

OPEN GEODATA TO SUPPORT AGRICULTURAL RESEARCH

D. P. Drucker¹, D. M. Pinto², E. C. Cardoso³, D. O. Custodio², D. C. Victoria¹, B. T. Almeida², I. Pierozzi Jr.¹, C. L. Machado³, V. V. S. Brandão², G. Bayma-Silva⁴, M. R. C. Laforet³, C. M. Takemura², L. H. Oliveira⁵

¹ Embrapa Informática Agropecuária,
² Embrapa Monitoramento por Satélite,
³ Embrapa Solos,
⁴ Embrapa Meio Ambiente
⁵ Embrapa

debora.drucker@embrapa.br

Access to trustable geodata sources is crucial to understanding agricultural production expansion, transition, intensification and diversification, allowing to map land use and land cover dynamics (LULCC). On the other hand, there are challenges associated to cultural barriers related to data sharing. Researchers are often concerned with potential misuse and lack of credit for their effort in data gathering (Costello 2009) or argue they have insufficient funding or time to dedicate to data curation. Even when the sharing culture is established and the data are accessible, they may be poorly documented and their usefulness compromised (Science Staff 2011).

We describe our effort on building a Spatial Data Infrastructure (SDI) at Embrapa, the Brazilian Agricultural Research Corporation, a networked public company composed by 46 research centers distributed throughout the country. A strategy was developed within an internal process that included the participation of actors with relevant assignments to the topic (Drucker et al. 2015). Qualified teams from 12 research centers, composed of IT specialists, geographers, agricultural sciences professionals, information managers, among others, were designated to frame the SDI in five components: People, Technology, Data, Institutional Framework and Standards.

A free and open source software platform, entitled GeoInfo, was established in order to promote efficient geodata management and facilitate access to open agricultural research data, in accordance with current Brazilian policy implementation guidelines and aligned with internationally widely adopted standards recommended by OGC – Open Geospatial Consortium. A process to organize, preserve, qualify and share geodata generated by Embrapa was collectively proposed, encompassing data quality issues, semantics, metadata and webservice standards, as well as capacity building. Within the process, which comprises the preparation, cataloging and the publication stage of the data set, there are roles for professionals with different backgrounds in order to assure documentation accurateness and to prevent overloading researchers with tasks they were not trained to perform.

During the endeavour, resistance and distrust regarding open access were unwinded as researchers recognized the value of making geodata they produce findable, accessible, interoperable and reusable (FAIR) and are using the SDI to spread their scientific products and to collaborate. GeoInfo SDI enables the interoperability of heterogeneous geodata from different sources, including semantic aspects. The redundancy of efforts and investments in obtaining and producing this information is avoided and the possibilities for its integration and application in diverse areas are expanded. Next challenges include expanding GeoInfo SDI usage with geodata products deposition from all 46 Embrapa Research Centers and increasing data products exposure through the Brazilian SDI. The steps taken to build the GeoInfo SDI facilitated awareness and ripening on the subject within the institution and has the potential to provide elements that can be adapted at other organizations.

References

1. Costello, M. J. 2009. Motivating Online Publication of Data. - *Bioscience* 59: 418–427.
2. Drucker, D. P.; Custodio, D. de O.; Fidalgo, E. C. C.; Daltio, J.; Visoli, M. C. 2015. Preservação e organização da geoinformação em instituições: o caso da construção da infraestrutura de dados espaciais da Embrapa. In: SIMPÓSIO BRASILEIRO DE SENSORIAMENTO REMOTO, 17., 2015, João Pessoa. Anais. São José dos Campos: INPE, 2015. p. 3671-3678. SBSR 2015.
3. Science Staff 2011. Challenges and Opportunities. - *Science* (80-.). 331: 692–693.