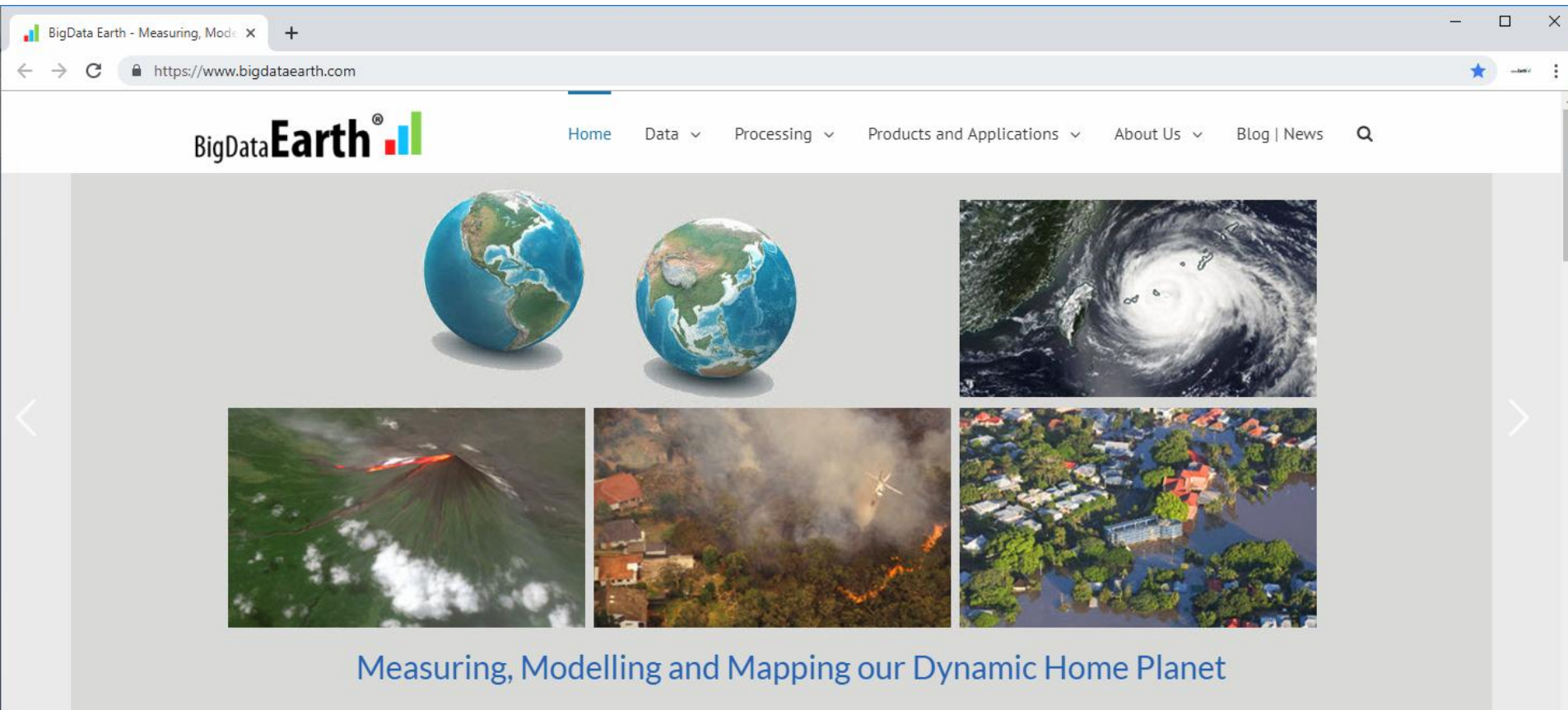


Introducing New R&D at BigData Earth



www.BigDataEarth.com
Sydney, Australia
08/2019

Website: <https://www.BigDataEarth.com/>



Welcome

BigData Earth is an R&D company creating innovative **Location-centric Business Applications** with Geospatial Big Data Analytics, Global Earth Observation and Cloud Computing. Its mission is to turn Big Data into **Smart Data** and **Location Insights** that are essential for informed decision making.

Blog: <https://www.BigDataEarth.com/blog/>

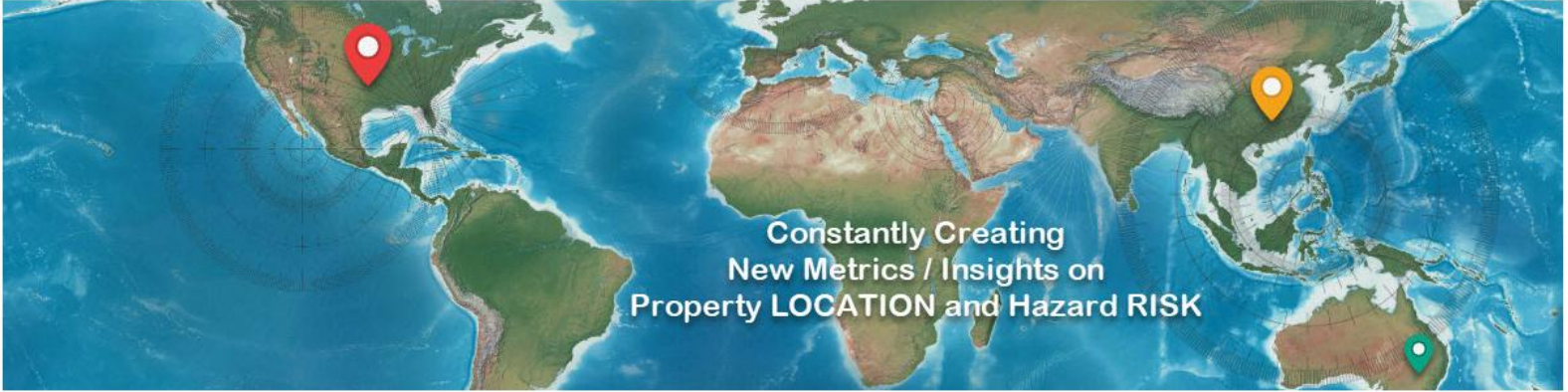
Blog - BigData Earth

← → ↺ 🔒 https://www.bigdataearth.com/blog/

☆

BigDataEarth®

Home Data ▾ Processing ▾ Products and Applications ▾ About Us ▾ Blog | News 🔍





Constantly Creating
New Metrics / Insights on
Property LOCATION and Hazard RISK

Blog

Home / Blog

18
06, 2019





Google

Applications of New National Contour Web Maps: Part 3 (Identifying Riverine Flood-prone Areas)

June 18th, 2019 | APIs, Apps, Australia, Emergency, Exposure, Flood, Geospatial Big Data Analytics, Insurance, Location Intelligence, Property Information, Risk

18 June 2019 We keep showcasing the potential application of new high-resolution contour web maps for Australia that have been recently developed (link). Previous blogs in this series include: Applications of New National Contour Web Maps: Part 2 (Identifying Low-lying Coastal Areas) - link Applications of New National Contour Web Maps: [...]

Search ... 🔍

Recent Posts

> Applications of New National Contour Web Maps: Part 3 (Identifying Riverine Flood-prone Areas)

> Applications of New National Contour Web Maps: Part 2 (Identifying Low-lying Coastal Areas)

> Applications of New National Contour Web Maps: Part 1 (Enhancing High-resolution Imagery Mapping)

BigDataEarth®



New R&D at BigData Earth

Main Applications: Property location information, emergency & insurance, the news media, etc.

Coverage: Australia, the U.S., China, etc.

- Building cloud-based big data and analytics platforms
- Developing web mapping, analysis and reporting Apps
- Creating address-level property location profile reports
- Developing unique hazard and exposure investigation tools
- Creating new software for Earth observation image processing
- Developing a suite of timely information products from Earth observation imagery to reports to animations in response to major events
 - Delivering products via web APIs and web services



Location Profile APIs on Property Location & Hazard Risk Intelligence



Emergency & Insurance: New Web Mapping, Analysis and Reporting App on Exposure Management



The Use of Geospatial Web Services & Web Maps to Advance Flood Risk Analytics in Australia



Advancing Bushfire Risk Analytics with Location Profile APIs and Web Services – 4 New Info Products




Advancing Flood Risk Analytics with Location Profile APIs and Web Services – 3 New Info Products





Advancing Cyclone Risk Analytics with Location Profile APIs and Web Services – 3 New Info Products




Major Products & Solutions

-  **Two cloud-based big data & analytics platforms on property location & hazard risk information**
 - **Australia** <https://www.PropertyLocation.com.au/>
(or www.RiskMapping.com.au)
 - **International** <https://www.PropertyLocation360.com/>
(or www.GeoRisk360.com)

-  **Web APIs on Location Profile & Hazard Risk Analytics**
 - Developer Portal: <https://Developer.BigDataEarth.com>

-  **Web App on Exposure Management**

-  **Web Maps on Terrain & Hydrology**



New Cloud-based Products Available



Web APIs on Location Profile & Hazard Risk Analytics

- General Location Profile APIs
- Bushfire Risk Analytics
- Flood Risk Analytics
- Tropical Cyclone Risk Analytics
- Exposure Analytics



Web App on Exposure Management

- Mapping
- Analysis (at both portfolio- and site-level)
- Reporting



Web Maps on Terrain & Hydrology

- High-resolution Elevation Contours
- Modelled Surface Water Flow Directions
- Shaded Relief Maps



1. Web APIs on Location Profile & Hazard Risk Analytics

Developed an integrated set of **location metrics** on property location, hazard risk & the environment, providing **measured contextual insights**.

Elevation profiles

3D perspective

Bushfire zones

Vegetation cover

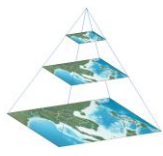
Climate-warming trend

Flood zones

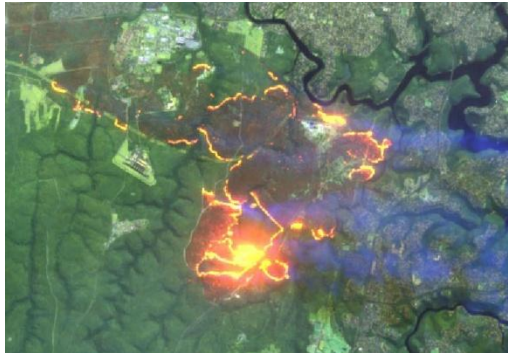
Water flow directions

Population, housing, etc. from census
("human terrain")



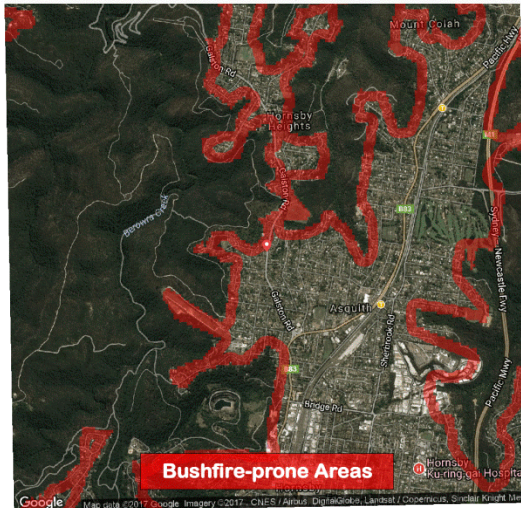


Advancing Site-level Bushfire Risk Analytics with Web APIs



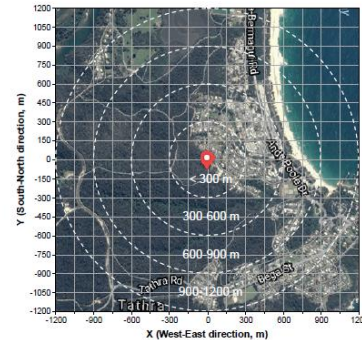
Distance Ranges from Nearby Bushland <100m

Shortest distance from address to bushland: 120m
Address: x Galston Rd, Hornsby NSW 2077, Australia

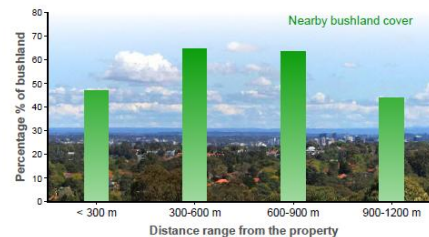


Vegetation data: Geoscience Australia | Analytics: PropertyLocation.com.au ©2017

Surrounding Bushland



The distance from this address to nearby large bushland is less than 100 m; bushfires occasionally take place in nearby bushland during the hot summer.



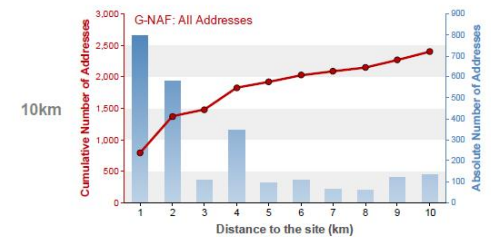
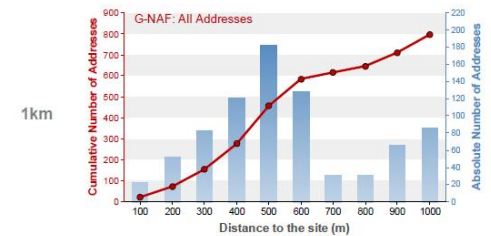
The percentage of bushland cover at various distance ranges from the property.

© 2018 www.RiskMapping.com.au

Page: 5

Estimating Exposure at Risk from Multiple Perspectives (Analysis based on 02/2018 Geocoded National Address File)

A1: All Addresses, All Directions



Distance (m)	100	200	300	400	500	600	700	800	900	1000
Absolute #	22	51	82	121	181	128	31	30	65	85
Cumulative #	22	73	155	276	457	585	616	646	711	796

Distance (km)	1	2	3	4	5	6	7	8	9	10
Absolute #	796	578	107	346	92	104	64	59	120	132
Cumulative #	796	1,374	1,481	1,827	1,919	2,023	2,087	2,146	2,266	2,398

© 2018 www.RiskMapping.com.au

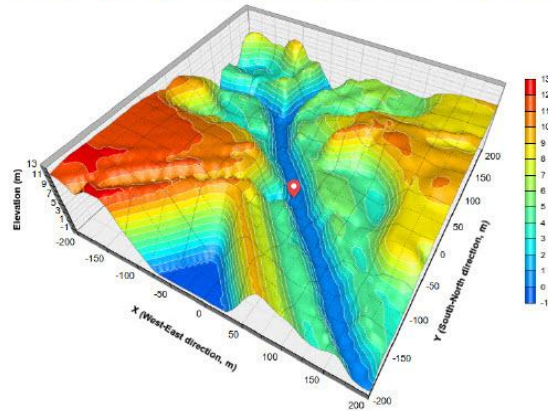
Page: 6

For locations in Australia and the state of California, the US. More info in this blog:
<https://www.bigdataearth.com/bushfire/advancing-bushfire-risk-analytics-location-profile-apis-showcases/>

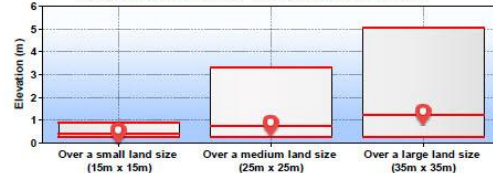


Advancing Site-level Flood Risk Analytics with Web APIs

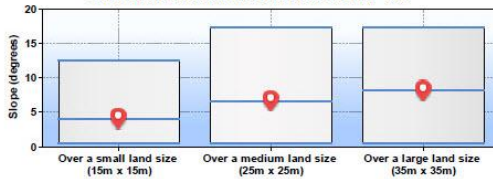
► Terrain: Average Elevation & Slope Over Various Land Sizes



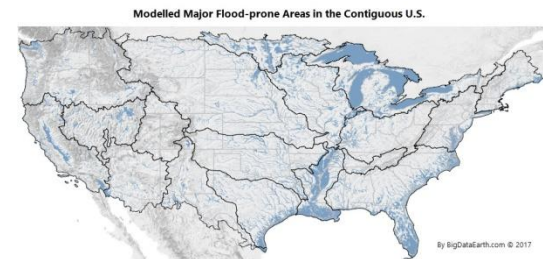
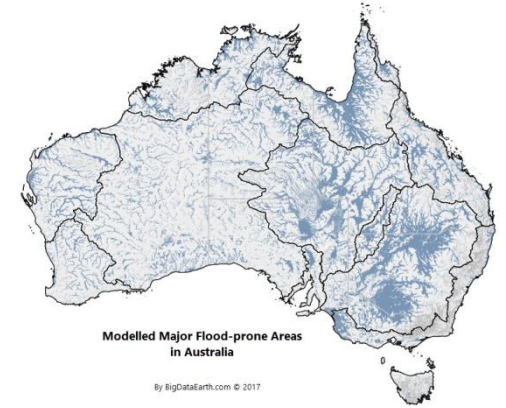
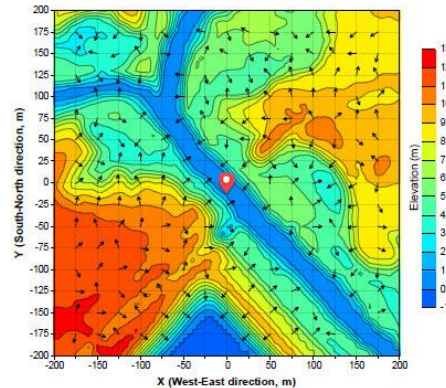
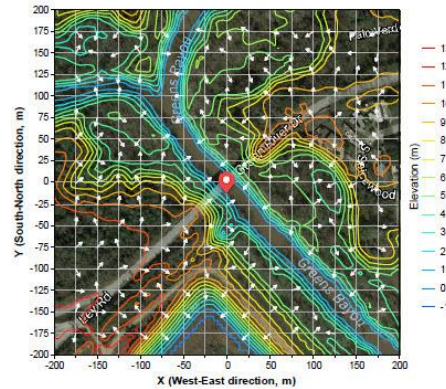
Elevation Variations: Max - Average (middle bar) - Min



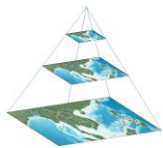
Slope Variations: Max - Average (middle bar) - Min



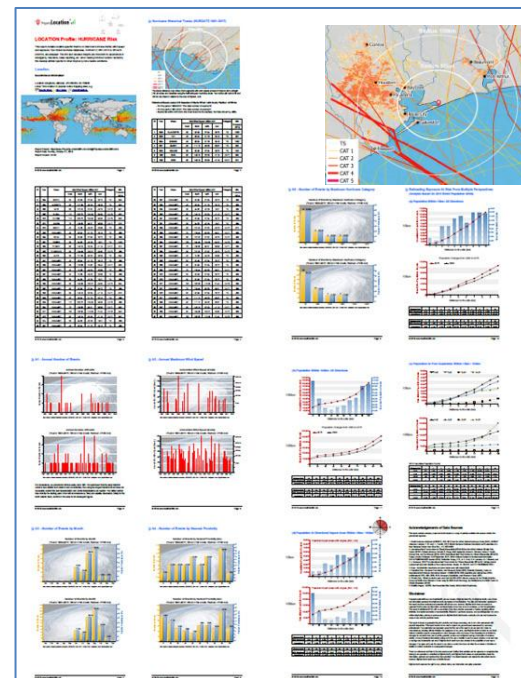
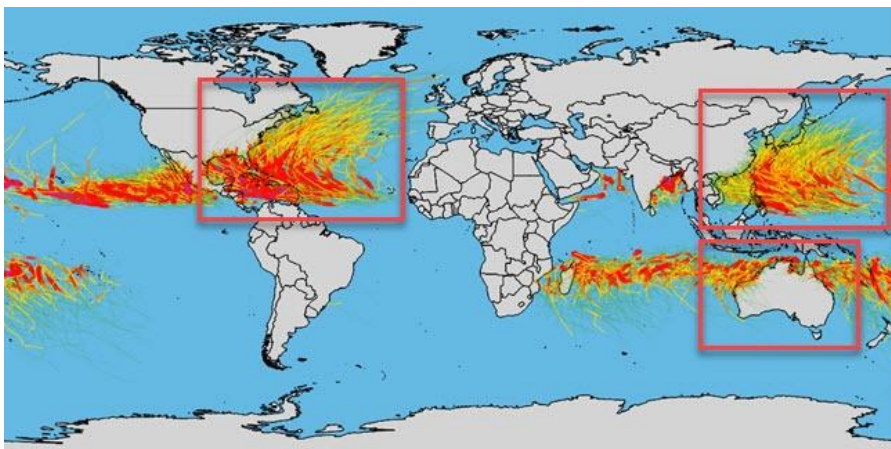
► Flood: Surface Water Flow Directions related to Flash, Riverine, or Coastal Flooding



For locations in Australia and the Contiguous US. More information in this blog:
<https://www.bigdataearth.com/flood/advancing-flood-risk-analytics-location-profile-apis-showcases/>



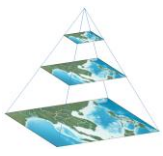
Advancing Tropical Cyclone Risk Analytics with Web APIs



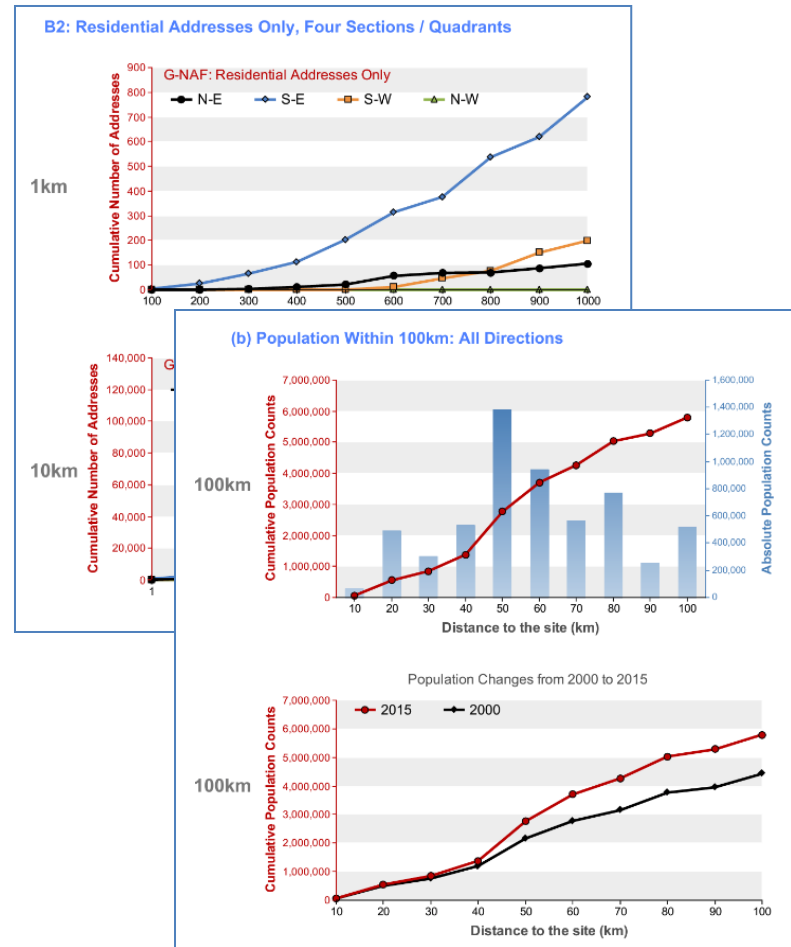
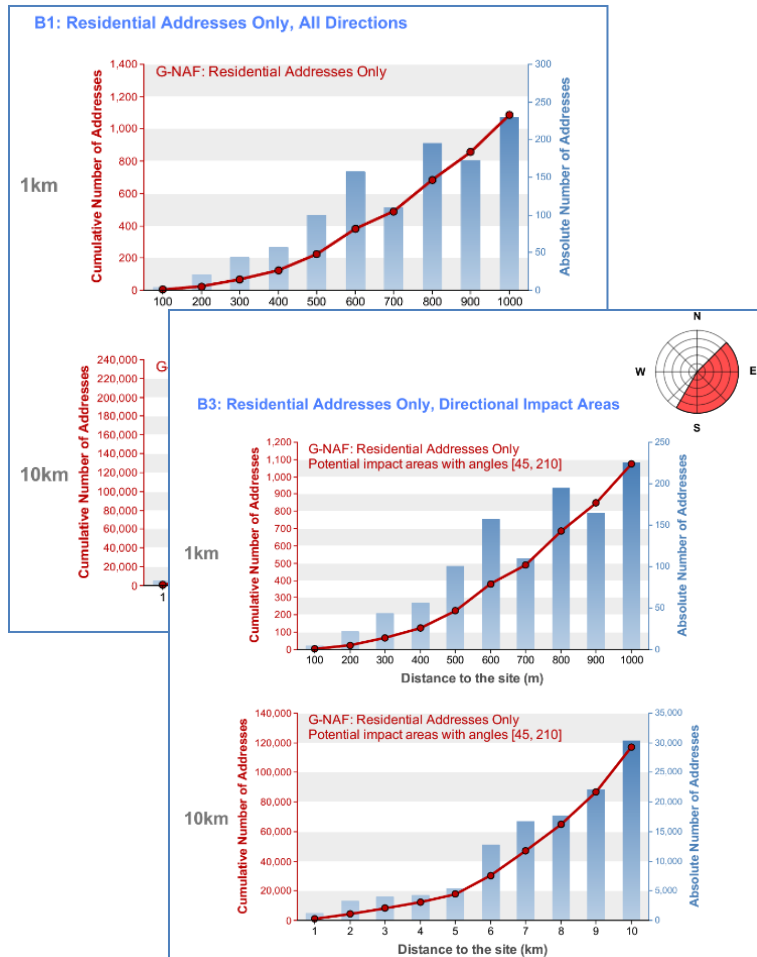
Two publicly-available tropical cyclone databases are analysed:

- The International Best Track Archive for Climate Stewardship (**IBTrACS v03r10**, released September 2017) from the NOAA National Climatic Data Center (NCDC)
- Atlantic hurricane database (**HURDAT2**, 1851-2017) from the NOAA National Hurricane Center (NHC)

Covering Australia, West Pacific & North Atlantic basins. More information in this blog :
<https://www.bigdataearth.com/hurricane/advancing-tropical-cyclone-risk-analytics-with-location-profile-apis-showcases/>



Rapid Exposure Analytics with Web APIs (For any type of exposure data, e.g. population, sum insured)



Four perspectives on spatial and temporal exposure analyses are presented.
More info in this blog:

<https://www.bigdataearth.com/exposure/innovative-exposure-analytics/>



Developer Portal for Location Profile APIs: <https://Developer.BigDataEarth.com>

The screenshot shows a web browser window with the address bar displaying <https://developer.bigdataearth.com>. The page has a dark header with the title "BigData Earth - Location Profile APIs" and navigation links: HOME, APIS, API PRODUCTS, and ISSUES. A "SIGN IN" button is on the right. Below the header is a large blue section with the heading "Welcome to the developer portal". The text in this section states: "Developers can discover and learn about BigData Earth's Location Profile APIs on **property location and hazard risk intelligence**. These application-oriented APIs are ideal for **Web & Mobile Apps development**. Sign up for an API key and start testing demo APIs right away." It then lists "Main features of the Location Profile APIs:" followed by four numbered points: (1) applications in property location information, emergency & insurance, the news media, etc.; (2) wide coverage including Australia, the U.S. and other regions; (3) integrated location metrics in accessible forms - map, chart, image, animation and PDF report; and (4) providing location analytics, contextual insights and flexible reporting at your fingertips. Below this is the text "Let our APIs enhance your business efficiency, agility and productivity!" and a green "Sign up" button. The bottom of the page is divided into two columns: "API Documentation" and "Developer Support". The "API Documentation" column contains text about API documentation and links to property location portals for Australia and the U.S. The "Developer Support" column contains text about visiting the BigData Earth website for more information and contacting developer@bigdataearth.com for subscriptions and technical support. In the bottom right corner, there is a "BigData Earth" logo with a stylized bar chart.

BigData Earth - Location Profile APIs

HOME APIS API PRODUCTS ISSUES SIGN IN

Welcome to the developer portal

Developers can discover and learn about BigData Earth's Location Profile APIs on **property location and hazard risk intelligence**. These application-oriented APIs are ideal for **Web & Mobile Apps development**. Sign up for an API key and start testing demo APIs right away.

Main features of the Location Profile APIs:

- (1) applications in property location information, emergency & insurance, the news media, etc.;
- (2) wide coverage including Australia, the U.S. and other regions;
- (3) integrated location metrics in accessible forms - map, chart, image, animation and PDF report; and
- (4) providing location analytics, contextual insights and flexible reporting at your fingertips.

Let our APIs enhance your business efficiency, agility and productivity!

[Sign up](#)

API Documentation

Check out the [API Documentation](#) that describes how to use the APIs and includes code samples in multiple languages. The API developer portal here allows you to directly test the APIs and request reports. Please sign in first.

For third-party independent uses of APIs with server-side secure implementation and client-side scripting, we provide many examples at two property location and hazard risk information portals:

- (1) <https://propertylocation.com.au/> (for Australia)
- (2) <https://propertylocation360.com/> (for the U.S. and other regions)

We are happy to provide any assistance if needed.

Developer Support

For more information about the Location Profile APIs, please visit [BigData Earth](#) website.

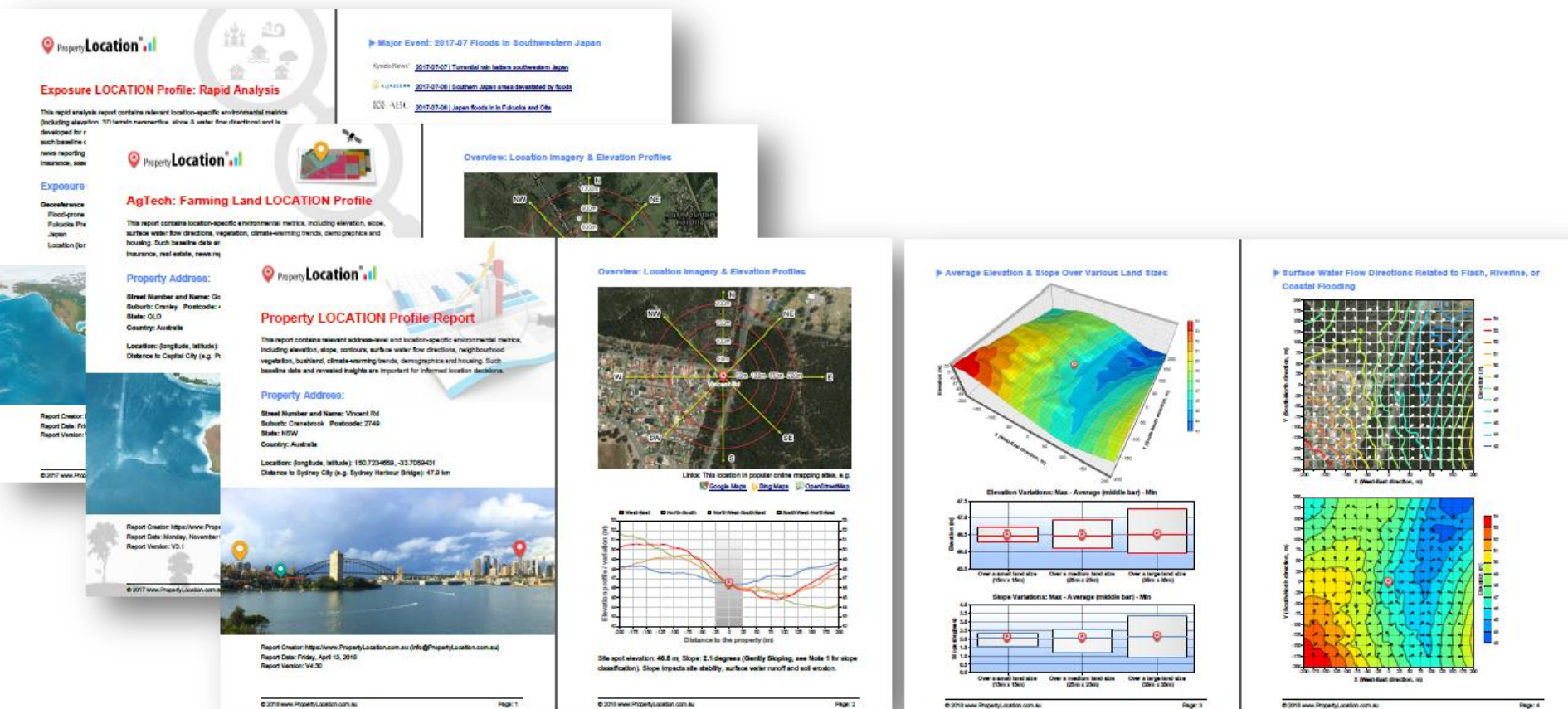
For subscriptions & technical support, as well as consulting services that turn your data into Web APIs, Web Apps and Web Services (along with the creation of standalone cloud-based big data & analytics platforms and white-label reporting), please stay in touch and send enquiries to developer@bigdataearth.com.

BigData Earth



Web APIs on Location Profile & Hazard Risk Analytics: Application 1

Various **Property / Exposure Location Profile Reports** for each location (PDF, up to 40+ pages) can be requested and delivered with simple API calls. Many sample reports are available: [Australia](#), [the US](#) and [worldwide](#) | demo [portal 1](#) and [portal 2](#)

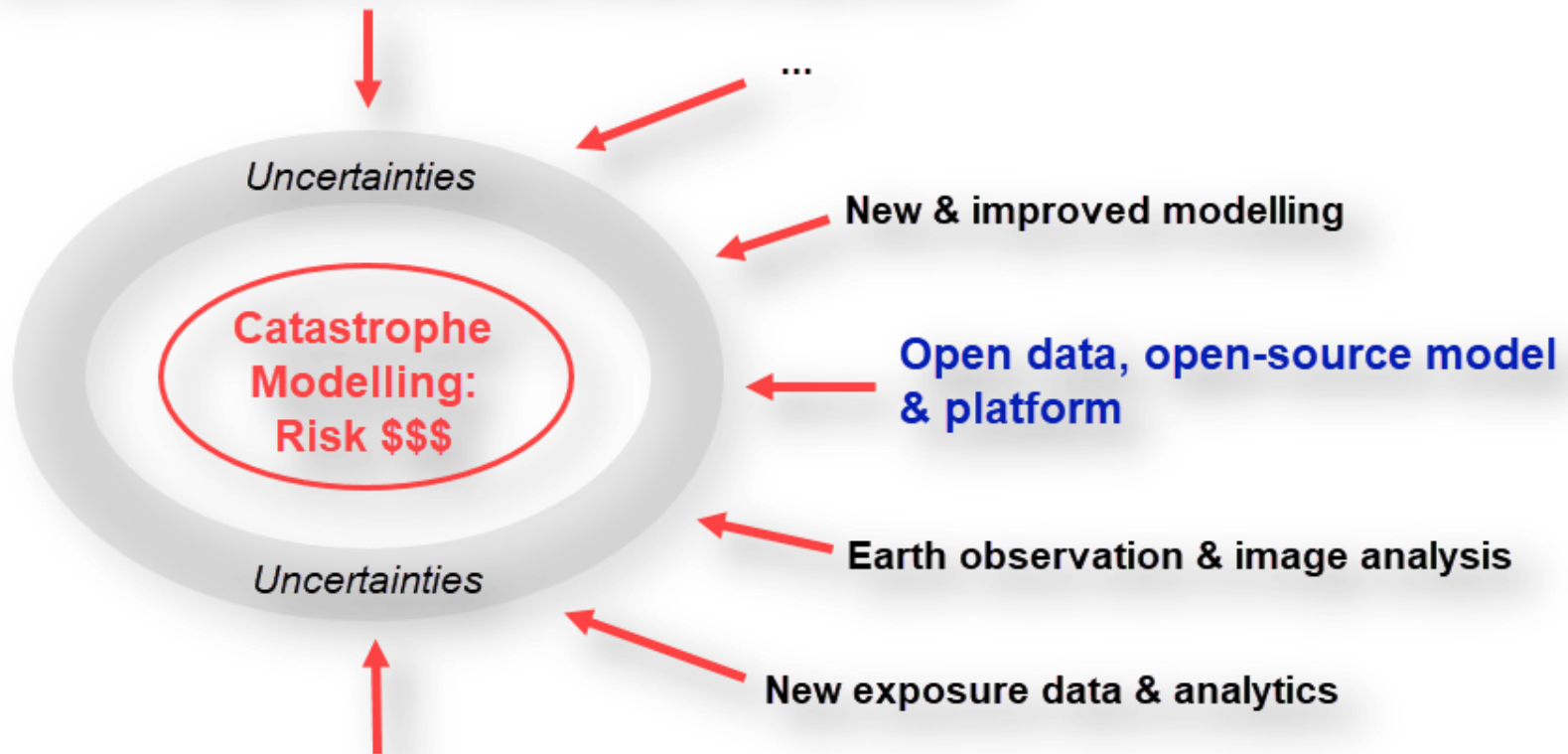




Web APIs on Location Profile & Hazard Risk Analytics: Application 2

A **bottom-up approach** to reducing uncertainties in catastrophe loss modelling: API-enabled report revealing underlying data, context & processes. More info in this [blog](#).

Top-down approach: Cross-model comparisons



Bottom-up approach: Site-level location profile report revealing underlying data, context & processes



2. Web App on Exposure Management

- Designed for rapid exposure analysis in **emergency & insurance**
- A national coverage, with all major perils considered
- Including 3 key functions altogether: **mapping, analysis & reporting**

The screenshot displays the PropertyLocation.com.au web application. The browser address bar shows the URL <https://www.propertylocation.com.au/georisk.php>. The page features a green header with the PropertyLocation logo and navigation links. The main content area is titled "Exposure Management: Location Profile & Risk Analytics" and includes a sidebar for "Hazard | Exposure Maps" with various layers like "AU Terrain and Hydrology", "Basemaps + Imagery", and "Hazard - Bushfire". The central map shows Australia with a red circle indicating a selected area. To the right, the "Exposure in Potential Impact Area" section displays statistics: "Total Number of Addresses:", "Estimated Population:", and "Exposure Estimation | Location Profile". Below this, there are input fields for "Shape" (circle), "Size" (199,129.633 km²), "Perimeter" (1,581.878 km), and "Radius" (251.764 km), along with a "Calculate Exposure" button. At the bottom, a "Reporting" section shows "Portfolio-Level Result 1", "Portfolio-Level Result 2", "Site-level Result 1", and "Site-level Result 2".

1 Mapping

2 Analysis

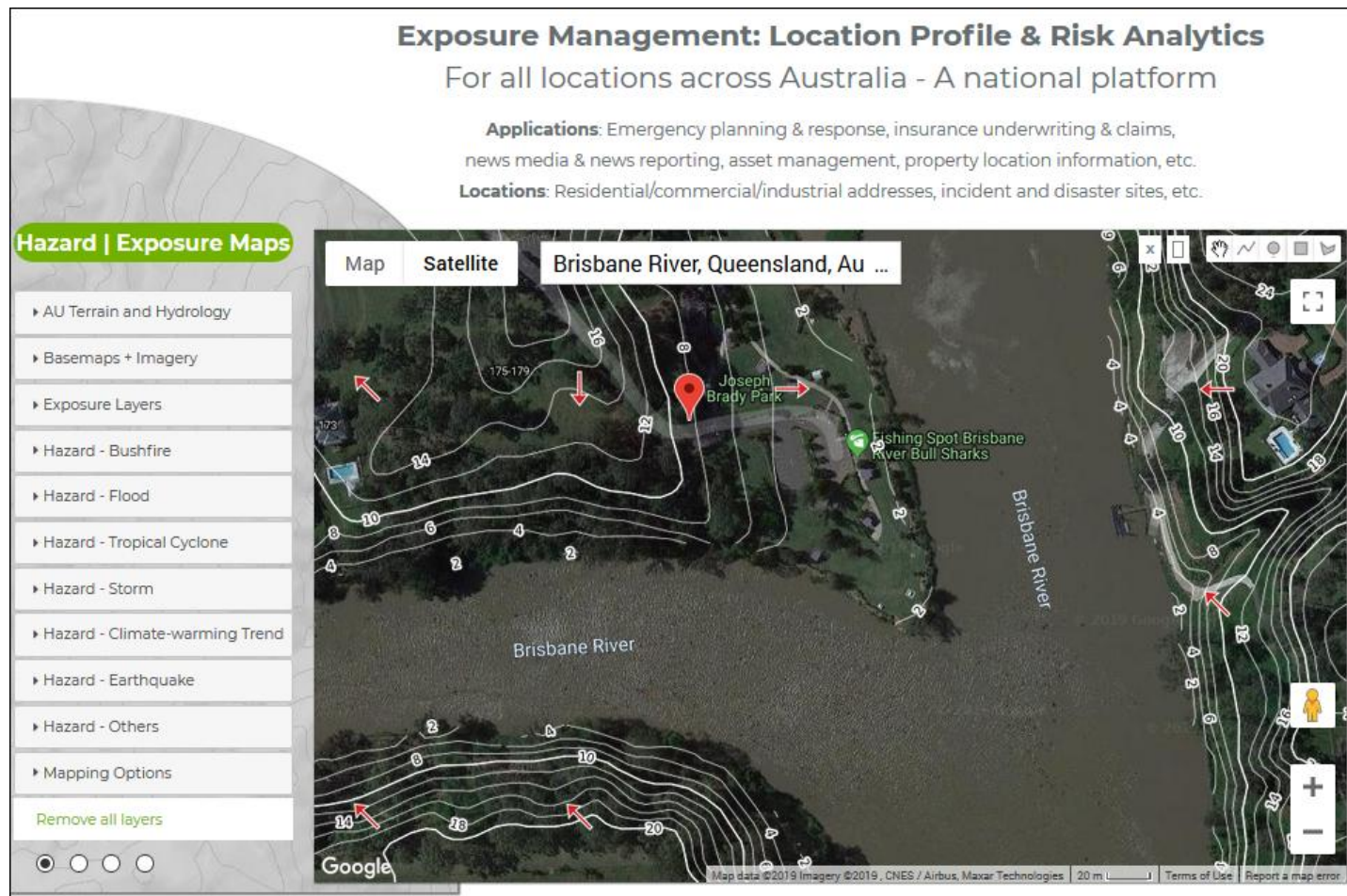
3 Reporting

Blog: <https://www.bigdataearth.com/apps/releasing-new-web-mapping-analysis-reporting-app-exposure-management/>



Mapping 1

- Integrating map sources (e.g. in WMS) from GA, BOM, NASA, etc.
- Setting up standalone map servers with GeoServer, PostGIS, etc.
- Creating nationally-consistent tiled web maps (e.g. contours)





Mapping 2

- Containing a full set of **digitising**, **editing** and **measurement** tools
- Creating various shapes (e.g. polygon, rectangle, circle & polyline)

Exposure Management: Location Profile & Risk Analytics

For all locations across Australia - A national platform


Applications: Emergency planning & response, insurance underwriting & claims, news media & news reporting, asset management, property location information, etc.


Locations: Residential/commercial/industrial addresses, incident and disaster sites, etc.

Exposure in Potential Impact Area

Total Number of Addresses:
Estimated Population:

Exposure Estimation | Location Profile

 **Portfolio Level**

 **Site Level**

Here we calculate how many addresses (based on 02/2018 Open G-NAF, a representative exposure dataset) and estimate how many people are located within the potential impact area. **Please digitise your Area of Interest (AOI) first.** Detailed statistics by exposure types and hazard levels are also provided.

Shape

circle

Size

158,809.333 m²

Perimeter

1,412.677 m

Radius

224.835 m

+ Layer

Exposure Only

Calculate Exposure



Analysis 1 – Portfolio Level

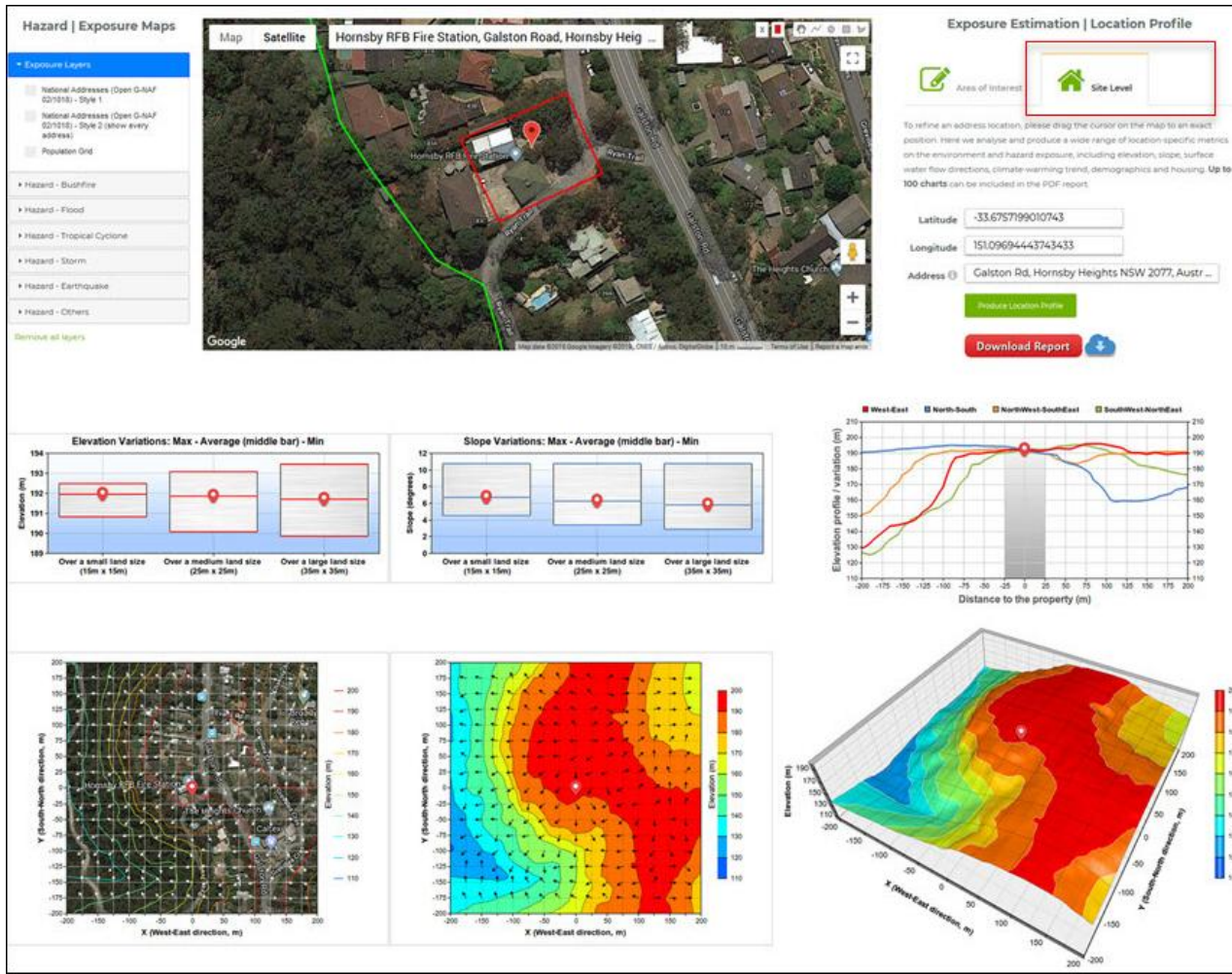
- Any type of exposure data (e.g. sum insured) can be analysed.
- Example: Rapid exposure estimation for Severe Cyclones Veronica & Trevor on WA & NT coasts, respectively, during March 2019.





Analysis 2 – Site Level

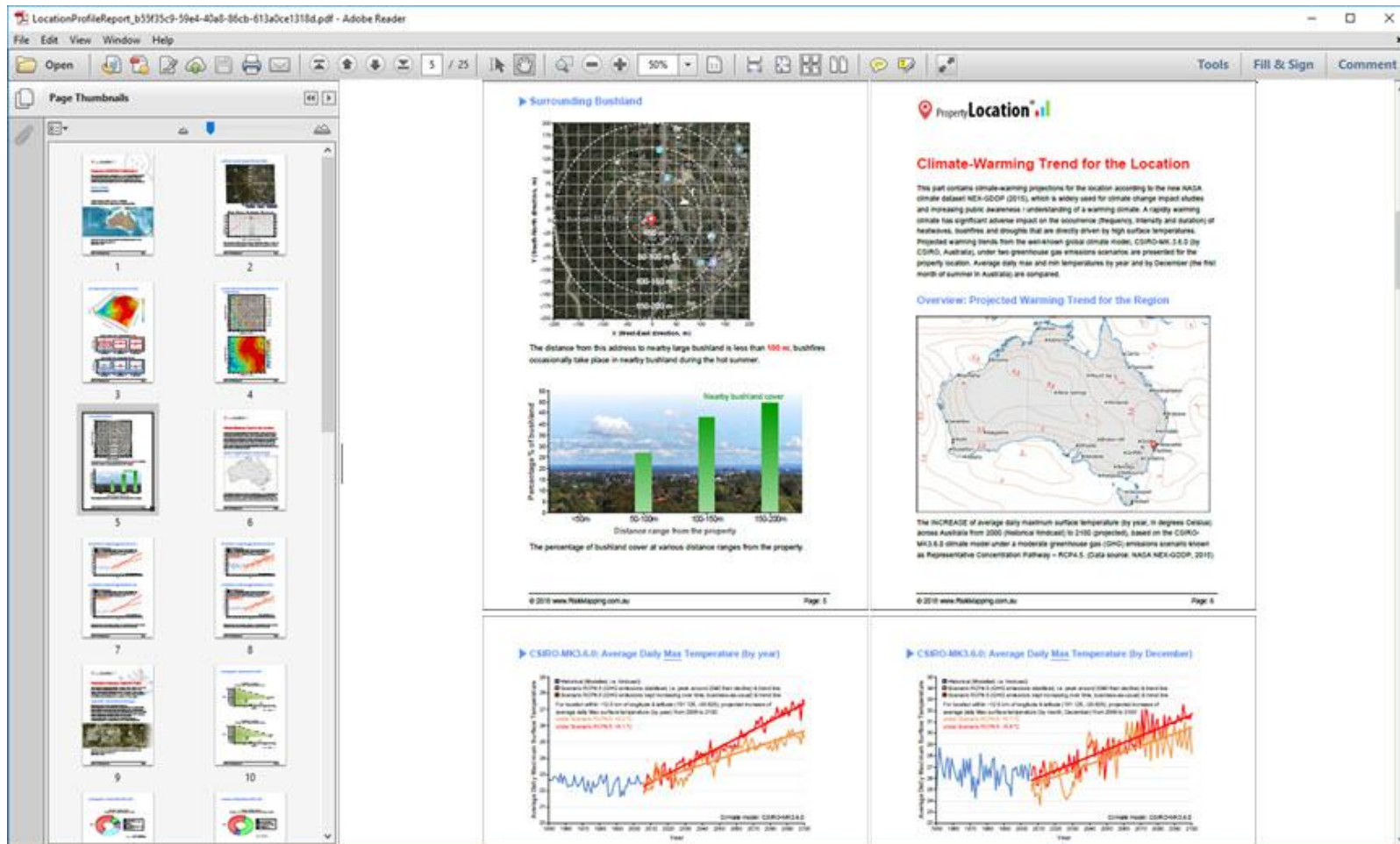
- Important for location sensitive perils (bushfire, flood, etc.)
- Producing more than 100 location metrics in seconds and making **measured contextual insights** accessible.





Reporting

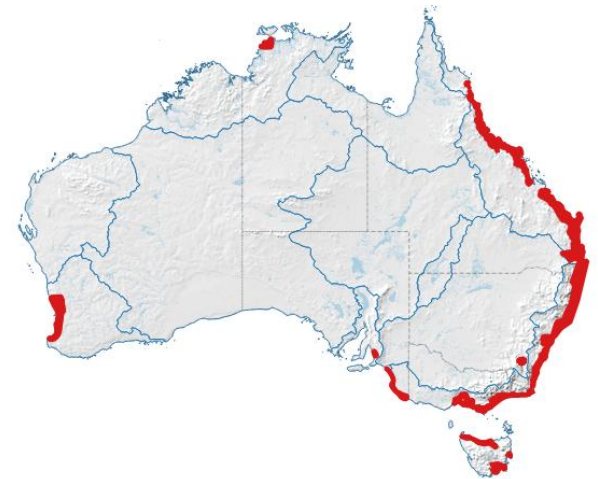
- Key maps and metrics instantly shown in Browser (they may be used as data / business intelligence dashboards)
- All analysis results in downloadable PDF report (up to 40+ pages)





3. Web Maps on Terrain & Hydrology

Unique and accessible tiled web maps on **high-resolution contours**, **modelled surface water flow directions** and **shaded relief**.



High-resolution maps cover ~70% populated areas in Australia, including most major flood-prone regions predominantly in the east coast.

Feedback from map reviewer: *"I'll never look at flood maps the same way again..."*.

Blog: <https://www.bigdataearth.com/flood/two-additional-tools-advance-flood-risk-analytics-scale-australia/>



3. Web Maps on Terrain & Hydrology (Cont'd)

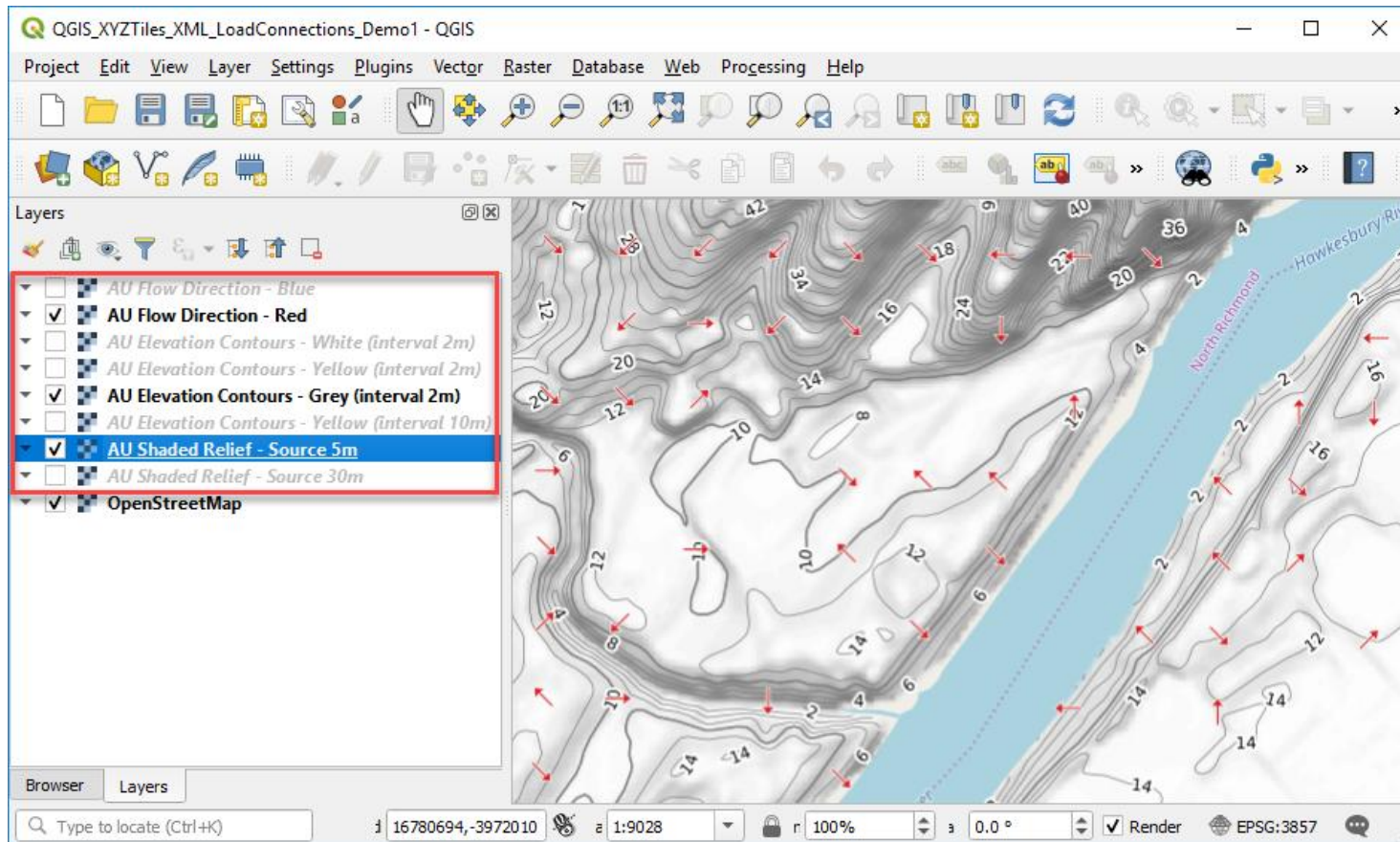
- Consistently-styled & scalable (display at multiple zoom levels)
- Easy integration with **web**, **mobile** or **desktop mapping**





3. Web Maps on Terrain & Hydrology (Cont'd)

- Based on Geoscience Australia's **5m-resolution DTMs**
- Enabled by **modern cloud infrastructure** with multiple web services
- Instant access and rapid delivery via **APIs**





3. Web Maps on Terrain & Hydrology (Cont'd)

Application 1: Investigating riverine flood-prone areas before, during and after flooding in a web mapping environment



Blog: <https://www.bigdataearth.com/australia/applications-new-national-contour-web-maps-part-3-identifying-riverine-flood-prone-areas/>

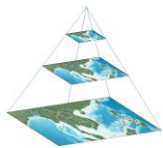


3. Web Maps on Terrain & Hydrology (Cont'd)

Application 2: Identifying low-lying coastal areas susceptible to storm surges, sea-level rise, erosion and tsunamis.



Blog: <https://www.bigdataearth.com/australia/applications-new-national-contour-web-maps-part-2-identifying-low-lying-coastal-areas/>



Summary - BigData Earth Products & Solutions Enabled by Geospatial Big Data Analytics & Cloud Computing

Main Application Areas, e.g.	Implementation
1 – Property/Exposure Location Profile Report	Web APIs / Apps / Maps
2 – Bushfire Risk Analytics	Web APIs / Apps / Maps
3 – Flood Risk Analytics	Web APIs / Apps / Maps
4 – Tropical Cyclone Risk Analytics	Web APIs / Apps / Maps
5 – Exposure Analytics	Web APIs / Apps / Maps

- Most R&D is on **property location** and **hazard risk analytics**. Most energy on developing and applying new technologies (**Web APIs, Web Apps & Web Maps**) to support two cloud-based geospatial big data and analytics platforms, with applications in Australia and overseas.
- New opportunities are created by **geospatial big data analytics** and **cloud computing**. A range of new products have been developed at scale with significant use of **automation** and **optimisation**.
- A transformative journey from **desktop computing** to **cloud computing**! Seeking broad client interests and extending our R&D experience for new & innovative applications.



Contact:

Dr Keping (Kevin) CHEN

R&D Innovation Scientist & Director

BigData Earth Pty Ltd

Sydney, Australia

(+61) 404 816 903

Keping.Chen@BigDataEarth.com