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Going FAIR by the book

Accelerating the adoption of PID/DOI-enabled good practices in software communities through reference publication

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Summary
This is a report how a high visibility publication helped to foster the adoption of the FAIR principles (Findable, Accessible, Interoperable, Reusable) by encouraging the adoption of Persistent Identifiers (PID) and repository-based workflows in geospatial open source software communities as good practice.

The Challenge
FAIR Software citation in scientific publications is an emerging field [1][2]. It is driven by a range of stakeholders from academia, but also journals, publishers, object identifier registration agencies, open access repositories, learned societies, non-profit organizations and funding agencies [3].

Opportunity and Approach
The Springer Handbook of Geographic Information was originally published in 2012. For the second Edition, a team of scientific domain experts was tasked to completely rewrite the chapter about Open Source Geographic Information Systems (GIS) [4]. For this, a sample of representative geospatial Open Source projects was selected, primarily based on the range of projects integrated in the OSGeoLive umbrella project [5].

Results
This was a learning process for all stakeholders involved in the publication project. At the completion of the project, the majority of the involved software projects had minted Digital Object Identifiers (DOI) for their codebases. This caused additional software projects to mint DOI. Currently, 23 open geospatial software projects can be referenced by DOI [6].

Summary and Outlook
The Handbook project helped to create a critical mass for DOI-based references of open geospatial software among the software project communities. It also serves as a practical example for how to apply DOI-based references in scientific publications and within software projects according to the FAIR principles.

The interchange of machine-readable FAIR bibliographic metadata among infrastructures such as CrossRef and DataCite is an emerging field by itself. The set of reference metadata provided by the Handbook can be used in next steps to assess and gauge the technical readiness levels of FAIR metadata exchange.

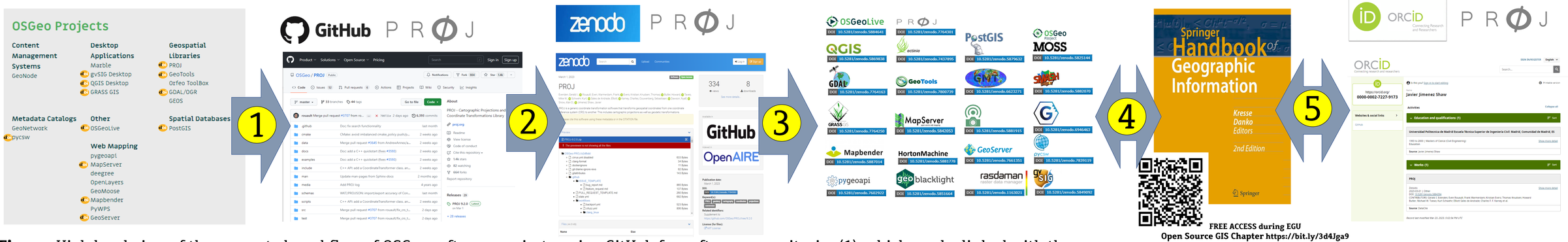

Figure: High level view of the connected workflow of OSGeo software projects, using GitHub for software repositories (1), which can be linked with the Open Access repository Zenodo (2). This coupling is already available 23 software projects (3), of which most are referenced in the Springer Handbook (4). This workflow enables due credit for members of software developer teams according to FAIR (5). This is demonstrated by the geospatial library PROJ [7].

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