

# Cross-council heat mapping: lessons from an unsuccessful project

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## Overview

Heat mapping can provide valuable data to inform strategies to address climate change impacts, so as to improve liveability in a region. However, obtaining data for heat mapping may require technical expertise and specialised instruments, and is dependent on weather conditions and other variables. It can be a costly and complex exercise.

## Background

Failure is something we don't like to admit to or talk about. We all fail at some point but how do we learn from the failures and avoid the blame game? As climate change adaptation is an iterative process it is important to reflect upon our failures to ensure lessons are learned and mistakes are not repeated. This case study examines some of the issues that arose and prevented a Building Resilience to Climate Change grant project from achieving its outcomes.

The project proposed using a combination of high-resolution remote sensing analytics from an aircraft flyover with concurrent ground measurement to map the distribution of urban heat islands across six council areas. The collected data was to contribute to the development of mapping tools to identify current hot spots and quantify the impact that adaptive actions such as vegetation, variations in building density and specific materials would have on air and surface temperatures either in a specific location or at building scale.

In the project development stage, the following risks were identified:

- A prolonged procurement process for aerial data collection due to complexity and technical specifications.
- Cross-council decision-making processes potentially causing delays. It was identified that steering committee timelines, communication channels and conflict resolution processes all needed to be established.
- The data collection was weather dependant. Three consecutive days of high temperature and no rain was needed, with sufficient time to schedule and plan the flyovers. The outlook for early 2015 was drier and warmer than normal, therefore the expectation of weather delays was deemed a low risk.

## Implementation

The initial project was scoped for six councils. However, after the grant was awarded the scope increased to 11 council areas. The project was managed by a steering committee of council officers from the participating councils and an academic from a partnering university. The steering committee went through a tendering process for an aircraft to fly over with specified remote sensing equipment. Due to the highly technical nature, the academic provided considerable input into the complex discussions and subsequent planning with the preferred supplier. This process included:

- Maps of the flight transects and of on-ground routes to drive that would mimic the fly-over as closely as possible;
- The supplier's plan for how the team would mobilise when the flight began, including getting permission from and liaising with Air Traffic Control, attaching heat sensors to vehicles, allocating drivers and vehicles to routes, and downloading data from the sensors at the end of the drive.

The summer of 2015 was milder than expected and the high temperature conditions required did not eventuate. It was at this stage, that a variation to the grant was approved to extend the project to the following summer.

Conditions in the 2016 summer proved suitable and the interstate supplier for the airborne component started to prepare for the flights. Unfortunately, the plane broke down and the team did not make it to Sydney. Concurrently, the academic from the partnering university abruptly left his position and moved interstate, effectively pulling out of the project. This created confusion amongst the project partners as what had been agreed to and by whom.

As the grants administrator, LGNSW asked for the work on the project to cease until an alternative project plan could be developed and approved. Discussions were held with the university about honouring their informal agreement with the councils. However, the withdrawal of the technical support provided by the academic was considered untenable by a participating council and the steering committee requested that the project be cancelled.

## Key Learnings

- The scope increased beyond the approved project. While leveraging funds is a great way to increase the outcomes of a project, additional project partners and scope can add to the complexity of delivering a project.
- There were competing needs and timelines of the project partners. The project would have benefitted from tighter project management and better communication between all parties.
- No formal agreement existed between any of the project proponents i.e. the participating councils and the university. A letter of support from the academic was provided as part of the grant application, however the university did not recognise this letter as a formal contribution to the project. A memorandum of understanding, contract or other form of agreement may have prevented the partnerships dissolving.
- The proposal was untested, highly technical and relatively costly; with the majority of grant monies devoted to data collection, and the subsequent tool development being provided "in-kind" by the university. A similar project funded in the same round of the Building Resilience to Climate Change program, Adapting to urban heat events: by mapping vulnerability hot spots, Penrith City and Leichhardt Council, used existing Landsat Data imagery provided by CSIRO for free under license. This proved a cost-effective and useful way to present the distribution and intensity of heat islands to inform strategic planning by council.
- High resolution data may be necessary to model impacts of surface properties (such as the albedo of specific building materials and corresponding energy costs). However, it is important to clearly understand the purpose of complex data, and whether its resolution fit for purpose.



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