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WA Water Online Transformation: WRIMS Integrated Spatial Resource Mapping

The Customer

The Department of Water and Environmental Regulation (DWER) supports Western Australia's communities, economy and environment. It manages the state's surface and ground water resources. The ongoing Water Online project is delivering significant improvements to information reliability and process efficiency as well as opening up key water information analytics for the Department. The launch of a contemporary Customer Portal and subsequent integrated COMPASS compliance and licensing system were the first stages of the Department's e-business transformation.

The Challenges

For DWER to appropriately assess the impact of licence renewals or applications, the foundation data it relies on must be accurate. Existing tools did not allow its staff to confidently update resource availabilities. Some groundwater areas across Western Australia have multiple aquifers and surface water systems with different management units, and specific licensing and allocation business rules. Picking up these influences on other related management units was critical. DWER could not draft or test new information before committing to changes. The results were inaccurate, with gaps in land/water use mapping. And assessments could not be validated against business rules.

Vast amounts of spatial topology data had been manually grafted into DWER's hand drawn resource boundaries since 1917.

Customer

- WA Department of Water and Environmental Regulation

Industry

- Government / Resources

Challenges

- Error prone resource mapping
- Assessments could not be validated against business rules

Solution

- Advanced spatial database engine and management toolset
- Seamlessly integrated with backend systems
- Flexible, editable service

Results

- Quantified and qualified information to better manage WA's water resources
- Credible, consistent, transparent decision making - state-wide
- Ease of use for all, including non-technical, staff

DWER mapping credible, consistent, transparent decision making

The Challenges

This data was not improved or maintained, and over-time the accuracy and alignment of areas became an issue. Data migration to any new system would be particularly difficult because: “We didn’t know what data was correct or corrupt. We all sweated blood and tears to get it right,” Guy Chandler, Acting Senior Water Allocation Planner at the Department of Water and Environmental Regulation said.

With NEC, DWER introduced an innovative spatial integration project to capture quantified and qualified water resource information. And, to inform improved decision making, its workflow design was crucial for updating and maintaining that data. The Water Resource Information Management System (WRIMS) is a spatial database engine and management toolset that is seamlessly integrated with DWER’s backend COMPASS system.

NEC’s integration work ensured effects such as creating and updating spatial boundaries on each resource type would flow seamlessly throughout the system.

The Solution

Key to success was not only the introduction of advanced spatial technologies but the integration work that would provide a single, accurate source of information to every point in the business.

The NEC design created new tables, layers and views within each selected resource. Individual surface and ground water mapping components linked to water availability and Geocortex layers. Information had been isolated in different areas of the business. NEC’s integration work ensured effects such as creating and updating spatial boundaries on each resource type would flow seamlessly throughout the system.

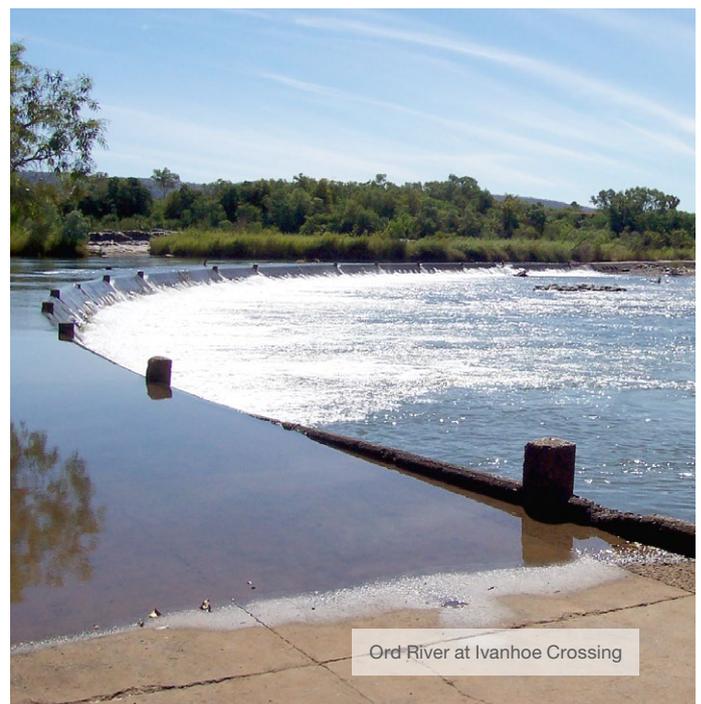
NEC undertook the complex links between the WRIMS spatial data environment - including master data management, the Geocortex spatial database engine and spatial viewing - to DWER’s COMPASS platform.

NEC Services

- Business process consulting
- Program and project management
- Applications development and testing of custom software

Hardware / Applications

- Microsoft Dynamics CRM 2016
- Microsoft’s ASP.NET MVC 5, Microsoft Web API and SQL Server 2014
- Microsoft .NET
- Knockoutjs, ESRI API for JavaScript 3 & 4, asyncjs, npm
- Microsoft Visual Studio and Team Foundation Server developer tools
- Octopus Deployment Manager
- Geocortex spatial database engine
- GIS Arc toolset



Ord River at Ivanhoe Crossing

The Solution



The newly introduced business rules overcome previously overlapping or missing fields, and inconsistent naming conventions. They pick up related management units and licences, and run spatial and licensing impact processes.

Pre- and post- migration validations were built in to ensure all amendments, such as new resource shapes, are accurately captured. This is critical to the future maintainance of and improvements to the spatial data.

Vital to WA's water sustainability is WRIM's analytics. These fit into the wider business rules, records management and workflows. They also have a preview function for the drafting officer to determine what issues may occur before completion of a request.

The Results

WRIMS completes the capture and mastering of water resource information and allocation limits supporting DWER's planning-related activities, licensing and compliance.

The embedded spatial tool, integrated with the automatically updated COMPASS system, delivers a full and accurate understanding of current state. Staff can also model the impact of prospective licences. The underlying spatial data set shows when a plan area is under review so users can assess future water availability changes. Licensing team decisions are then made in light of the latest data attributes and allocation limits.

But it is the design of the spatial integration that is having the greatest bearing on the veracity of DWER assessments. The tool allows officers to draft new information on a mapped feature and model the extent of impact of a proposed licence amendment. Using the embedded spatial viewer, DWER can query resource data and quickly see key information. The paperless, end to end process is delivering accurate, rapid turnarounds.

"For the first time we can track ground and surface water in the one system and see actual shapes at the click of the mouse. Astonishingly, these availability checks can be calculated by WRIMS within 1 minute," Chandler said.

"The ability to test the effect of licenses against spatial business rules means we can justify our responses when we commit the process into COMPASS. This is a big step for us."

The new dashboards, with structured workflows, allow to staff

to easily see and run reports on water usage information as well as allocation limits and water availability for a resource, over time. "We have all the histories, all the signatures - one source of the truth," he said.

With the fully integrated Customer Portal, COMPASS and WRIMS platform, DWER has the foundation for the next decade: "It is what we need now, plus the capacity to look forward to new water resource services such as managed aquifer recharging," Chandler said.



Government of **Western Australia**
Department of **Water and Environmental Regulation**

"For water sustainability, both environmentally and economically, our understanding of usage and changes in real time is critical to sound decision making. The spatial mapping intelligence provided by WRIMS is business changing."

Guy Chandler, Acting Senior Water Allocation Planner, WA Department of Water and Environmental Regulation

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