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MONITORING OF *PROTEUS ANGUINUS* IN SEMI-NATURAL CONDITIONS OF CAVE LABORATORY TULAR – A GIS APPROACH

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Cave Laboratory Tular is an underground facility arranged by Marko Aljančič in 1960, in a

conglomerate cave Tular in Kranj, Slovenia. The laboratory studies the behavior and ecology of *human fish*
, an endemic cave salamander of Dinaric Karst (
Proteus anguinus
Laurenti, Urodela, Amphibia), with special emphasis on conservation of this endangered species.

Previous observations of *Proteus*, kept in large laboratory pools, have only been sporadic and short termed. Many important details of *Proteus* behavior have been overlooked by the observer, mostly due to long periods of the animal's inactivity. It is therefore understandable that only a real-time and a long-term monitoring could obtain adequate information on
Proteus
behavior, as well as registering some basic ecological parameters in the observed pool (temperature, pH,
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levels etc.).

To process, analyze and visualize such large quantity of data, a more automated method is required. For more accurate visualization and monitoring of Proteus behavior we decided to use ArcGIS Desktop software and created GIS data.

For a pilot study we chose one of the laboratory pools with 14 animals. First we created a base layer – a map which represents the physical environment of the tested pool (e.g. basic topography, temperature of water and air etc.). To this base layer we added vector data of *Prote us*
activity captured during a one-week, real-time, infra-red video recording. GIS-generated maps show current
Proteus
distribution in the pool with information such as preferred areas for feeding, resting, courtship, breeding and other behavior patterns.

The method developed in this pilot project will be applied to all other pools and the results will be analyzed using GIS tools. Such monitoring will not only tell us more about intraspecific relations between animals but also about parameters of semi-natural conditions in Cave Laboratory Tular.