ShakeCast Documentation 3.0

Customization

Summary: Tags provide another means of navigation for your content. Unlike the table of contents, tags can show the content in a variety of arrangements and groupings. Implementing tags in this Jekyll theme is somewhat of a manual process.

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ShakeCast delivers post-earthquake and inspection prioritization information to users in several different formats, including:

- Email notifications

- ShakeCast Summary Report

- ShakeCast XML, GoogleEarth KML files and Excel spreadsheets (ShakeCast Local Products)

In addition, ShakeCast users can interact with the system to retrieve detailed results of the analysis, including:

- ShakeCast Website

- ShakeCast Application Programming Interface (API)

In this section we describe the default templates, products, and the ShakeCast web interface. We also show the procedure to customize the above contents to improve user experience. Refer the ShakeCast Technical Guide for detailed description on the ShakeCast local product and API.

ShakeCast Email Notifications

Email is the primary delivery method of ShakeCast notifications following an earthquake. For most users, email notifications provide a sufficient amount of detail about the event, the impact on facilities and may be the only ShakeCast product used.

ShakeCast is pre-configured to send four types of emails: NEW EVENT, UPDATED EVENT, CANCELED EVENT, and FACILITY ASSESSMENT. The type of message is in the subject line.

ShakeCast notifications are template-driven to meet users' specific requirements and the Administrator can modify the default template and to create new ones for specific user groups. Notifications are generated in real time and their appearance may vary with different email clients, so should be thoroughly tested.

To address access problems from outside the organization's network, earthquake products and images stored on the internal server can be included as attachments to email notifications. The administrator does this by editing the notification templates. Any file available on the local ShakeCast server can be attached to a notification, but the administrator needs to consider the overall size of email notifications on performance.

ShakeCast typically generates email notifications within one or two minutes from receipt of ShakeMap data from the USGS and ShakeMap data is typically generated within 5 minutes of the event. There have been events over the course of the project where longer ShakeMap generation times were observed, which results in longer times for users to receive ShakeCast email notifications.

Default Facility Assessment Message

The ShakeCast system is triggered when an earthquake with a magnitude of 3.0 or greater is reported by the USGS. Inspection Priority emails are sent if the estimated peak ground motion (PGM) is greater than the triggering threshold. This email includes the list of facilities of specified type and their Inspection Priority.

Facility assessment messages contain the following key features:

- A summary of the event with date, time, magnitude, epicenter and location.

- Key shaking metrics for the ShakeMap.

- A graphic image of the ShakeMap showing the extent of strong shaking.

- The complete list of facilities analyzed and their relative Inspection Priority.

- An optional attachment of ShakeCast Report in PDF (depending on availability at the time of notification) showing detailed information.
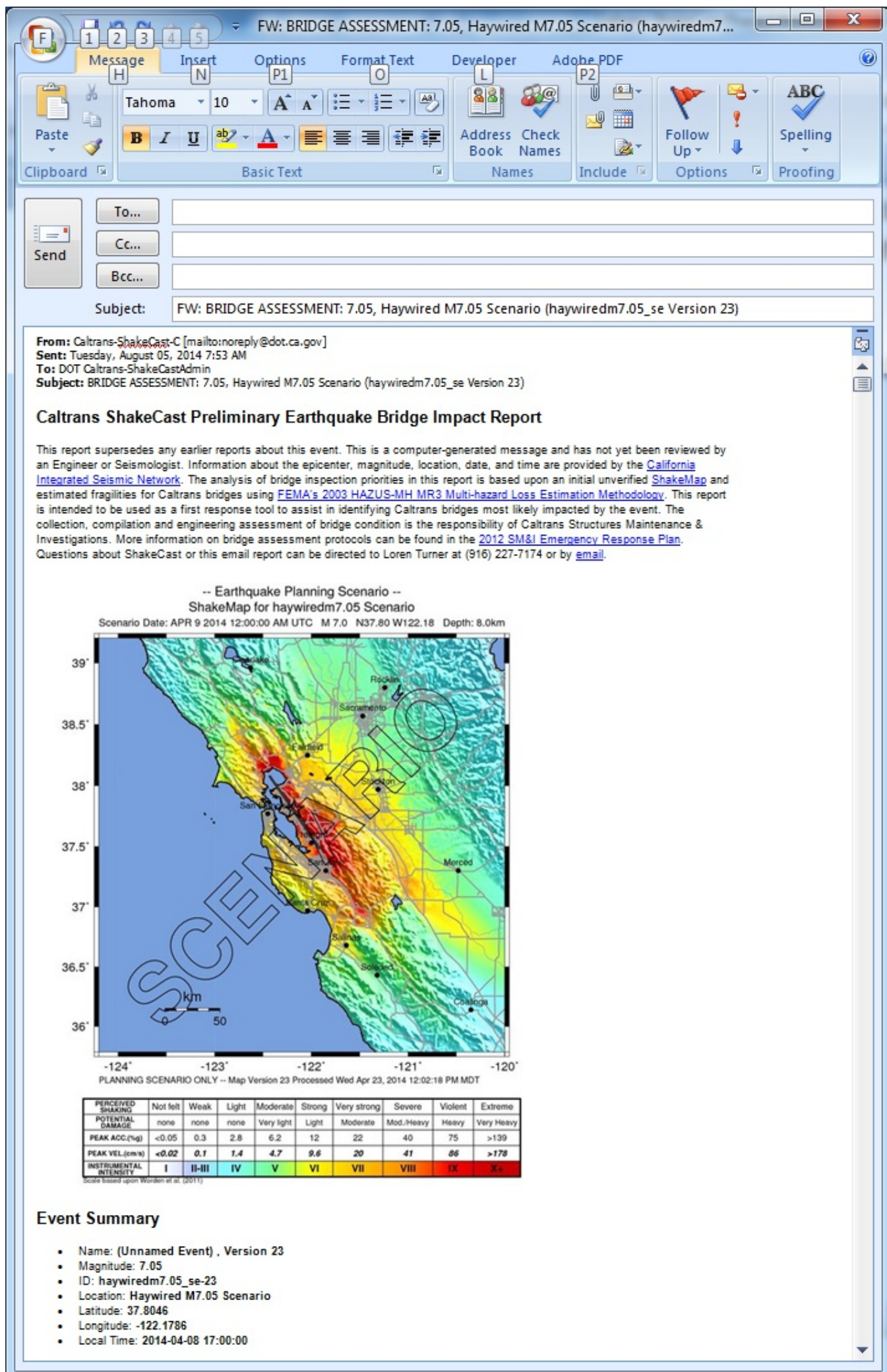
Figure 1. ShakeCast Facility Assessment message and contents.

Notification Template

All ShakeCast notifications and products are template-driven to meet users' specific requirements. The default template for facility assessment message shown in the figure above is described in details in this section. The administrator can modify the default template and/or create new templates for specific user groups.

Template Directory

ShakeCast is pre-configured to send four types of emails: NEW EVENT, UPDATED EVENT, CANCELED EVENT, and FACILITY ASSESSMENT. The type of message is in the subject line.

ShakeCast notifications are template-driven to meet users' specific requirements and the Administrator can modify the default template and to create new ones for specific user groups. Notifications are generated in real time and their appearance may vary with different email clients, so should be thoroughly tested.

The template directory path is a directive in the system configuration file, sc.conf, e.g.,

TemplateDir C:/Shakecast/sc/templates

Email notification templates are organized by notification type, then the message type in the template directory.

TemplateDir > Notification Type Directory > Message Type Directory

Valid notification types and their triggers are:

- **New Event** (new_event): a new earthquake is declared

- **Updated Event** (upd_event): an earthquake's source parameters change

- **Canceled Event** (can_event): an earthquake is canceled

- **Facility Assessment** (damage): fragility assessed at a facility for an event's ground motion measurements

- **New Product** (new_prod): a new registered earthquake product becomes available

- **Facility Shaken** (shaking): ground shaking estimates are available at a single facility

- **System** (system): the system's encountered an error during execution

Customizing Email Notifications

The notification template consists of either one or multiple files, depending the message aggregation option.

- If the aggregation flag is not set in the notification request, a single template file is used.

- If the aggregate flag is set, the template file is divided into header, body and footer segment files. Among the three files, the body segment aggregates notifications (event, product, shaking, damage, and system) into a table and the table is sorted based on directives in a separate configuration file.

The filename "default" is used when no custom notification template is requested e.g., for a non-aggregated template (damage notification) the content of the template shown below will be saved into a single file, *default.txt*. The aggregated template consists of three template segments, *default_header.txt*, *default_body.txt*, and *default_footer.txt*

```
; Default HTML Email Notification -- header
;
From: ShakeCast < **%HEADER\_FROM%** >
To: **%HEADER\_TO%**
Subject: Inspection Priority M **%MAGNITUDE%** - **%EVENT\_LOCATION\_DESCRIPTION%** (
 **%EVENT\_ID%** )
Attach: C:/ShakeCast/sc/data/ **%SHAKEMAP\_ID%** - **%SHAKEMAP\_VERSION%** /intensity
.jpg
; End -- header

<font size=+2><b>ShakeCast Event: Magnitude **%MAGNITUDE%** </b></font><br>
ShakeMap **%EVENT\_NAME:|NULL|;(Unnamed Event)%** Version **%SHAKEMAP\_VERSION%** <br
>
Event Location: **%EVENT\_LOCATION\_DESCRIPTION%** <br>
Event Time: **%EVENT\_TIMESTAMP%** <br>
Generated at **%GENERATION\_TIMESTAMP%** <br>
Reported by: Server ID = **%SERVER\_ID%** , DNS = **%DNS\_ADDRESS%**
<p>

<font size=+2><b>Damage Summary</b></font><br>
Number of Facilities Reported: **%\_ITEMNO%** <br>
Max Value: MMI: **%\_MAX\_METRIC\_MMI%** ;
Acceleration: **%\_MAX\_METRIC\_PGA:|NULL|;(not measured)%**<br>
Number of Reports of Likely Damage: **%\_NUM\_DAMAGE\_LEVEL\_RED%** <br>
Number of Reports of Possible Damage: **%\_NUM\_DAMAGE\_LEVEL\_YELLOW%**

<p>

<font size=+2><b>Facility Damage Estimates from ShakeMap</b></font>
<img src="_cid:intensity.jpg_">
<table border=1 bordercolor=black cellpadding=5 cellspacing=0>
<tr>
  <th>Facility
  <th>Inspection Priority
  <th>Metric
  <th>Value
  <th>Exceedance Ratio
</tr>

;;;;;
```

```
; Default HTML Email Notification -- body
;

<tr>
<td> **%FACILITY\_NAME%**
<td bgcolor= **%DAMAGE\_LEVEL:RED;RED;YELLOW;YELLOW;ORANGE;ORANGE;GREEN;GREEN%** > **
%DAMAGE\_LEVEL:RED;High;ORANGE;Moderate High;YELLOW;Moderate;GREEN;Low%**
<td> **%METRIC%**
<td> **%GRID\_VALUE%**
<td> **%EXCEEDANCE\_RATIO%**
</tr>
```

```
; Default HTML Email Notification -- footer
;
</table>
[END]
```

Sorting in the body template segment below is done in the file, *default.conf*.

```
;
;;; config for email html
;
sort severity\_rank/d grid\_value/d exceedence\_ratio/d facility\_name/t
;
;;;
```

Template Layout and Content

ShakeCast users receive email notifications based on the design of layout and content for the template rendered in real time. Design of an HTML-based template is similar to a web page and usually requires iterations to get the expected user experience. The result may also vary depending on user's email client.

Attachments : If an organization has security or firewall issues for users outside of their network, an administrator can include one or more earthquake products as email attachments. Any file available on the local ShakeCast server can be included in the notification's header, but the administrator should balance the size of the email notifications with performance goals. Email notification attachment is a new feature of the V3 system and is done with a header directive e.g.,

```
Attach: C:/ShakeCast/sc/data/%SHAKEMAP\_ID%-%SHAKEMAP\_VERSION%/intensity.jpg
```

Keywords : Keywords enclosed by the "%" symbol in are replaced with their corresponding values stored in the ShakeCast database.

- The scope of keywords varies for the intended notification type. Appendix I lists available keywords for all notification types.

- Keywords for derived values (specific to individual notification message) are prepended with an underscore symbol "_", e.g., **_MAX_METRIC_MMI**.

- Template-specific value mapping for keywords are separated by the symbol ";", e.g.,

```
**%DAMAGE\_LEVEL:RED;High;ORANGE;Moderate High;YELLOW;Moderate;GREEN;Low%**
```

maps RED to High, ORANGE to Moderate High, YELLOW to Moderate, and GREEN to Low in the facility damage assessment table.
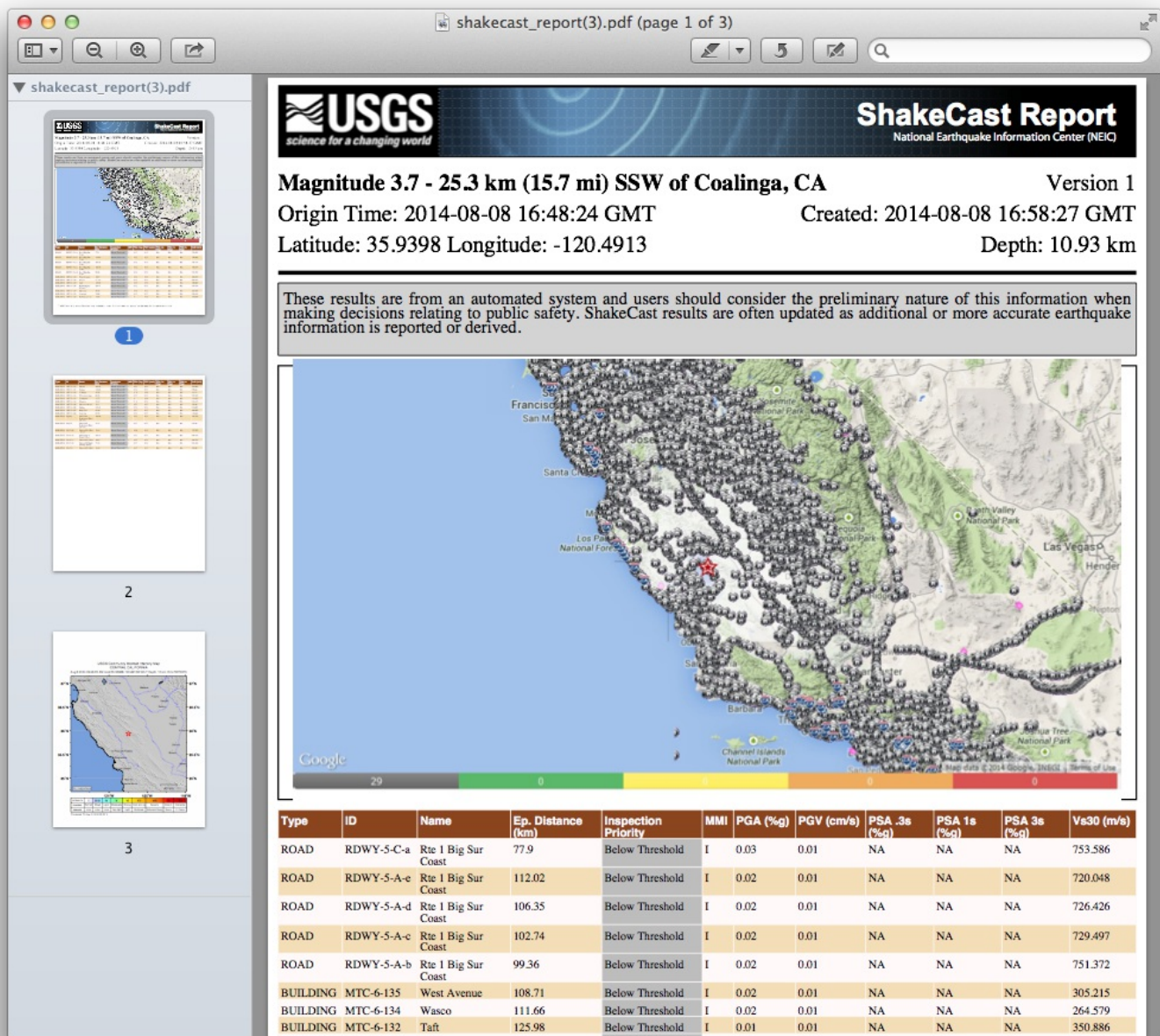
ShakeCast PDF Summary Report

The ShakeCast V3 system includes a PDF engine that generates formatted summary reports as standalone products or the PDF report can be sent directly to users as attachments to email notifications. The default PDF report consists of one ShakeCast summary page. The administrator can customize the PDF report similar to customizing email notifications.

The ShakeCast summary report provides:

- A summary of basic earthquake parameters, including origin time, magnitude, hypocenter, and the name of the region where the earthquake took place.

- A map with an intensity overlay showing the extent of shaking, facilities (enlarged icon for facility with shaking estimates) and recent seismicity in the region.

- A bar at the bottom of the map showing color-coded Inspection Priority and the number of facilities in each level.

- A table showing detailed parameters for each assessed facility. The template-driven table fields include the name, epicentral distance, Inspection Priority, PGM measures, and estimated Vs30.

**Figure 2.** ShakeCast summary page from the PDF summary report.

PDF Summary Report Template

The template-driven ShakeCast PDF report works in the same fashion as email notifications. The administrator can modify the default template and create new ones for specific user groups.

PDF report templates are in the templates directory: e.g.,

C:/Shakecast/sc/templates/pdf/

The ShakeCast PDF report consists of a template file (shakecast_report.pdf) in PDF format and a configuration file (shakecast_report.conf) in XML format. The base PDF template contains static content in writable PDF format. The administrator can modify the template to reflect their organization's identity.
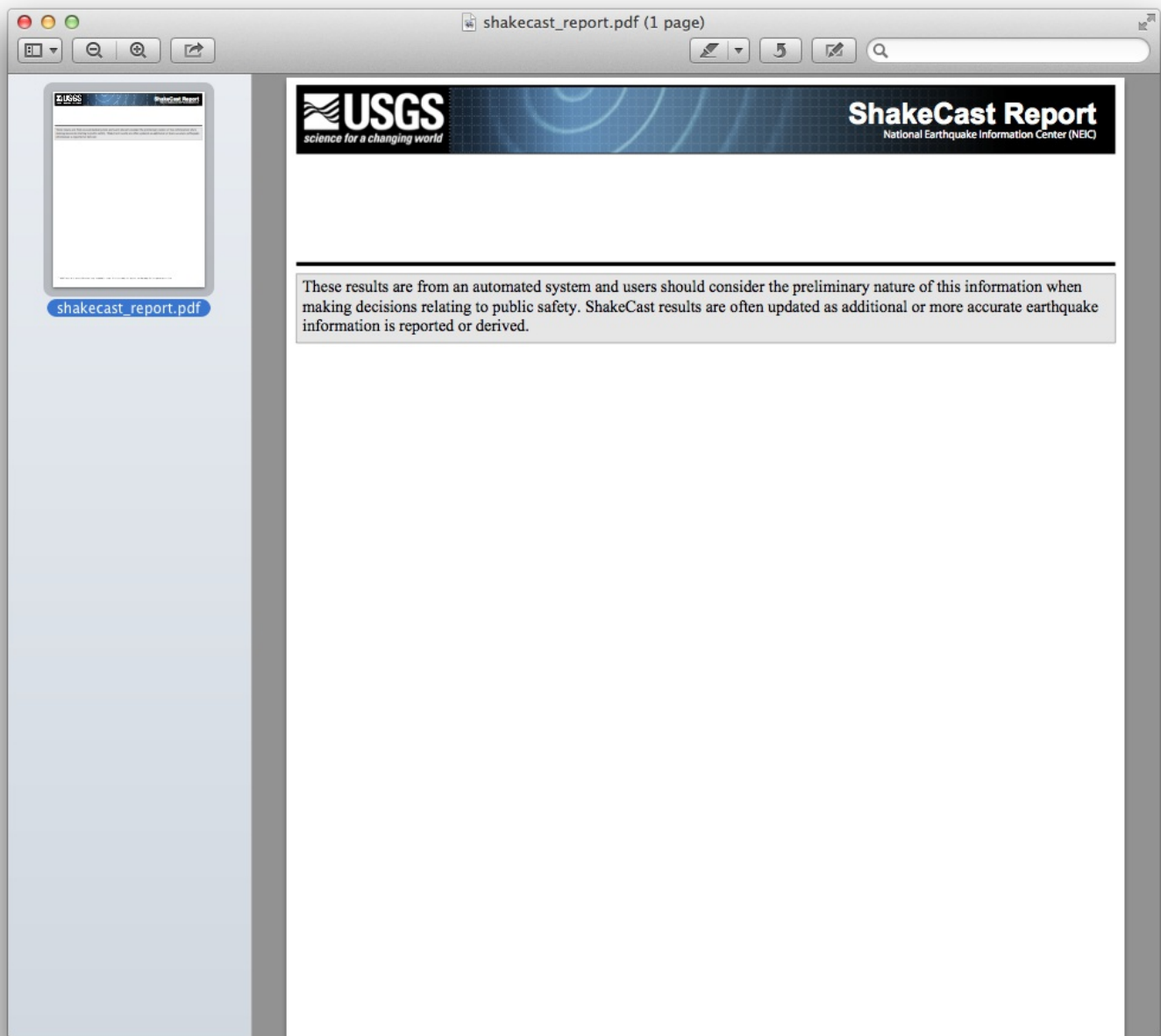
Figure 3. The default template in PDF for the summary report.

Template Layout and Content

The base PDF template above contains static content and is in writable PDF format. The included default template was created using the Adobe Illustrator program. The administrator can modify the template to reflect the identity of user's organization using a PDF editing program.

ShakeCast uses XML tags for common actions of creating PDF files. ShakeCast translates each XML tag in the PDF configuration file and creates one element in the output PDF in the following hierarchy:

< **template** > –> < **page** > –> < **block** > / < **text** > / < **image** > / < **table** >

- < **template** > declares a PDF template

- < **page** > inserts a new page in the PDF output file with an optional number attribute to specify the page number. The pdf attribute imports an external PDF document into the specified page. The page will be skipped if the requested PDF document is not available.

- < **block** > a general purpose container. It creates and inserts a vector image at the specified size

and location. tag can enclose all element types to create a complex element.

- < **text** > inserts a string of text into the specified location and bounding box. Line breaks will be inserted and font size will be adjusted automatically to contain the entire string.

- < **image** > inserts an external image in either jpeg, gif, or png format to the specified location and dimension. Note: the image may be distorted if the specified dimension is not proportional to the original image.

- < **table** > reads an existing table in csv format on the local system and creates a formatted table with the specified table fields. The table is inserted to the specified location of the page and the height of the table is determined by the number of entries to be included. New pages will be added to the output PDF file to include the entire table. The table is sorted by the inspection priority (color-coded) then epicentral distance.

Keywords enclosed by the "[]" bracket within XML tags are replaced with their corresponding values stored inside the ShakeCast database. The element location is in the Cartesian coordinate system with the bottom-left corner of the page as the origin.

[]:

Tags: getting_started (tag_getting_started)   troubleshooting (tag_troubleshooting)

shakecast_v3 (tag_shakecast_v3)