Impact-based forecasting for the coastal zone

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Developing a pilot capability to estimate the impacts of East Coast Low hazards on the built environment, enabling more timely mitigation action by a range of stakeholders.

**PROJECT GOAL**

The project aims to quantitatively estimate the impacts of a severe wind and rain event on the built environment to enhance the Bureau’s Severe Weather Warning information delivered to stakeholders in the emergency management sector (see Fig. 1 for an example).

**PROJECT METHODOLOGY**

We combine wind and rain hazard information from the Bureau’s high-resolution weather forecast models with building exposure data from the National Exposure Information System (NEXIS) and vulnerability measures derived from emergency services damage assessment survey data from past severe weather events.

Geoscience Australia’s impact modelling capability then produces a prognostic estimate of damage to the built environment based on the forecast model output (Fig. 2). The impact information is primarily intended to flow into Visual Weather, the Bureau’s primary operational data display system.

**PROJECT RESULT 1:**

**Spatial scale of accurate NEXIS exposure data:** A desktop survey of residential building attributes for Dungog NSW has revealed that the statistically sampled house types within NEXIS do not provide an accurate estimate of actual house types at the single town scale (Fig. 3). The conclusion is that the project’s impact forecasts should be delivered at scales larger than the single town scale.

**PROJECT RESULT 2:**

**Need for more detail in damage survey data:** Examination of damage assessment survey data from the NSW SES (Beacon) and Fire & Rescue NSW (EICU) has demonstrated the need for a categorical data field to identify the dominant hazard (i.e. wind, rainfall, hail etc.) causing the damage, and the assignment of a damage category (none, minor, major etc.). This will permit the attribution of the degree of damage to the underlying hazard or hazard combination.

**PROJECT PLANs**

This project intends to use multiple severe weather cases to establish more robust vulnerability relationships for wind and rain. While case data collection takes place, the project will utilise generic interim wind/rain vulnerability relationships to build a full workflow as shown in Fig. 2.