g | 0.03g |
| Model 2 (str38) | 8 mln $Nm^3$/day | TD | SP | 0.36g | 0.11g | 0.03g |
| Model 1 (str40) | 8 mln $Nm^3$/day | TD | SP | 0.33g | 0.09g | 0.02g |
| Model 2 (str38) | 3 mln $Nm^3$/day | RTCiM | SP | 0.32g | 0.10g | 0.03g |
| Model 2 (str38) | 3 mln $Nm^3$/day | TD | SP | 0.35g | 0.11g | 0.03g |
| Model 1 (str40) | 3 mln $Nm^3$/day | RTCiM | SP | 0.29g | 0.09g | 0.02g |
| Model 1 (str40) | 3 mln $Nm^3$/day | TD | SP | 0.32g | 0.10g | 0.02g |
| Model 1 (str40) | 8 mln $Nm^3$/day | RTCiM | SP | 0.29g | 0.09g | 0.02g |
| Model 2 (str38) | 5 mln $Nm^3$/day | TD | SP | 0.36g | 0.11g | 0.03g |
| Model 1 (str40) | 5 mln $Nm^3$/day | TD | SP | 0.33g | 0.10g | 0.02g |

# Seismic Hazard Overview

## Activity Rate Model of Seismicity

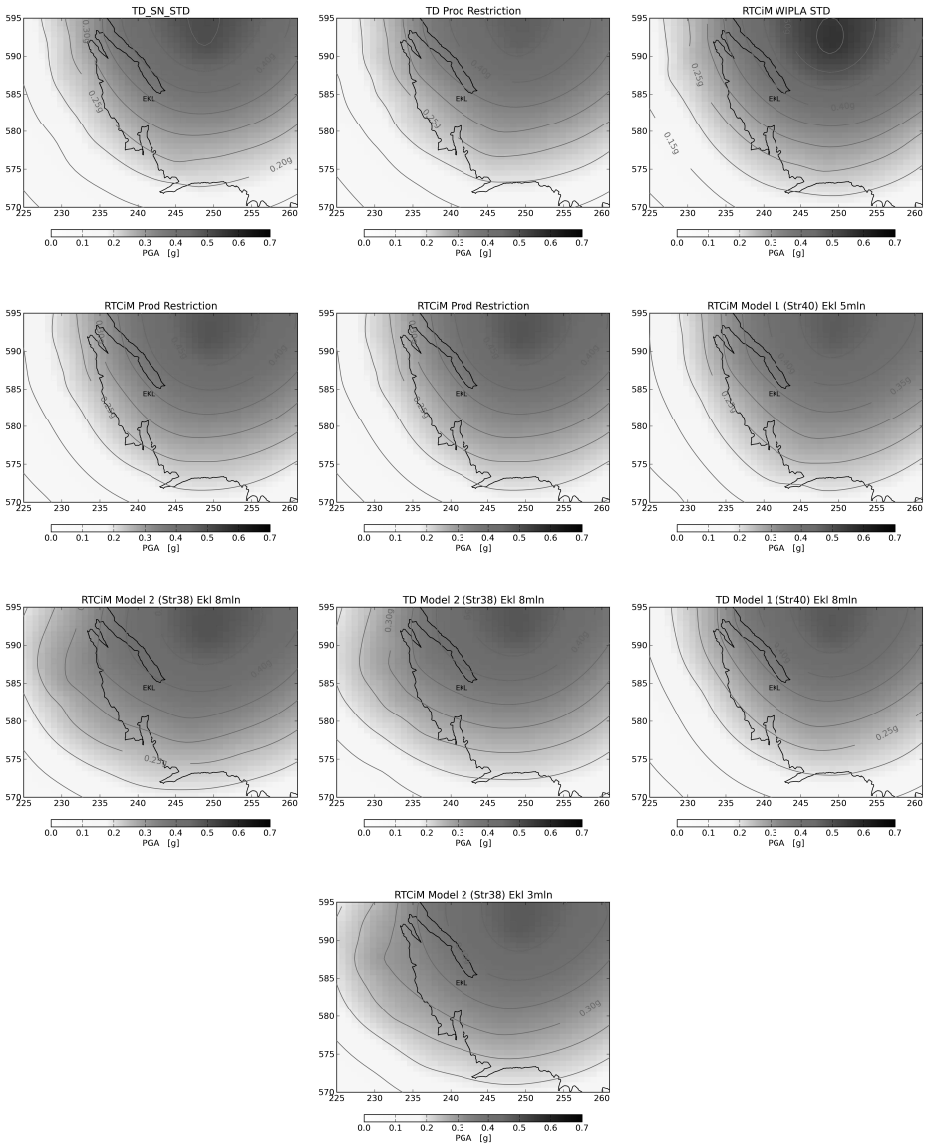


Figure 1: Hazard maps showing the peak ground acceleration (PGA) with a 0.2% average annual chance of exceedance from 2014 to 2017 and the Activity Rate seismological model for the different production scenarios and compaction models listed in Table 1. The contour interval is 0.05g.

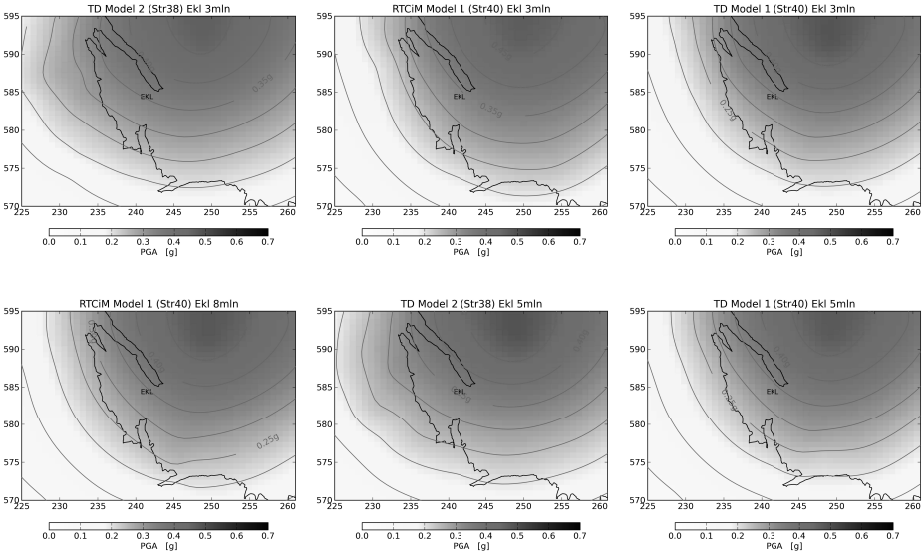


Figure 1 continued.

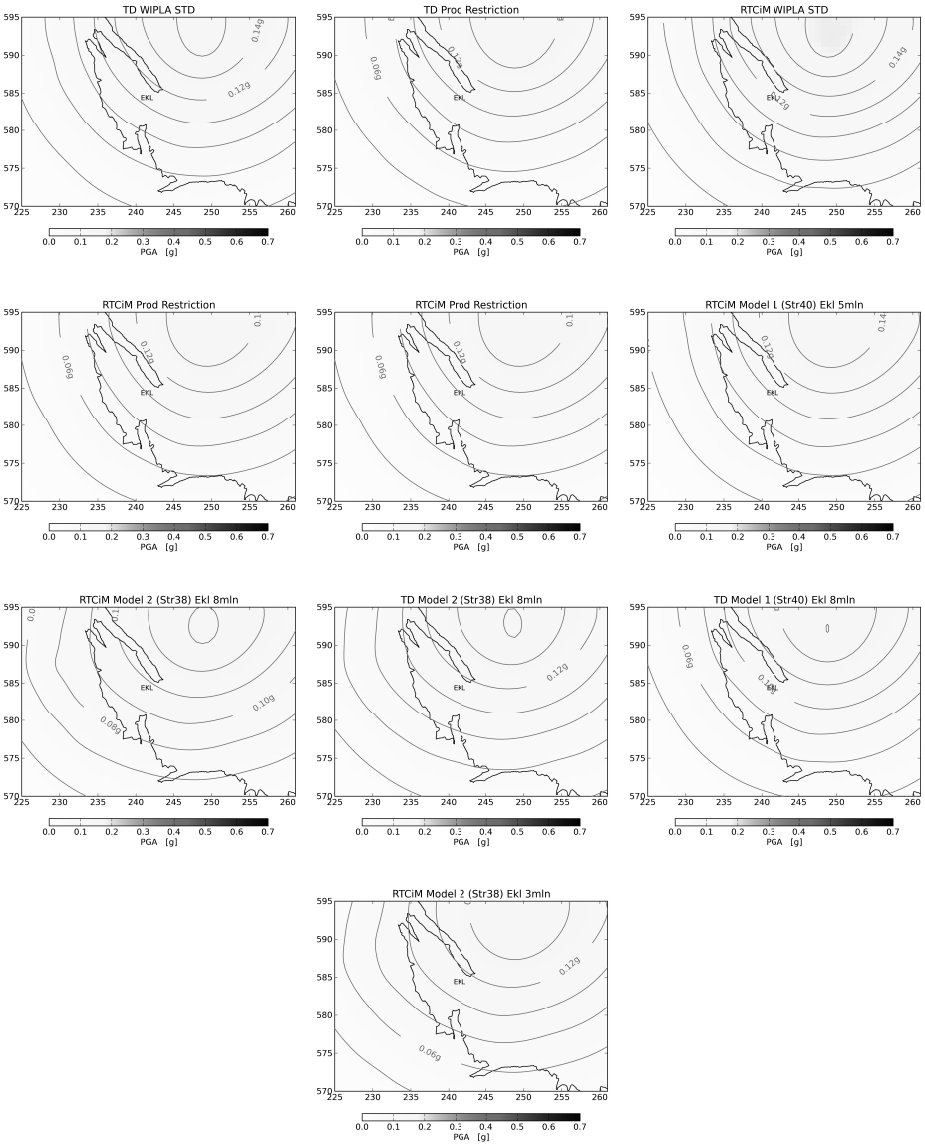


Figure 2: As Figure 1, except for a 2% average annual chance of exceedance. The contour interval is 0.02g.

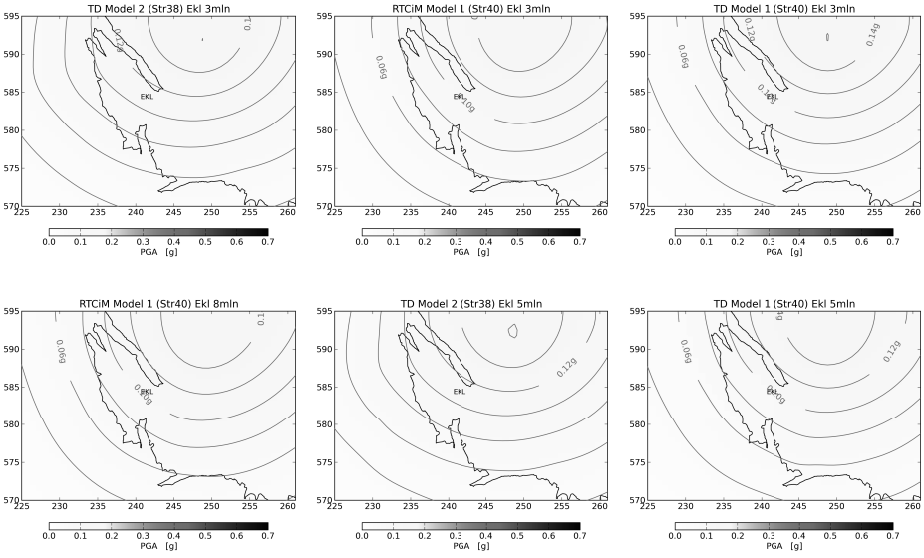


Figure 2 continued.

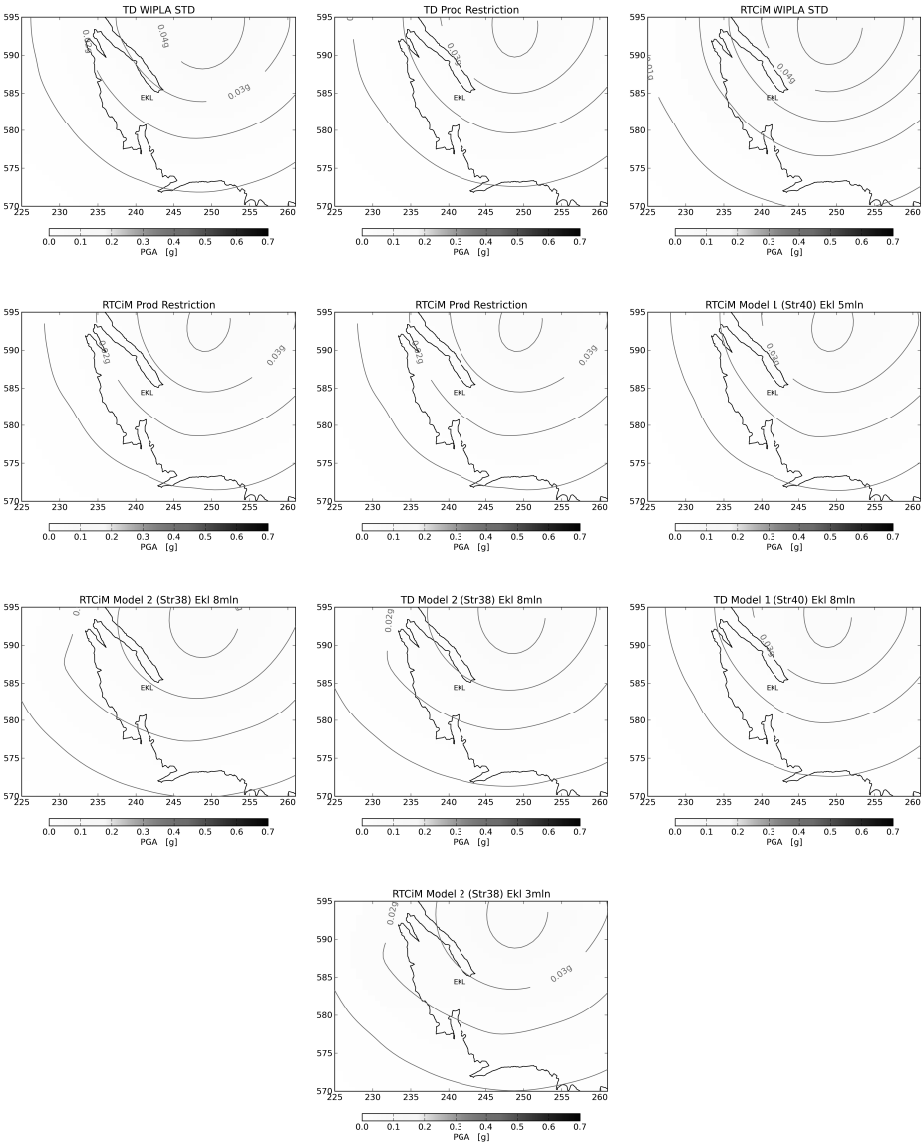


Figure 3: As Figure 1, except for a 10% average annual chance of exceedance. The contour interval is 0.01g.

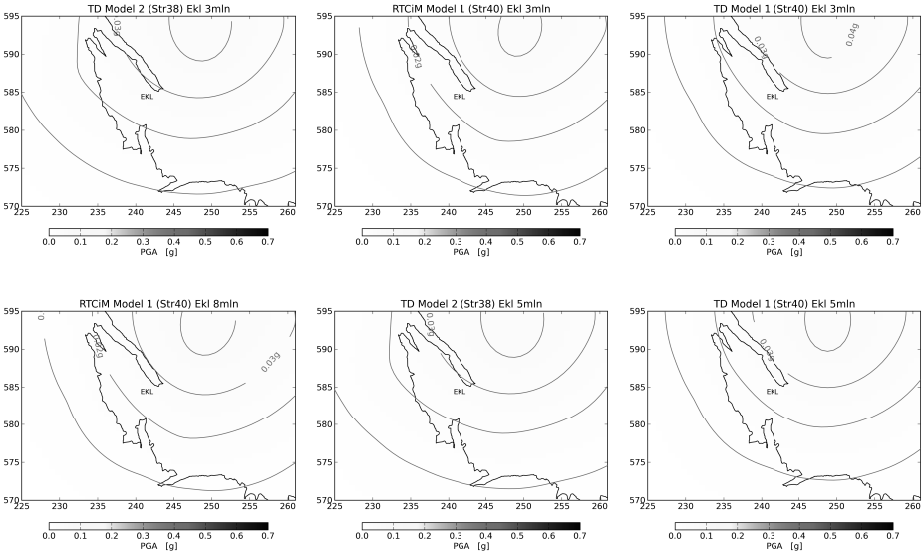


Figure 3 continued.

## Strain Partitioning Model of Seismicity

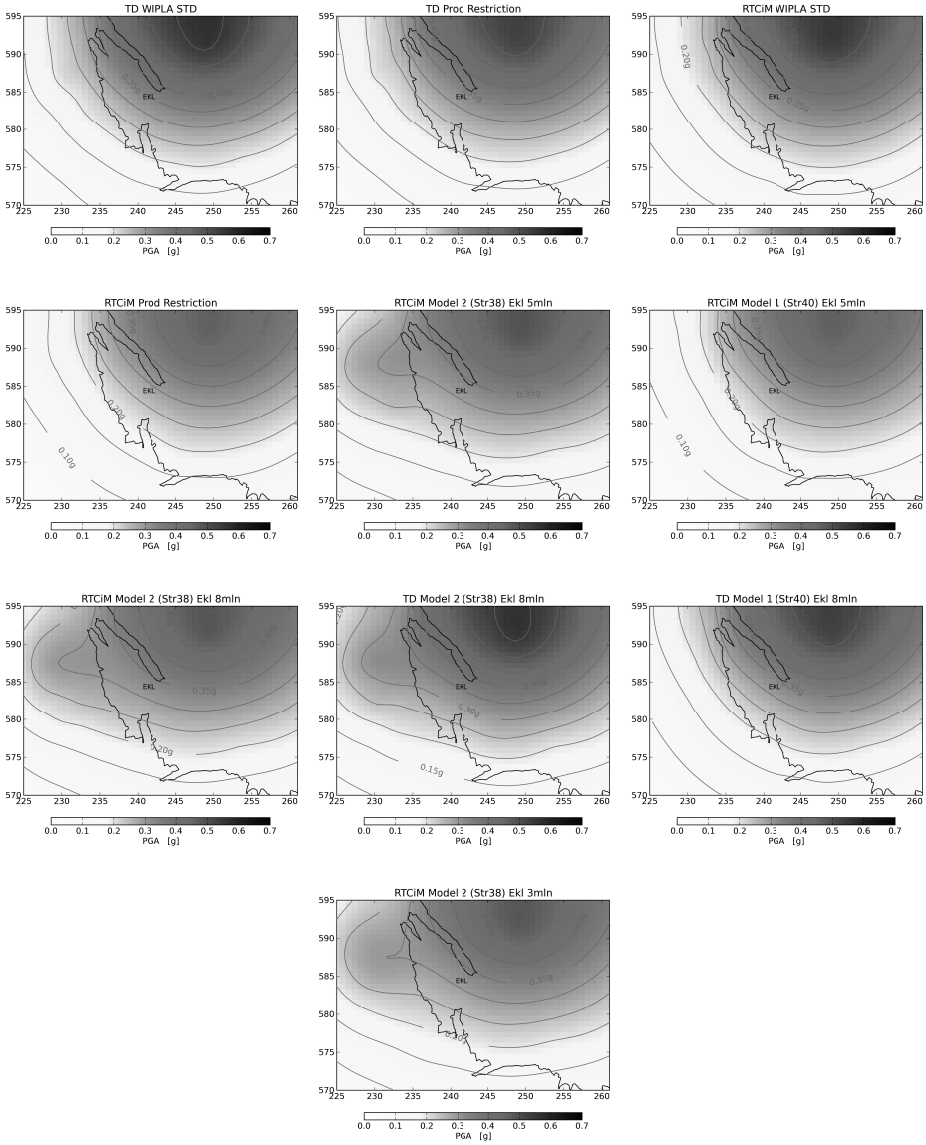


Figure 4: As Figure 1, except for the Strain Partitioning seismological model. The contour interval is 0.05g.

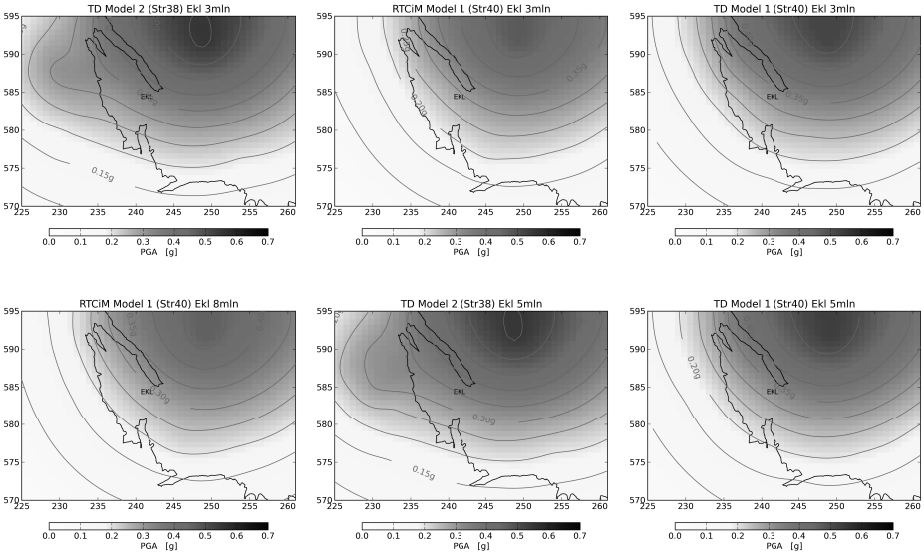


Figure 4 continued.

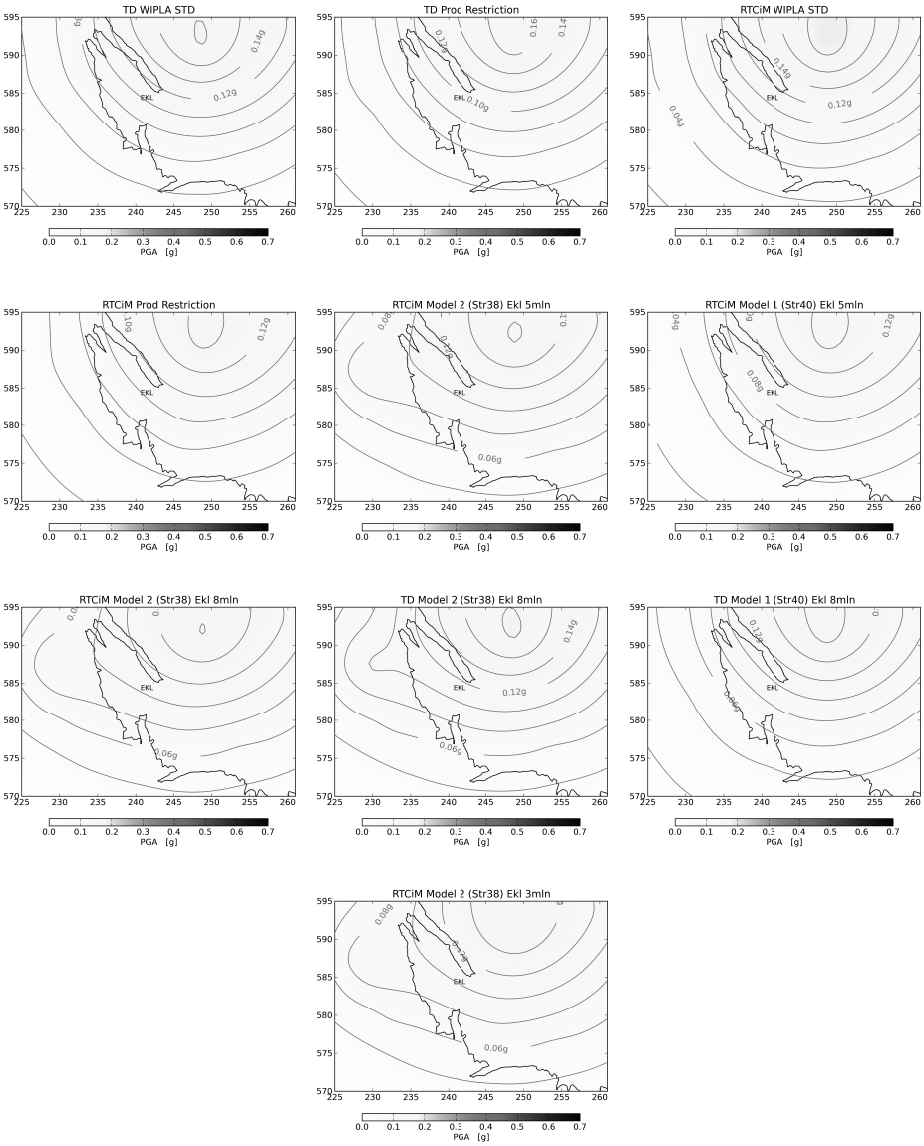


Figure 5: As Figure 4, except for a 2% average annual chance of exceedance. The contour interval is 0.02g.