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Physical Samples and Persistent Identifiers: The Implementation of the International Geo Sample Number (IGSN) Registration Service in CSIRO, Australia

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Physical samples such as minerals, soil, rocks, water, air and plants are important observational units for understanding the complexity of our environment and its resources. They are usually collected and curated by different entities, e.g., individual researchers, laboratories, state agencies, or museums. Persistent identifiers may facilitate access to physical samples that are scattered across various repositories. They are essential to locate samples unambiguously and to share their associated metadata and data systematically across the Web. The International Geo Sample Number (IGSN) is a persistent, globally unique label for identifying physical samples. The IGSNs of physical samples are registered by end-users (e.g., individual researchers, data centers and projects) through allocating agents. Allocating agents are the institutions acting on behalf of the implementing organization (IGSN e.V.). The Commonwealth Scientific and Industrial Research Organisation CSIRO) is one of the allocating agents in Australia. To implement IGSN in our organisation, we developed a RESTful service and a metadata model. The web service enables a client to register sub-namespaces and multiple samples, and retrieve samples' metadata programmatically. The metadata model provides a framework in which different types of samples may be represented. It is generic and extensible, therefore it may be applied in the context of multi-disciplinary projects. The metadata model has been implemented as an XML schema and a PostgreSQL database. The schema is used to handle sample registrations requests and to disseminate their metadata, whereas the relational database is used to preserve the metadata records. The metadata schema leverages existing controlled vocabularies to minimize the scope for error and incorporates some simplifications to reduce complexity of the schema implementation. The solutions developed have been applied and tested in the context of two sample repositories in CSIRO, the Capricorn Distal Footprints project and the Rock Store.