

International Multidisciplinary Scientific GeoConference

Surveying **G**eology & mining **E**cology **M**anagement

DBPapers

SGEM Scientific Papers DataBase - © OnLine resources of the International SGEM GeoConferences

GEOLOGY

HYDROGEOLOGY,
ENGINEERING GEOLOGY
AND GEOTECHNICSEXPLORATION AND
MINING

MINERAL PROCESSING

APPLIED AND
ENVIRONMENTAL
GEOPHYSICSOIL AND GAS
EXPLORATION

INFORMATICS

GEOINFORMATICS

GEODESY AND MINE
SURVEYINGPHOTOGRAMMETRY
AND REMOTE SENSINGCARTOGRAPHY AND
GISHYDROLOGY AND
WATER RESOURCES

SOILS

FOREST ECOSYSTEMS

[Papers SGEM2009](#)[Papers SGEM2010](#)[Papers SGEM2011](#)[Papers SGEM2012](#)[Papers SGEM2013](#)[Papers SGEM2014](#)[Papers SGEM2015](#)[Papers SGEM2016](#)[Papers SGEM2017](#)[Papers SGEM2018](#)MARINE AND OCEAN
ECOSYSTEMSNUCLEAR
TECHNOLOGIESRENEWABLE ENERGY
SOURCES AND CLEAN
TECHNOLOGIES

RECYCLING

AIR POLLUTION AND

[Home](#) > [FOREST ECOSYSTEMS](#) > [Papers SGEM2018](#)

THEORETICAL MODELS FOR RUT DEPTH EVALUATION AFTER A FORESTRY MACHINE'S WHEEL PASSOVER

A. KOCHNEV, E. KHITROV
Thursday 11 October 2018 by Libadmin2018

ABSTRACT

The paper presents a mathematical model designed to calculate the depth of the rut formed by a small-sized skidder on soft soils. The model bases on scientific research in the theory of off-the-road locomotion, completed with the authors' own theoretical developments. The model uses deformation modulus and bearing capacity as integral characteristics of strength and deformability of the soil. Moreover, because the deformation modulus of soft soils has a low value and is comparable to the normal stresses, the model uses a refined dependence for linking the soil deformation and the load parameters. Other physical and mechanical properties of the soil expressed in terms of its modulus, the expressions obtained as a result of the reference data approximation. The developed mathematical model uses refined formula to account the relationship of tire deflection of small-sized skidder and the soil deformation. The formula allows taking into account the fact that, ceteris paribus on soft soils deformation of the tire is smaller in value than the tire deformation on stronger soils. The model also takes into account the deviation of the direction of load resulting from the normal to the surface of soil and translational speed of the mover. This is achieved by introducing into the formulae for calculation of the bearing capacity correction factor on the direction of the load and the dynamic coefficient, calculated using the soil's rheological parameter in calculating the average pressure on the contact patch of soil with the mover. The model is implemented numerically in the software package Maple 2015. As a result of the calculated data approximation obtained a simplified model to estimate the depth formed on the soft soils under the influence of the small-sized skidder's mover.

Keywords: soft soil, forest soil, peatland soil, wheel interaction, small-sized skidder, rutting, deformation modulus

[Libadmin2018](#)

Articles by this author

- [PAPER. CRAFT AND INDUSTRY. SOCIAL SUSTAINABILITY AND CULTURAL HERITAGE](#)
- [ROLE OF CULTURAL BUILDINGS IN THE CITY](#)
- [SIGNS ON MEGALITHS IN THE ENVIRONS OF ELVA AND EVORA IN PORTUGAL](#)
- [SPATIAL DEVELOPMENT CITY MODELS IN TRANSPORT SUSTAINABLE MOBILITY ISSUE](#)
- [COMFORT AND COHESION IN OUTDOOR AND SEMI OUTDOOR SPACES IN SANLIURFA TRADITIONAL ARCHITECTURE, TURKEY](#)
- [...]

Also in this section

[MAIN REGULATIONS AND STANDARDS CONCERNING THE PROTECTION OF FORESTS AND VINICULTURAL PLANTATIONS FROM ROMANIA, WITH A SPECIAL FOCUS ON IMPROVING THE EFFECTS CAUSED BY CLIMATIC CHANGES](#)

[MONITORING AND COMPARATIVE ANALYSIS OF LAND USE CHANGES ON THE EXAMPLE FOREST REGION OF FINLAND](#)

[PICEA PHYSOKERMES SCHRNK. DAMAGE IMPACT TO PICEA ABIES \(L.\) H. KARST DIAMETER INCREMENT IN MYRTILLOSA MEL.](#)

[POTENTIAL OF HYBRID LARCH \(LARIX X EUROLEPIS\) IN FOREST REGENERATION IN LATVIA](#)

[PREDICTING POTENTIAL DISTRIBUTION OF ORCHIS GALILAEA IN LEBANON USING GEOGRAPHIC INFORMATION SYSTEM](#)

[STRUCTURE OF SOME STANDS INSTALLED ON TAILINGS DUMPS: CASE STUDY FROM MOLDOVA NOUA, ROMANIA](#)

[STUDY OF HYDRODYNAMIC RESISTANCE OF A RAFT COMPOSED OF THE FLAT RAFTING UNITS OF VARIOUS DRAFT](#)

[REMOTE SENSING MEANS FOR THE ANALYSIS OF CHANGES OF FOREST FIELD LIMITS AND THEIR IMPACT ON](#)