

Furthermore, the challenges to protect and provide sufficient areas of open soils and vegetation in the urban development process are subject of discussion for the situation of those two cities that are located in one of the warmest regions of Germany that faces intensive urban development due to population growth and land use conversions.

**Keywords:** Ecosystem Services, Urban Planning

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**(6887 - 1873) Molecular identification of ectomycorrhizal fungi occurring in pecan orchards in Rio Grande do Sul / Brazil**

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The culture of *Carya illinoensis* (Wangenh.) K. Koch was introduced in Brazil at the beginning of the last century, and became commercially important after the 1960s, mainly in the southern region of the country. The pecan is proven to be an ectomycorrhizal symbiont, forming several mutualistic associations with mycorrhizal fungi. The main objective of this study was to identify the fungal isolates from commercial pecan plantations in the State of Rio Grande do Sul. For this purpose, the basidiomas were collected, which were photographed and described macroscopically still fresh and subsequently dehydrated to Microscopic analysis, according to traditional methodology in Mycology. Part of the isolated material was conserved in 2% CTAB (cetyltrimethylammonium chloride) at -20 ° C until DNA extraction, amplification and sequencing, using the ntDNA region primers ITS1 and ITS4 (ITS1-5.8S-ITS2). The extraction was performed by DNeasy® Plant Mini Kit (Qiagen). In order to detect the presence or absence of DNA in the sample, the electrophoresis of the PCR products in 1% agarose gel was performed. After the amplification, the presence of bands was verified by the electrophoresis of the PCR products in 1.5% agarose gel. For the purification of PCR products, KitGenElute PCR clean-up (Sigma, Saint Louis, USA) was used. After sequencing, Sequenced fragments were analyzed using the Staden Package 2.0.0b program for obtaining consensus sequences. After this, the consent sequences were deposited in the GenBank and a comparative search by means of BLASTn was performed. For the identification of fungus, all the sequences were aligned. The phylogenetic relationship of the specimens was reconstructed based on analyses of the ITS region, with the analysis of Maximum Likelihood (ML) in a total of 1000 replications for all reconstructions. The model of nucleotide substitution General Time Reversible model was estimated as the best model to solve the data, performed with Gamma distributed with Invariable sites and parameters for partial exemption (95%). The following potentially ectomycorrhizal fungi were identified: *Astraeus* sp., *Hymenogaster* sp., *Inocybe* sp., *Pisolithus arhizus*, *Russula* sp., *Scleroderma bovista* and *Scleroderma* spp. From these results, it is possible to continue with research aiming at the next stages of identification and phylogenetic analysis.

**Keywords:** symbionts, mycorrhizal, *Carya illinoensis*

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**(7847 - 1891) Monitoring soil management to assess ecosystem services provision in Atlantic Forest, Rio de Janeiro**

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Monitoring soil management to assess ecosystem services provision in Atlantic Forest, Rio de Janeiro. Joyce M. G. Monteiro<sup>1</sup>, Azeneth E. Schuler<sup>1</sup>, Rachel B. Prado<sup>1</sup>, Elaine C. C. Fidalgo<sup>1</sup>, Ana P. Turetta<sup>1</sup>, Alba L. Martins<sup>1</sup>, Aline P. de Oliveira<sup>1</sup>, Guilherme K. Donagemma<sup>1</sup> Embrapa Soils, Rua Jardim Botânico, 1024. Jardim Botânico Rio de Janeiro, RJ

Brazil, 22460-000 Soil conservation management includes practices that help to preserve the quality of soil, water and biodiversity, promoting sustainable agriculture and ecosystem services supply. In Rio de Janeiro state, Brazil, in the region of Atlantic Forest biome, some agriculture conservation practices have been reported as capable to provide soil ecosystem services (ES) and also to increase productivity and rural income. The monitoring of the conservation practices and related ecosystem processes is essential to understand and evaluate their impacts on ecosystem services provision, as well as to subsidize conservation policies and programs. This study highlights aspects to be considered in monitoring based on a review of researches on conservation management practices in the state such as minimal tillage, crop rotation, agroforestry systems, rotational grazing and fallow. A key point concerning the monitoring of agroecosystems and their potential to provide ES is to define indicators to evaluate the impact of soil management on ecosystem services. The selection of indicators to link agroecosystems and soil ES provision requires identifying key features that represent the compositional, structural, and functional components of the system important for ecosystem services provision. The monitoring must deal with the complex dynamics of land management and ES provision in order to quantify and model them connected to ecological and soil processes in multiple spatial and temporal scales. We found that major challenges of monitoring are related to the needs of: (i) multidisciplinary studies to understand how land management affects soil ES considering the set of biotic and abiotic parameters involved, (ii) a suitable approach to analyze these parameters together, and (iii) participatory monitoring skills to promote the exchange of local stakeholders' knowledge on the ecosystems and the impacts of land management on ES. The efforts to overcome these main challenges are mandatory in order to build gathered solutions to the communities' needs concerning to the agricultural management potential to provide soil ES.

**Keywords:** soil ecosystem services assessment, soil conservation practices, participatory approach and multidisciplinary criteria

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**(8633 - 1370) Overview of methods to assess the impacts of management practices on ecosystem services to control erosion and soil loss in Latin America.**

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The land use and land cover dynamic, as well as soil and water management in agriculture can influence the amount of nutrients and sediments leached by erosion processes, jeopardizing the provision of the ecosystem services. This work aimed to identify the state of the art of methods applied in Latin America to assess management practices impacts on ecosystem services to control erosion and soil loss. For that, a bibliographic survey was done and data base was carried out, containing information on indicators and models currently used. 85 indexed articles were selected from 3.018 in the Scopus and Web of Science database (1990 to 2016). The keywords applied were: Erosion Control, Landscape, Methods, Land Use, Land Cover, Monitoring, Ecosystem Services, Indicators, Sedimentation and Latin America. The most used indicators in these studies were soil erodibility, rainfall erosion, precipitation, turbidity and flow. Among the models, there was a greater application of the USLE (30.6%), RUSLE (9.35%), MUSLE (8.5%), and SWAT (5.1%) to measure the rates of erosive potential and sediment generation (63%) under management practices. Few (6%) applied methods integrated indicators to evaluate the landscape. 75% of the studies were developed in agricultural areas. Most of them were developed in Brazil (65%), followed by Chile (5%), Costa Rica/Argentina (2.5%) and others (27.5%). This study concludes that the applied methods are similar and need to be addressed, taking into account landscape ecology, multiple scales and the provision of ecosystem

services.

**Keywords:** Erosive process, methodologies, models, indicators.

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**(1261 - 2441) Pedodiversity in Brazil: recognizing and valuation**

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Geodiversity is a concept that has been increasingly discussed by the geoscientists in this millennium. In a few words it is the abiotic equivalent of biodiversity and has been defined as the natural variety of geological (rocks, minerals, fossils), geomorphological (landforms, processes), hydrological and pedological features, including their assemblages, relationships, attributes, interpretations and systems. However, mainly in Brazil, the soil features or pedodiversity has not been recognized and valued enough in spite of its great range in the territory. This work aims to point out the high diversity of pedological heritage (soil features with different values including the scientific one) in Brazil and the importance of identifying, mapping and conserving it for the future generations. The own existence of a wide and robust Soil Classification System reveals that diversity. Considering only up to the fourth level of this System, there are 880 different kinds of soils. The role of some types of soils (ex. Nitisols) in the occupation and development of regions in Brazil, as the coffee zone in South and Southeast, and soils originated by human activities (anthrosols) in Amazonia Region are examples of the meaning of soil to our history and economy. The paleosols also can tell about past environmental conditions, reflect former human environment interactions and can guide the society to sustainable use and management. Some areas are under intensive exploitation and negative impacts due to specific soil properties as high values of sand (ex. Arenosols) by the building sector. Others (ex. Gleysols) are used as raw material to ceramics, sculptures, jewels and different kinds of art products. Besides this, soils are a live system with interactions to biological processes that are essentials to ecosystems functioning. Thus, soils can have scientific, historic, economic, ecological, educating and cultural values that need to be recognized and protected. But in the inventory carried on by the Brazilian Committee of Geological and Paleontological Sites there are 116 geosites published from several categories but there are no pedosites. These ones are very significant for science development, teaching, geotourism and even recreation activities. So, it is mandatory that pedologists and soils institutes, universities and organizations gather efforts to identify soil heritage in Brazil and defend its protection.

**Keywords:** geodiversity; pedosites; geoconservation

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**(3873 - 1754) Physical and water attributes of the soil and the water production of in hydrographic basin**

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The adequate use and management of the soil associated to the mechanical practices of soil and water conservation improves the infiltration of water in the soil, instead of runoff and, consequently, contributes to the recharge of water table, processes present in the hydrographic basin, but are not linear according to the spatial scale of the basin. Among the benefits of this land use and management suitability, there is an increase in water availability for the electrical sector from the storage of water in the soils of the reservoirs contribution basins, the recharge of the water table and the regulation of the flow of streams and rivers from the drainage network that supplies the reservoirs. Thus, the objective of this work is to quantify the environmental services in terms of production and regulation of the

water production, provided by an agricultural hydrographic basin under no-tillage since 1987, with the implanted terracing system and established riparian forest. It is a first-order basin with an area of 1.03 square kilometers, localized coordinates 24 ° 48 '59 "S and 53 ° 33' 09" W, in the region of the third plateau paranaense. The regional relief is predominantly slightly wavy to wavy. The representative topossequence of the basin consists mainly by Oxisols. In order to do so, will be characterized and quantified soil physical and water attributes (granulometry, soil water retention curve, soil density, particle density, micromorphometric analysis, hydraulic conductivity of the saturated soil, hydraulic conductivity of the unsaturated soil) and combined with the monitoring between 0 and 2 meters deep of the moisture and the total soil water potential, soil temperature and precipitation, will be characterized the subsurface vertical and lateral water flows in topossequence. The water table is also being monitored by means of wells along the topossequence and the flow of the basin by means of parshall gutter and radar type sensor. All the described variables are being monitored with a resolution time of ten minutes. To date, only partial data have been used, which indicated a time of concentration of the basin in the order of twenty minutes and the presence of subsurface flows, both vertical and lateral. For medium intensity rains there is a trend of infiltration values higher than the surface runoff.

**Keywords:** hydrographic basin; water production; environmental soil functions

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**(8465 - 715) Potential of agroecosystem services. The case of Slovakia.**

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Applying the mapping of agroecosystem services potential appropriately can help to show the possibilities of regional sustainable land use management as well as trade-offs between different ecosystem services. For evaluation of agroecosystem services potential in Slovakia, we have created a mapping unit by combination of four input layers (slope topography, climate units, soil texture and land use) with the use of tools offered by geographic information systems. In Slovakia 29.14% of agricultural land has very high potential for provisioning services, 27.47% of agricultural ecosystems has very high potential for water regime regulation of and 92% agroecosystems have a high to very high potential for water erosion regulation. Out of the total Slovak land used in agriculture 41.67% of ecosystems have very high potential for soil purification, they are mainly ecosystems of arable land with high carbonate content without anthropogenic and geochemical deposition. The percentage distribution results of various categories for climate regulations potential (sequestration of organic carbon in the soil) are significantly influenced by the ecosystems of arable land due to the high share of area of these ecosystems to the total area of agricultural land. The capacity of ecosystems to provide recreational services depends on the particular uniqueness of the site, its accessibility and the surrounding infrastructure. Agroecosystems of arable land have predominantly very low (50.7 %) to low potential (15.7%) and permanent grasslands have high and very high potential of natural conditions for recreation (53.82%). Ecosystem services are non-linearly linked and changes in one service influence the other in positive or negative way. High potential of provisioning service is linked to the high potential of water regime regulation, pollutants filtration and soil erosion. The opposite trend has the potential provisioning services to potential of climate regulation and potential of natural conditions for recreation. The synergistic effect is between the provisioning agroecosystem service, regulation of water regime and soil purification. Climate has the most significant impact on agroecosystem services. Warm, dry and lowland regions have higher potential of provisioning services, regulation of water regime, filtration of pollutants and control of soil erosion in comparison to moderately warm and cold regions.