

**GeoHazard Tool Requirement**

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Test Plan Revision Summary & Reference

Department: Model Certification

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Responsible Parties:

|  |  |  |
| --- | --- | --- |
| Activity | Person(s) involved | Status |
| Write-up | Ching-Yee Chang | Ongoing |
| Review | Mohammad Razavi , Srinivas Thupakula, Nervdeshwar Pandey | TDB |

Revision History:

|  |  |  |
| --- | --- | --- |
| **Testplan Version** | **Date** | **Summary of Changes** |
| 0.1 | 06/29/2016 | Initial version |
|  |  |  |

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# Stored data

## 1.1 List of tables

All the tables in GeoHazard DB has naming format as eqxxssss

Where xx is the country code in little case; and ssss is the table suffix

For NAEQ, there are 3 countries: ca (Canada), mx (Mexico), and us (U.S.).

Not all the countries have the same table lists

Below is a list of all the possible tables and if a country contains that table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | Countries | | |
| CA | MX | US |
| TableName\_suffix | Comments |  |  |  |
| cr | Cresta resolution |  |  |  |
| ct | City resolution |  |  |  |
| cy | County resolution | N.A. | Municipalidad (municipality) |  |
| dt | District resolution | N.A. | Colonia (Colony) | N.A. |
| lc | LocationCode |  | N.A. | N.A. |
| pc | PostalCode resolution | N.A. |  |  |
| st | State resolution |  |  |  |
| vrg\_geoid |  |  |  |  |
| vrgfire | VRG resolution fire |  | N.A. |  |
| vrgland |  |  |  |  |
| vrgsec |  |  |  |  |
| vrgsec |  |  |  |  |
| vrgsoil |  |  |  |  |
| vrgsoilperiod |  |  |  |  |
|  |  |  |  |  |

# Test cases

* 1. **Tests for overview**
     1. Check number of countries, total number of tables, recognize table that should not be in the geoHazard DB and report these numbers and/or tables.
     2. Check if all tables are indexed.
     3. Report the number of empty tables.
     4. For each country, all tables contain GEOID column (Except vrg\_geoid tables)
     5. Find all the unique tables, identify which country has which tables missing

* 1. **Tests for VRG tables**
     1. For each country, check that all vrg tables have the same number of unique GEOIDs (except vrgfire)
     2. For each country, compare the values in column haz in eqxxvrgsoil table with interpolated soil haz value from column soilvs in eqxxvrgsoilperiod table.  
        Currently, the benchmark values for interpolation is   
        VSbreaks = (3000, 1800, 1100, 760, 560, 413, 270, 180, 120, 80)  
        SoilIndex = (0.001, 0.5, 1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5)  
        The methodology is to get the interpolated soil value by projecting the soilvs value onto VSbreaks and by linear interpolation to get the soil value in the range between 0 and 4.5.  
        Report the number of records whose percent error is bigger than 1%.
     3. In vrgsoil table, range of values in column haz should be   
         0 <= haz <= 4.5
     4. In vrgsoilperiod table, range of values in column soilvs should be   
        0 <= soilvs <= 3000
     5. (not done yet.) Count 10k Geoids in VRG tables. Number shouldn’t look small. Report the numbers.
  2. **Tests for Non-VRG tables**
     1. For non-VRG tables, compare the values in soil column with the interpolated values from soilvs column.   
        Same methodology as described in test case 2.6
     2. Range of values in column soil should be: 0 <= soil <= 4.5
     3. Range of values in column soilvs should be: 0 <= soilvs <= 3000
     4. (Not done yet) All non VRG tables should have StateCodes in US (Not done yet)
     5. (Not done yet) Check for GDMID column presence in PC/CT/ST/CY tables (in GeoHaz DB)
     6. (Not done yet) Point postcodes should receive Geotech values from the parent postcode
     7. (Not done yet) Merge Liq and Land tables. No land where liq and vice versa.
     8. (Not done yet) No liq on rock (by soiltype) etc. (Megan Arnold, for RL9.0)
  3. **Cross check between GeoHazard DB and Vuln.vgeo** 
     1. Cross check the consistency between GEOIDs of different geo-resolution in GeoHazard with the corresponding GEOIDs in vgeo table.

In general, the corresponding GEOIDs in these two sets of DBs are

|  |  |  |
| --- | --- | --- |
| **Vgeo table column name** | eqvgeoXX table column name | GeoHazard table name |
| Admin1Code | STATE | ST (State) |
| Admin2Code | DSTRCTCODE | DT (District) |
| Admin3Code | COUNTYNUM | CY (County) |
| Zone1 | CRESTA | CR (Cresta) |
| PostalCode | POSTALCODE | PostalCode |
| CITYCODE (or CITY?) | CITY | CT (City) |

As of July 5th 2016, the code is implemented with the most inclusive rule for cross checking the consistency of the GEOIDs. However, in general, some countries may not have all the geo-resolutions.

* 1. **Expected Columns Tests**
     1. Compare all columns GeoHaz DB with the Expected Columns from data folder.
  2. **Column Ranges Tests**
     1. Check column ranges for Landslide Columns: currently check these columns with their ranges in brackets:  
        SoilPeriod: [1.3,20, 0],  
        PHI: [10,60],   
        COHES: [10,60],   
        ELEV: [0,5000],   
        SLOPE: [0,89],  
        ROUGH: [0,5],  
        TOPO: [-1000,1000],  
        NDVI: [-1,1],   
        PRECIP: [0,10]
     2. Check column ranges for liquefaction Columns: currently check these columns with their ranges in brackets:  
        DI: [0,100]
  3. **Null Values Tests** 
     1. Check if NULL record exist in any table/column
  4. **GeoHaz vs NGGeography Cross-Check Tests:** Check various GEOIDs consistency across Geohazard and NGGeography
     1. Check for consistent GDMID/CODE in non-VRG tables
     2. Check for consistence of StateCode in non-VRG tables.
  5. **vrg\_geoid table completeness Test**
     1. Check if corresponding tables of the VRG hazards in the vrg\_geoid table all exist
     2. Check if there are number of records in the vrg hazard tables are consistent across different vrg-hazards. (currently, only check for non-fire vrg-hazard. The method used is short-cut, and only works for NG-type models).
  6. **vrg tables Column values test**
     1. Checking eqCCvrg tables for certain columns’ values that should not exist:
     2. [eqCCvrgsec] GWD = 0 should not exist (if present be changed to GWD = 0.1)
     3. [eqCCvrgland] HAZ = 0 should not exist
     4. [eqCCvrgsoil] HAZ = 0 should not exist
     5. [eqCCvrgliq] HAZ = 0 should not exist
     6. [eqCCvrgsoilperiod] SOILVS = 0 should not exist
     7. Report the number of records in [eqCCvrgsoilperiod] where soilvs >= 1000 and soilperiod > 0
     8. Report the number of records in [eqCCvrgsoilperiod] where soilperiod > 0 and basinid = 0
     9. (ToDo) Report the number of records in [eqCCpc] where soilvs >= 1000 and soilperiod > 0
     10. (ToDo)Report the number of records in [eqCCpc] where soilperiod > 0 and basinid = 0

# Tool requirements

* 1. **User inputs for hazcache.sdf in the config file**
  2. **Option to generate the csvs or not**