

Balancing Growth and Natural Beauty

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A rapidly growing community on Australia's eastern coast needed to balance economic development with ecological preservation. A GIS-based planning support system from Community Analysis and Planning Systems, Inc., let city planners develop and test multiple scenarios to arrive at the best solution.

The shire (township) of Hervey Bay is in the Wide Bay–Burnett region of the State of Queensland and occupies approximately 2,340 square kilometers. North Fraser Island, a World Heritage area, accounts for nearly half of the shire's total land area. *[The United Nations Educational, Scientific and Cultural Organization's World Heritage Committee designates outstanding physical, biological, and geological features; habitats of threatened plants or animal species; and areas of scientific or aesthetic value in its list of World Heritage sites.]*

Like many coastal townships, Hervey Bay is experiencing strong population growth. Within the last decade the shire's population has doubled to more than 44,000 persons. By 2021, the shire's population is expected to nearly double again to more than 77,000 persons. Consequently Hervey Bay faces major land use planning issues.

ESRI business partner Community Analysis and Planning Systems, Inc., collaborated with an industry partner, the Queensland Department of Local Government and Planning, and the

Hervey Bay City Council's Integrated Planning Unit (IPA) in developing a sustainable land use scenario. Using ArcGIS 8 and What if? 1.1. from Community Analysis and Planning Systems, the planning scenario developed spans the period between 2001 and 2021. The effort was funded by a research grant from the Australian Research Council, which received in-kind support from the Hervey Bay City Council.

Formulating a sustainable planning scenario required many data inputs. Socioeconomic data inputs included population projections, industry employment projections, projected average household size, and the projected number of dwellings. Physical and environmental data inputs consisted of cadastral land parcels, building footprints, road, sewer, water, land use, remnant vegetation, national parks, state forests, riparian vegetated areas, coastal wetland, areas of prime agricultural land, areas of indigenous significance, and existing open space. These data layers were acquired from Australian national, state, and local government agencies including the Australian Bureau of Statistics, the Queensland Department of Local Government and Planning, the Queensland Department of Natural Resources and Mines, the Queensland Environmental Protection Agency, and the Hervey Bay City Council.

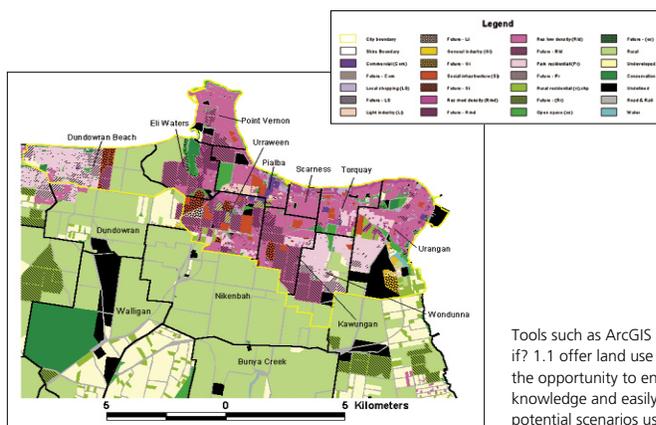
Once all of the data had been collected and entered into What if? 1.1, the Hervey Bay City Council IPA could simply begin running and

testing various planning scenarios. The process was iterative. A number of draft scenarios were formulated and compared before the final scenario was derived. For each draft scenario, council planners specified which suitability factors would affect the future allocation of specific land uses. What if? 1.1 presented the planners with an intuitive interface that allowed weightings and ratings to be assigned to different suitability factors in order to generate alternative land use scenarios on the fly.

The final scenario incorporated areas of environmental and economic significance and allowed trade-offs between these sometimes conflicting uses. Overlaying city boundaries and city land capacity allowed analysis with respect to the projected land use location allocations for 2021 and showed that city boundaries needed to be extended to accommodate for the projected increase in low density residential and park residential land use categories.

In rural and coastal local government areas in Australia, strategic plans are updated and gazetted (i.e., published) every five to six years. Traditionally these plans have been formulated by evaluating and interpreting paper maps and tabular information. Tools such as ArcGIS and What if? 1.1 offer land use planners the opportunity to encode expert knowledge and easily visualize potential scenarios using GIS. Placing this type of knowledge into a GIS means that numerous scenarios can be easily generated, tested, and regenerated. These scenarios can be presented to council members and the community for feedback, ultimately leading to improved decision making.

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