© klublu/Shutterstock.com

# MARCHING IN STEP

SPAIN'S GOVERNMENT AND ARMY FOUND THAT THEY WERE REPEATING MANY OF THE SAME GEOSPATIAL TASKS, SO DECIDED TO COMBINE TWO SEPARATE DATABASES INTO ONE. HOWEVER, INTEGRATING EVERYTHING INTO A SINGLE SCHEMA AND THEN UPDATING IT PROVED A FORMIDABLE TASK. CHRIS TAGG EXPLAINS HOW THE CHALLENGE WAS MET AND OVERCOME

In 2010, having found themselves repeating many of the same tasks, IGN (National Geographic Institute) in Spain and CEGET (the Spanish Army Geographic Centre) took the decision to collaborate on a mapping solution that would be more efficient and more economical to implement. Until then, both organisations had been working separately, maintaining separate databases.

IGN and CEGET invited companies to present a prototype mapping of one province in Spain to see how the concept would work. The group chose Sinfogeo, a GIS consultancy based in Spain, for the project. "They liked our ideas. They were looking to be able to harmonise two databases into one so that they could generate the same 100k scale product. The idea was to collaborate, create a more efficient structure and, at the same time, save money," explains Jimena Martinez Ramos, who was Sinfogeo's manager for the project.

After a successful consulting and prototype phase, the project was put out to public tender and awarded to Sinfogeo to complete the production of a new national 100k and 200k scale cartographic series in Spain. This involved the integration of the BCN200 product from IGN Spain and the C series product from CEGET. "We won the tender because we had a very good technical proposal and a fair economic proposal," Martinez Ramos says.
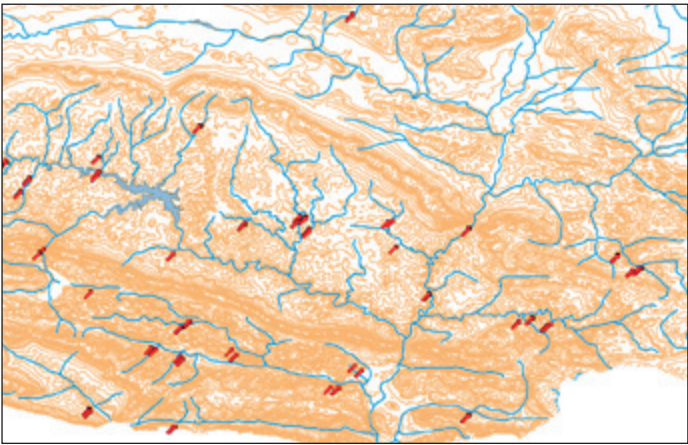
The project required Sinfogeo to integrate and harmonise the two differing data models into a single schema and to update existing content using SPOT5 imagery of all 50 provinces of Spain – an area of 505,992km$^2$. Underpinning this was the necessity to assure the quality of all the data to produce an accurate final product.

A major hurdle that had to be overcome from the outset was the quality and consistency of the data sources. The data being used had been collected by both organisations separately over many years. A great deal of work was needed to harmonise the data to fit into one combined data model, whilst satisfying the different requirements and usages of the new data product moving forward.

"Getting two different parties to not only share their data but agree on solutions was always going to be difficult, but we achieved a good

The 1Spatial cloud platform


Overview showing location of errors in data


Users can go directly to the errors – this rule showed where rivers intersected the same contour line more than once

balance and the different organisations worked really well together," Martinez Ramos explained.

The other big challenge was co-ordinating the team submitting data from across Spain and ensuring the quality of the final data once submitted. Sinfogeo was faced with the prospect of deploying software across the desktops of all the contributors to perform quality assurance. This would have meant either a large outlay on set-up, time and support in purchasing licences for everyone working on the project or opting for a server-side option, setting up maintenance contracts and delivering training, which would have sent the project way over budget.

In addition, Sinfogeo would have needed to author their own business rules to use as quality confirmation and validation checks. This would have meant hiring people with specialist skills, which would have increased the timescale and increased the cost of deployment.

## Partnership working

At this point Sinfogeo decided to bring in a partner and, after consideration, opted for 1Spatial. "I had read about the company and was confident they had the quality control solution online (or cloud-based) we needed to create a flexible set of rules that would overcome the challenges we'd come up against," explains Martinez Ramos.
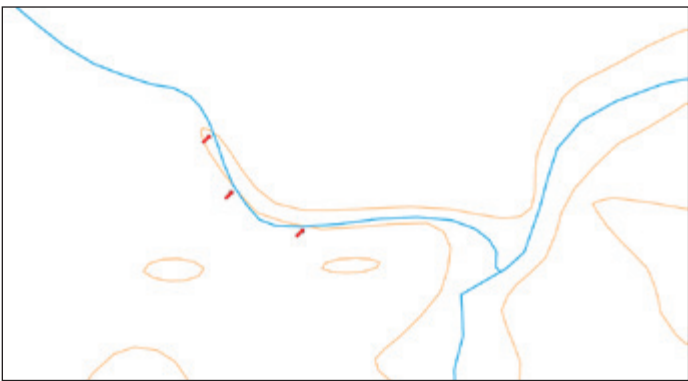
"Basically we knew we needed rules, but we didn't know how to program them. 1Spatial understood our needs and we were able to quickly create and test the rules the government and army needed. This also meant we didn't have to hire and pay development staff at our end to come up with new solutions, which would have been very costly and time-consuming," she adds.

By using 1Spatial's cloud platform, Sinfogeo was able to underpin the quality assurance of the project at every step of the data supply chain. The company could also take out of the equation all the expensive and time-consuming activities of setting-up hardware and software across team member sites throughout Spain.

Sinfogeo worked closely with 1Spatial's team to author and develop customised rules for the project. The data quality ruleset that was created consisted of rules for every feature type. This was to ensure that the features themselves were correctly captured and attributed – for instance, checking the geometric integrity of features and validating attribute values.

More sophisticated rules to verify the relationships between features of differing feature types were also widely used and consisted of a mixture of geometric and attribute-based rules across multiple feature types. This ensured that features of one type interacted with other feature types correctly. Connectivity rules for hydrographic and transportation feature types also ensured fully connected networks.

Once the rules were finalised they loaded them into the cloud service so team members could access them. By using the exact same set of rules designed by 1Spatial, Sinfogeo would guarantee that all data submitted would have gone through quality control and matched the same standards. Contributors simply submitted their data to a single service and a validation report was sent back in minutes. The report provided an overall view of the data quality and allowed them to pin-point the exact location of any data errors so that these could quickly be fixed before being sent to the system for completion.

"By using 1Spatial Cloud, we were able to save at least a quarter of the quality control time. This was mainly down to the flexibility, ease of use and speed in getting the team up and running. Plus the service is always available online," says Martinez Ramos.

## Training

To overcome the problem of training its own technicians, Sinfogeo opted for an e-learning approach and used 1Spatial's online training alongside creating their own modules and materials. "This mobile training solution worked very well, as we were dealing with a very detailed solution with a big learning curve and they could go through the training at their pace and timescale," added Martinez Ramos.

The final phase of the project involved generalisation so that both the Spanish Government and Army could use data at different scales and derive multiple, different products from the database – something they could not have achieved without an authoritative and trusted dataset.

The deadline for the project was fairly flexible as it was an unknown quantity, but Martinez Ramos says they finished in a timescale everyone was happy with. The final database is now being used by the Spanish Government and Army, which going forward will need to manage and update the database between them. This will create major savings for both parties in terms of time and money as they will be maintaining one communal database rather than two individual ones. And the project itself has achieved its goal – providing them both with the same quality assured data from the off-set.

"We were all learning to collaborate on this project," concludes Martinez Ramos. "Along with 1Spatial, we have shown that balance can be achieved between different parties to meet specific goals – this is the proof".

***Chris Tagg is head of pre-sales and product management at 1Spatial (www.1spatial.com)***