Information Exchange for Multi-Hazard Incident Notifications
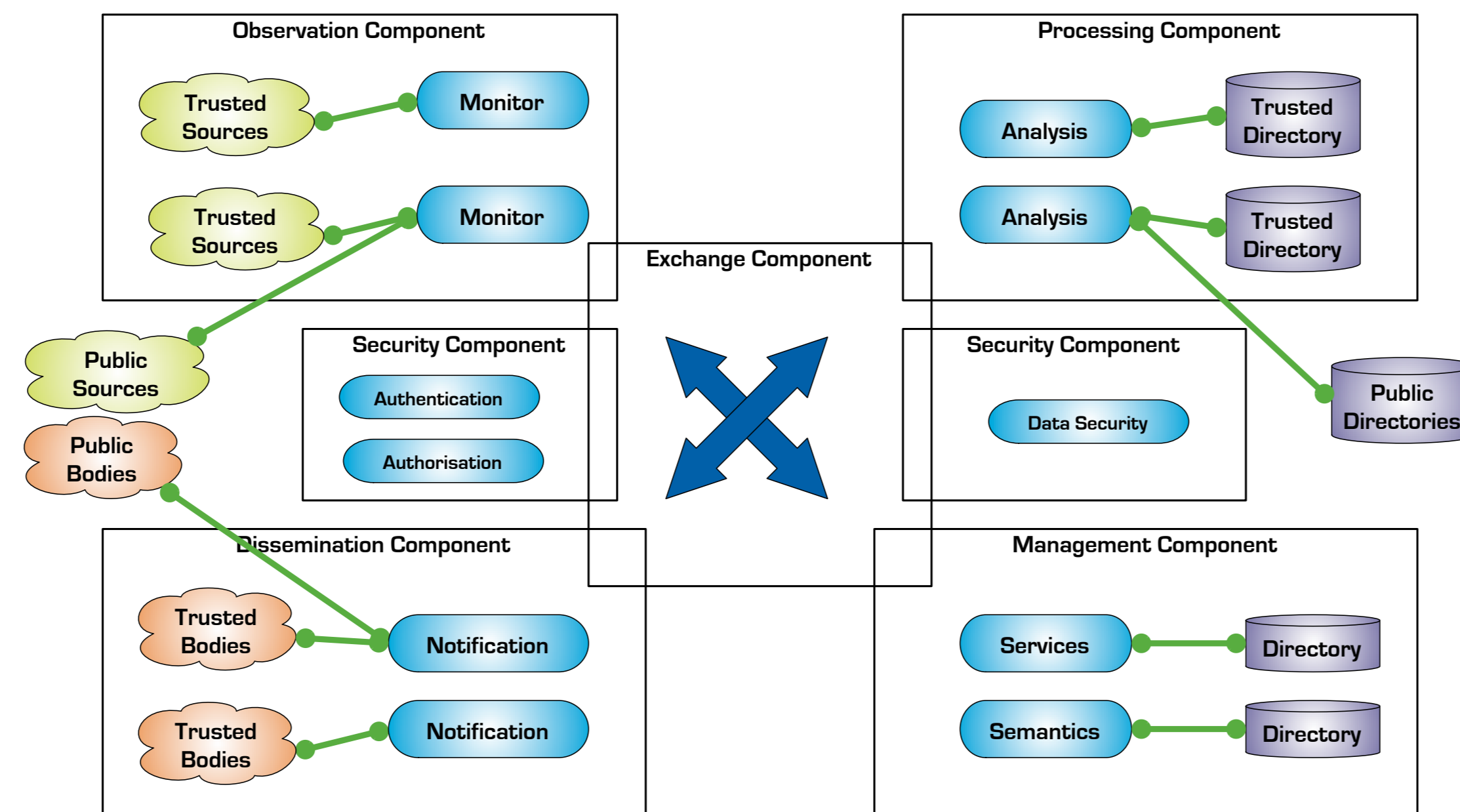
Information Exchange Architectures
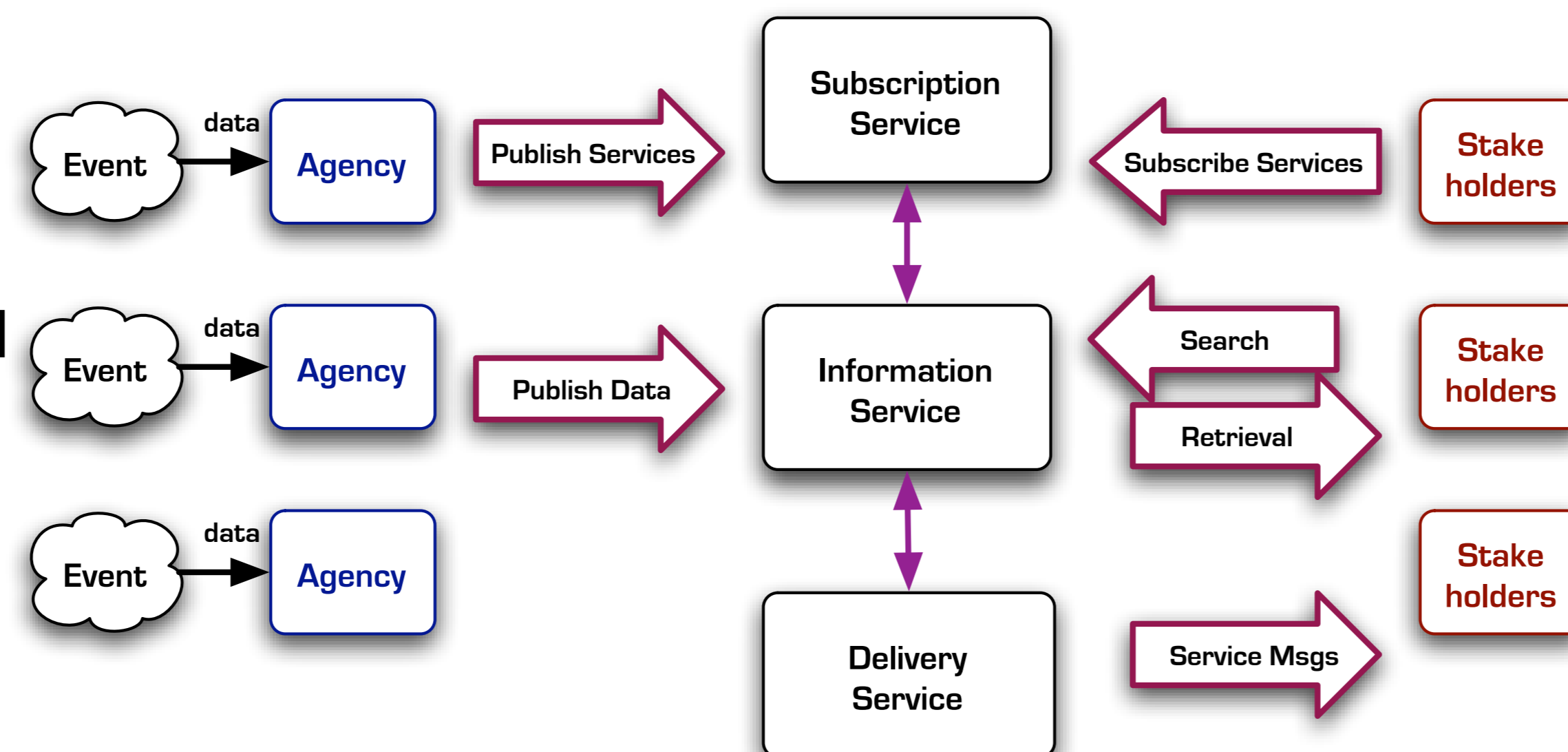
Framework to support:
- Data Collection
- Information Processing
- Information Integration
- Semantic Mapping
- Decision Support
- Incident Notification
- Trusted Sources
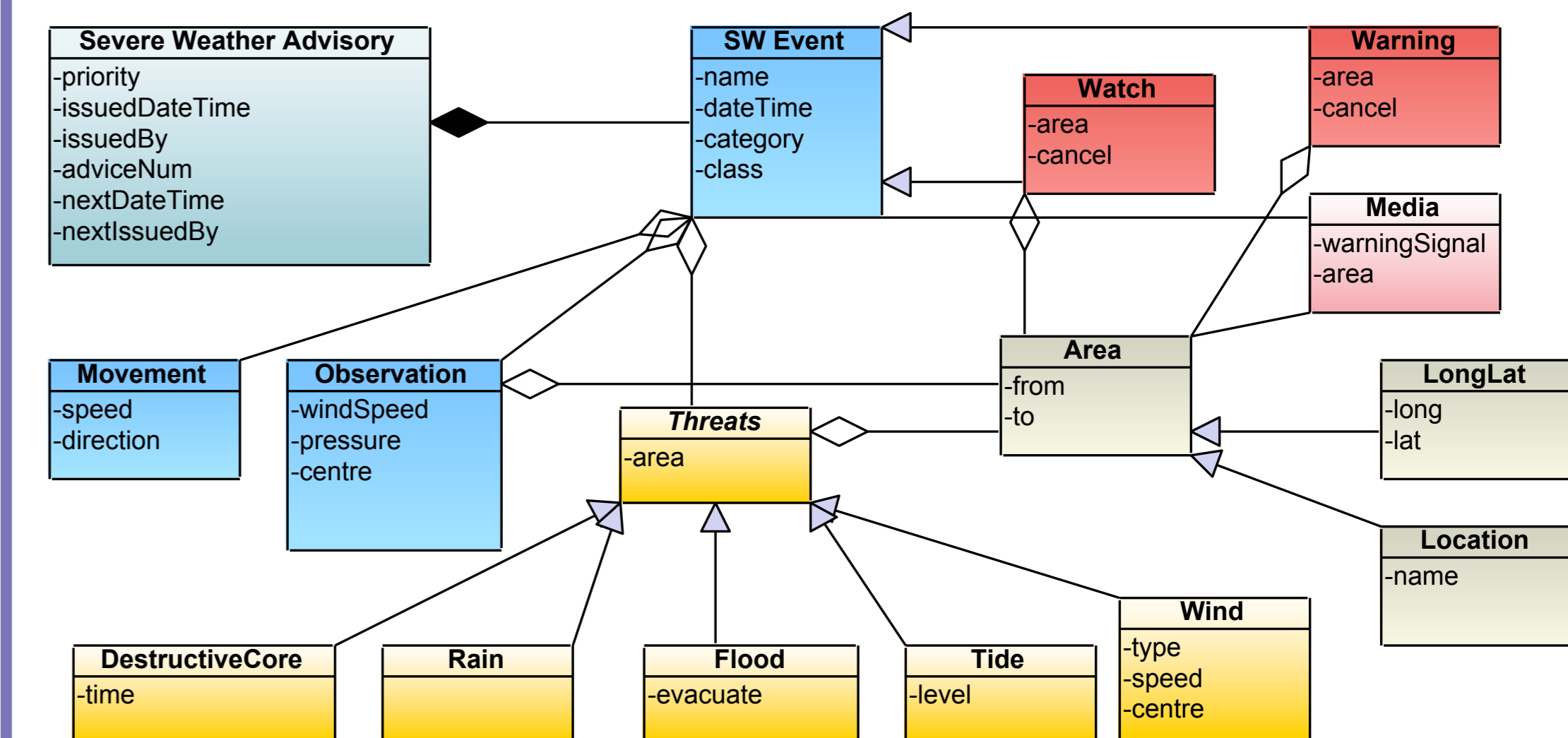

CAIRNS Demonstrator

- Agencies publish services and corresponding event data
- Stake holders subscribe to services based on spatial, role, and type criteria
- CAIRNS integrates services and delivers messages based on matching requirements
- Demonstrate emerging EDXL standards
- Search and retrieve model to find historical data

The Cooperative Alert Information and Resource Notification System (CAIRNS) demonstrator showcases technologies for keeping stake holders informed of current emergency incident information
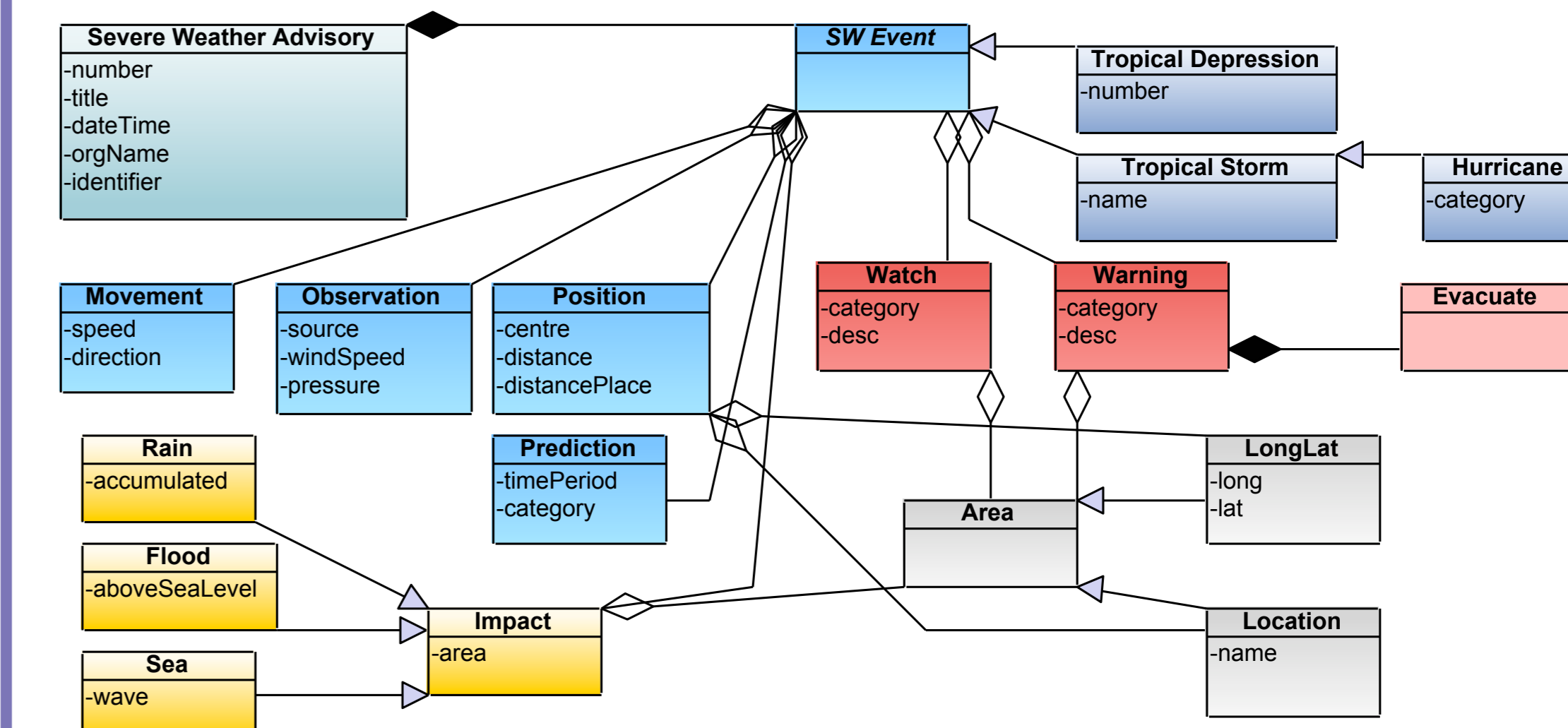

Case Study: Severe Weather Advisories

UML Models of Severe Weather Advisories (based on the analysis of existing textual warnings) will enable machine-readable incident information to be shared more effectively and more efficient integration with other information sources

Cyclone Ingrid (Australia)

Hurricane Katrina (USA)

Disaster Prevention, Response, and Recovery Project

Safeguarding Australia Program
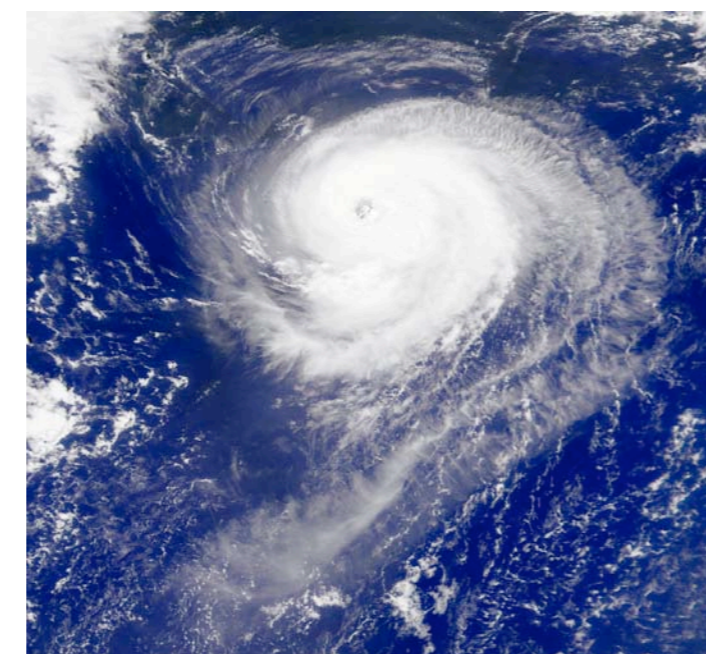
Queensland Research Laboratory

Overview

The Disaster Prediction, Response, and Recovery project aims at developing new technologies, systems, and services that will provide significant improvements to the devices, systems, information, and human processes that manage the mitigation of, and response to natural disasters (eg cyclones) and emergencies (eg terrorism).

The project will build on the current and future technological issues facing the stake holders and develop outcomes to meet the strategic needs of the disaster and emergency sector. The project will forge linkages with research institutes, standards consortia, and industry groups. The project will have over 40 research staff and students and is funded to $14M over 4 years.

Stakeholders

- Queensland State Government Agencies:
  - Department of Emergency Services
  - Department of Premier and Cabinet
  - Information Queensland
- The University of Queensland
- Queensland University of Technology
- Griffith University

Research

Smart Sensors

This research considers the acquisition and understanding of the real-world environment through the meaningful integration of various types of sensor inputs. The focus is on smart reconfigurable hardware, embedded systems, and algorithms for pattern recognition, position sensors, and array processing for computer vision and audio signal processing.

Information & Human Understanding

This research covers information management including modeling, representation, and integrating information and situations from multiple sources into a cohesive framework to support incident notification and decision making. The research will also investigate issues with human behaviour and human interactions and experiences with emergency systems and information.

Modeling & Agents

This research addresses the formal modeling and understanding of dynamically changing environments in emergency and disaster services. The aim is to formally represent and effectively reason about real-world situations that involve over-constrained resources, risk factors, and real-time decision making.

Autonomic Networks

This research will investigate principles and solutions for protocols and middleware to support adaptable, self-configuring, self-healing networks and applications. The work focuses on the network protocols and context management facilities required to achieve an optimum level of communications and situation-aware services in emergency response scenarios. This research will also consider methods of inferring the location of disaster areas and impact zones based on information gathered by network and application monitoring.