

الخاتمة

تعتبر الغابات مساحات من الأرض غنية بالحياة النباتية وخصوصاً بالأشجار الكثيفة. وتعتبر عنصراً أساسياً من عناصر البيئة ولها تأثير مباشر على صحة الإنسان والبيئة.

لا يعلم الكثير منا أن الغابات لها تأثيرات كثيرة على كل شيء من حولنا. إن قطع الأشجار و الحرائق من مسببات إزالة الغابات التي بدورها تؤثر سلباً على حياة الكائنات الموجودة فيها.

إن الأشجار والغابات نعمة من الله علينا أمدنا بها لما لها من منافع كثيرة على جميع الكائنات، فهناك من الكائنات من يعتمد عليها اعتماداً كلياً في العيش، فلنحافظ عليها لتعيش جميع الكائنات فيها بسلام.

التوصيات

- الاهتمام بترجمة الكتب العلمية من الإنجليزية للعربية لتعم الفائدة على البشر.
- الاهتمام بالغابات و المحافظة عليها لما لها من تأثيرات على البيئة.
- مواصلة ترجمة ما تبقى من فصول بهذا الكتاب لما له من فائدة علمية كبيرة.
- توعية الطلبة بأهمية الغابات في البيئة.
- تشجيع طلبة الترجمة على ترجمت مثل هذه الكتب التي تحتاج إليها الكليات والجامعات والطلبة والباحثين والدارسين أيضاً في مجالاتهم المختلفة.

الملحق

الرموز المستخدمة ومعانيها

A	منطقة
a	المنطقة المستعرضة; الارتفاع
B	الضغط البارومتري في الارتفاع الفعلي
B ₀	الضغط البارومتري عند مستوى البحر
C	ثابت; مُعامل الجريان السطحي; تسرب الحرارة من خلال جدران الصهاريج; مؤوي
D	قطر; عمق التربة
D _s	عمق الثلج
d	عمق المياه; مكافئة مياه الثلج
E	التبخّر, عمق المياه
e	ضغط التبخر
e_a	ضغط التبخر, الفعلي أو التشبع عند t من نقطة الندى
e_s	ضغط التبخر المشبع
e_w	المشبع e عند t من سطح المياه
F	الغابة; فهرنهايت; الارتشاح الكلي
f	معدل الارتشاح
G	الترسب في التوزيع أو المادة المتآكلة
g	سرعة الجاذبية
H _a	الرطوبة المطلقة
H _d	نقص التشبع
H _q	الرطوبة المعيَّنة

H_r الرطوبة النسبية
 h الارتفاع
 I الاعتراض
 I_t مؤشر الاضطراب
 i كثافة سقوط المطر
 K or k ثابت
 L حرارة كامنة من تبخر المياه
 l الطول أو المسافة
 h اطول التدفق البري
 M محتوى الرطوبة
 M_e الرطوبة المكافئة
 M_p % قياس M بالوزن
 M_f سعة رطوبة الحقل
 M_v قياس % M بالحجم
 M_w نقطة الذبول
 m خط الانحدار
 n مُعَامِل الخشونة
 O مكشوفة
 P هطول المطر
 P_e زيادة هطول المطر
 P_s هطول المطر لكل shower
 p حدود خارجية مبلة, اختلاف الضغط
 Q التدفق في الحجم لكل وحدة زمنية
 Q_g تدفق المياه الجوفية أو التغلغل
 Q_s الجريان السطحي الكُلِّي أو التراكمي
 q_s معدل الجريان السطحي

R إشعاع شمسي

Rb إشعاع خلفي

r نصف القطر; نصف القطر الهيدروليكي; معدل التغذية

S تخزين; حرارة مخزنة في وحدة زمنية في عمود وحدة منطقة والعمق

s انحدار الأرض أو القناة

T عمق النتج

t درجة الحرارة; الزمن

ta درجة حرارة الهواء

tw درجة حرارة المياه

t' درجة حرارة بلل البوصيلة

V الحجم

v السرعة

W الوزن

w العرض

X تسرب عميق غير معروف

x الطول; أفقي

y عائد محدد

δ الاحتفاظ السطحي

e قاعدة لوغارثيم الطبيعية

η مُعامل اللزوجة

ρ الكثافة

ρa الكثافة الظاهرة أو حجم الوزن

ρs كثافة الثلج

Reference

- ALDERFER, R. B., and F. G. MERKLE: Structural- (4) -1
 stability and permeability of native forest soils compared
 with cultivated areas of the same soil type, Proc. Soil Sci.
 .(Soc. Am., 6:98- 103 (1941
- AREND, J. L.: Infiltration rates of forest soils in the - (15) -2
 Missouri Ozarks as affected by woods burning and litter
 .(removal, J. Forestry, 39: 726- 728 (1941
- ARTHUR, J. M., and W. D. STEWART: Transpiration of - (16) -3
 tobacco plants in relation to radiant energy in the visible
 and infra-red, Contrib. Boyce Thompson Inst., 5:489 - 501
 .((1933
- AUGUSTINE, M. T.: Infiltration runs on frozen ground, -(18) -4
 .(Proc. Sci. Soc. Am., 6: 435 (1941
- AUTEN, J. T.: The effect of forest burning and - (19) -5
 pasturing in the Ozarks on the water absorption of forest
 soils, U. S. Forest Serv., Central States Forest Expt. Sta.
 .Note 16 (1934). Mimeo
- Porosity and water absorption of forest soils, J.-_____:((20) -6
 .(Agr. Research, 46: 997- 1014 (1933
- AYRES, Q. C.: "Soil Erosion and Its control," McGraw- -(23) -7
 .(Hill Book Company Inc., New York (1936

- BAKER, D. M., and H CONKLING:" Water Supply and -(28) -8
 .(Utilization," John Wiley & Sons, Inc., New York (1930
- BAKER, F. S. : some field experiments upon -(29) -9
 evaporation from snow surfaces Monthly Weather Rev.,
 .(45: 363- 366 (1917
- The Theory and Practice of Silviculture," : _____ -(30) -10
 .(McGraw- Hill Book Company, Inc., New York (1934
- BARNES, B. S.: Fluctuation of ground water flow, -(31) -11
 .(Proc. Cent. Snow Conf., 1: 174-175 (1942
- BARRETT, L. I.: Water in its relation to forestry, pp -(32) -12
 16-18 in "Michigan's Water Problems," Water Conserv.
 .(Conf., Lansing, Mich. (1944
- BATES, C. G.: Physiological requirements of Rock -(35) -13
 .(Mountain trees, J. Agr. Research 24: 97- 164 (1923
- and A. J. HENRY: Forest and streamflow at _____ -(37) -14
 Wagon Wheel Gap, Colorado. Final report. Monthly
 .(Weather Rev. Suppl., 30: 1-79 (1928
- and O. R. ZEASMAN: Soil erosion- a local and _____ -(39) -15
 national problem, Wisc. Agr. Expt. Sta. Research Bull. 99
 .((1930
- BAUER, H. L.: Moisture relations in the chaparral of -(40) -16
 the Santa Monica Mountains, California, Ecol. Monographs,
 .(6: 409- 454 (1936
- BENNETT, H. H.: Relation of erosion to vegetative -(46) -17
 .(changes, Sci. Monthly, 35:385- 415 (1932

- Soil Conversation," McGraw-Hill Book" :_____ -(47) -18
 .(Company, Inc., New York, (1939
- BIALOGLOWSKI, J. : Effect of Humidity on Transpiration)-48(-19
 of Rooted Lemon Cuttings under Controlled Conditions,
 .)Proc. Am. Soc. Hort. Sci., 33: 166 – 169 (1936
- BILLINGS, W. D.: The structure and the development -(49) -20
 of old shortleaf pine stands and certain associated
 physical properties of soil, Ecol. Monographs, 8: 437- 499
 .((1938
- BRATER, E. F.: The Unit hydrograph principle applied -(52) -21
 to small watersheds, Proc. Am. Soc. Civil Engrs., 65:1191-
 .(1215 (1939
- BURGER,H.: Influence du pasturage sur l'écoulement -(65) -22
 .(des eaux et l'érosion, J. Forest. Suisse, 83:97- 102 (1932
- Der :_____ -(66) -23
 Kronenaufbaugleichalteriger Nadelholzbestände, Mitt.
 .(Schweiz. Anstaltforstl. Versuchsw., 21: 5- 57 (1939
- Die transpiration unserer Waldbäume, Z. :_____ -(67) -24
 .(Forst. u. Jagdw., 57:473-82 (1925
- COOK, H. L., and F. B. CAMPBELL: Characteristics of -(96) -25
 some meadow strip vegetations, Agr. Eng., 20:345-348
 .((1939
- COOPER, W. S.: The broad sclerophyll vegetation of -(98) -26
 .(California, Carnegie Inst. Wash. Pub., 319: 1- 124 (1922

- COPELAND, E. B.: Transpiration by chaparral and its effect upon the temperature of leaves, Univ. Calif. Pub. (Botany, 17: 1-21 (1932) -27
- COSTER, C. H.: The transpiration of various types of vegetation on Java (Dutch with English summary), (Tectona, 30: 1- 124 (1937) -28
- CRADDOCK, G. W., and C. K. PEARSE: Surface runoff and erosion on granitic mountain soils of Idaho as influenced by range cover, soil disturbance, slope, and precipitation intensity, U.S. Dept. Agr. Circ. 482 (1938) -29
- DAY, G. M.: Topsoil changes in coniferous plantations, J. Forestry, 38:646-649 (1940) -30
- ENGLER, A.: Research on the influence of the forest upon the disposition terrestrial and atmospheric waters, U.S. Forest Serv., Div. Silvics., Trans. 100, mimeo, Original (in German (1919) -31
- FOSTER, E. E.: The effects of bedrock on runoff of Wisconsin streams, Proc. Eng. Soc. Wis., 162 (1926) -32
- FREE, G. R., G. M. BROWNING, and G. W. MUSGRAVE: Relative infiltration and related physical characteristics of certain soils, U.S. Dept. Agr. Tech. Bull. (729 (1940) -33
- HENDRICKS, B. A.: Effect of grass litter on infiltration of rainfall on granitic soils in a semi-desert shrub grass area, U.S. Forest Serv., Southwestern Forest (and Range Expt. Sta. Research Note 96 (1942) -34

- HENDRICKSON, B. H.: The choking of pore-space in -(150) -35
the soil and its relation to runoff and erosion, Trans. Am.
. (Geophys. Union, Part II:500-505 (1934
- HOLCH, A. E.: Development of roots and shoots of -(156) -36
certain deciduous tree seedlings in different forest sites,
. (Ecology, 12: 259-299 (1924
- HOOVER, M. D.: Effect of removal of forest -(158) -37
vegetation upon water yields, Trans. Am. Geophys. Union,
. (Part VI:969-975 (1944
- HORTON, R. E.: Analysis of runoff plot experiments -(160) -38
with varying infiltration- capacity, Trans. Am. Geophys.
. (Union, Part IV :693-711 (1939
- An approach toward a physical interpretation: _____-(161) -39
of infiltration – capacity Proc. Soil . Soc. Am., 5:399-418
. ((1940
- Determination of infiltration – capacity for: _____ -(162) -40
large drainage basins, Trans. Am. Geophys. Union, Part
. (II:371-385 (1937
- The interpretation application of runoff plot: _____-(164) -41
experiments with reference to soil erosion problems, Proc.
(Soil Sci. Soc. Am., 3:340-349(1938
- Surface run-off control, Chap, 11 of: _____-(170) -42
"Headwaters control and Use," Upstream Eng. Conf.,
. (Washington, D.C. (1937

Analysis ____ Surface run-off phenomena. Part:____-(171)	-43
of the hydrograph, Horton Hydrological Lab. Pub. 101	
.(1935). 73 pp	
Transpiration by forest trees, Monthly Weather :____-(172)	-44
.(Rev., 51:571-581 (1923	
HOYT, W.G., and others: Studies of relations of-(176)	-45
rainfall and runoff in the United States, U.S. Geol. Survey,	
.(Water Supply Paper 772 (1936	
HURSH, C. R. and P. W. Fletcher: the soil profile as a-(182)	-46
) 486 __natural reservoir, Proc. Soil Sci. Soc. Am., 7:480	
.(1942	
ISRAESEN, O. W.: "Irrigation Principles and -(183)	-47
Practices, "John Wiley & Sons, Inc., New York (1932). 422	
.pp	
JOHNSON, W. M.: Infiltration capacity of forest soil -(190)	-48
.(as influenced by litter, J. Forestry, 38:520 (1940	
KING, H. W.: "Handbook of Hydraulics, "3d ed., -(196)	-49
McGraw-Hill Book Company, Inc., New York (1939). 617	
.pp	
KITTREDGE, J.: Estimation of the amount of foliage-(199)	-50
.(of trees and stands, J. Forestry, 42:905-912 9 (1944	
Forest and Water: aspects which have :____-(201)	-51
.(received little attention, J. Forestry, 34:417-419 (1936	
The magnitude and regional distribution of :____ -(202)	-52
water losses influenced by vegetation, J. Forestry, 36:775-	
.(778 (1938	

- KOHNKE, H.: A method for studying infiltration, Proc. -(205) -53
 .(Soil Sci. Soc. Am. 3:296-303 (1938
- LAWS, J. O.: Recent studies in raindrops and erosion, -(214) -54
 .(Agr. Eng., 21:431-433 (1940
- LEE, C. H.: Total evaporation for Sierra Nevada -(216) -55
 watershed by the method of precipitation and runoff
 differences, Trans. Am. Geophys. Union, Part I :50-66
 .((1941
- Water supply from rainfall on valley floors, :_____ -(217) -56
 .(Discussion, Proc. Am. Soc. Civil Engrs., 56:787-800 (1930
- LOWDERMILK, W. C.: Influence of forest litter on -(225) -57
 run-off, percolation and erosion, J. Forestry, 28:474-491
 .((1930
- and P. B. ROWE: Still further studies on _____ -(226) -58
 absorption of rainfall in its relation to surficial runoff and
 erosion, Trans. Am. Geophys. Union, Part II : 509-515
 .((1934
- MARTIN, E. V.: Studies of evaporation and -(240) -59
 transpiration under controlled conditions, Carnegie Inst.
 .(Wash. Pub. 550 (1943
- Effect of solar radiation on transpiration of :_____ -(241) -60
 .(Helianthus annuus, Plant Physiol., 10:341-354 (1935
- MEAD, D. W.: "Elements of Hydrology," McGraw-Hill -(243) -61
 .Book Company, Inc., New York (1919). 647 pp

- MEGINNIS, H. G.: Effect of cover on surface run-off-(245) -62
and erosion on the loessial uplands of Mississippi, U.S.
.(Dept. Agr. Circ. 347 (1935
- MEINZER, O. E., and others: "Hydrology," Natl. Res. -(249) -63
Council. Physics of the Earth Series, Vol. IX, McGraw-Hill
.(Book Company, Inc., New York (1942
- MEYER, A. F.: "The Element of Hydrology," John -(251) -64
.(Wiley & Sons, New York, 2d ed., 1928. 522 pp
- MEYER, B. S.: The daily periodicity of transpiration of-(252) -65
.(tulip poplar, Ohio Jour. Sci., 32:104-114 (1932
- MINCKLER, L. S.: Transpiration of trees and forests, -(255) -66
.(J. Forestry, 37:336-339 (1939
- MITCHELSON, A. T. and D. C. MUCKEL: Spreading-(257) -67
water for storage underground, U.S. Dept. Agr. Tech. Bull.
.(578 (1937
- MINNS, E. N. and I. H. SIMS: Forests in flood control;-(266) -68
supplemental report to the Committee on Flood Control,
House of Representative, 74th Congr., 2d Sess., on H. B.
.(12517. U.S. Forest Serv. (1936
- and G. R. FREE: Preliminary report on____-(269) -69
determination of comparative infiltration- rates on some
major soil- types, Trans. Am. Geophys. Union, Part II: 345-
.(349 (1938
- PEARSE, C. K. and S. B. WOOLLEY: The influence of-(281) -70
range plant cover on the rate of absorption of surface
.(water by soils, J. Forestry, 34:844-847 (1937

- PEARSON, G. A.: Studies in transpiration of-(283) -71
 .(coniferous tree seedlings, Ecology, 5:340-347 (1924
- PICKELS, G. W.: Runoff investigation in central-(286) -72
 .(Illinois, Univ. Illinois Eng. Expt. Sta. Bull. 232 (1931
- RABER, O.: Water utilization by trees, with special -(291) -73
 reference to the economic forest species of the North
 .(Temperate Zone, U.S. Dept. Agr. Misc. Pub. 257 (1937
- ROWE, P. B.: The construction, operation, and use -(299) -74
 of the North Fork infiltrometer, *U.S. Flood Control Coord.*
Com. Misc. Pub. 1, Calif. Forest and Range Expt. Sta. Misc.
.(Pub. 1 (1940
- A method of hydrological analysis in :____-(300) -75
 watershed- management, Trans. Am. Geophys. Union, Part
 .(II: 632-650 (1943
- Some factors of the hydrology of the Sierra :____-(301) -76
 Nevada foothills, Trans. Am. Geophys. Union, Part I: 90-
 .(100 (1941
- D. M. ILCH, and R. BOLLAERT: An infiltration ,____-(302) -77
 study of a denuded and a forest covered soil, *U.S. Forest*
Serv., Calif. Forest and Range Expt. Sta., Research Note 14
 .((1937
- SHAPIRO, A. A., and H. DE FOREST: A comparison of -(314) -78
 transpiration rates in chaparral, Ecology, 13: 290- 295
 .((1932
- SHAW, C. F.: The normal moisture capacity of soils,-(316) -79
 .(Soil Sci., 23:303-317 (1927

- SINCLAIR, J. D. and A. W. SAMPSON: Establishment-(324) -80
and succession of vegetation on different soil horizons,
.(Hilgardia, 5:155-174 (1931
- SMITH, H. L., and L. B. LEOPOLD: Infiltration studies -(325) -81
in the Pecos River watershed, New Mexico and Texas, Soil
.(Sci., 53:195-204 (1942
- SMITH, R. M., and D. R. BROWNING: Persistent water-(327) -82
-un saturation of natural soil in relation to various soil and
.(plant factors, Proc. Soil Sci. Soc. Am., 7:114-119 (1942
- STEWART, G. R.: A study of soil changes associated-(331) -83
with transition from fertile hardwood forest land to pasture
types of decreasing fertility, Ecol. Monographs, 3:107-145
..((1933
- STICKEL, P. W.: The measurement and interpretation-(332) -84
of forest-fire weather in the Western Adirondacks, N. Y.
.(State Col. Forestry Tech. Pub. 34 (1931
- TAYLOR, C. A.: Transpiration and evaporation losses-(339) -85
from areas of native vegetation, Trans. Am. Geophys.
.(Union, Part II: 554-559 (1934
- THOM, C. C., and H. F. HOLTZ: Factors influencing-(340) -86
the water requirement of plants, Wash. Agr. Expt. Sta.
.(Bull.146 (1917
- THORNTHWAITE, C. W.: Atmospheric turbulence and -(341) -87
the measurement of evaporation, Proc. Second Hydraulics
.(Conf., Iowa Univ. Studies, Eng. Bull. 27 (1943

- and B. HOLZMAN: Measurement of evaporation____-(342) -88
from land and water surfaces, U.S. Dept. Agr. Tech. Bull.
. (817 (1942
- TROXELL, H.C.: The diurnal fluctuation in the ground -(347) -89
water and flow of the Santa Ana River and its meaning,
. (Trans. Am. Geophys. Union, Part II: 496- 504 (1936
- U.S Forest Service: "Handbook of Erosion Control -(350) -90
Engineering on the National Forest," Government Printing
. (Office, Washington, D. C. (1936
- U.S. National Research Council: "Law Dams," -(354) -91
Government Printing Office, Washington, D. C. (1938). 431
.pp
- VEIHMEYER, F. J., and A. H. HENDRICKSON: The -(358) -92
relation of soil moisture to cultivation and plant growth,
. (Proc. First Intern. Congr. Soil Sci., 1927, 3:498-513 (1928
- WAHLENBERG, W. G.: Effect of Ceanothus brush on -(359) -93
western yellow pine plantations in the North Rocky
. (Mountains, J. Agr. Research, 41:601-612 (1930
- WILM, H. G.: The application and measurement of-(365) -94
artificial rainfall on types FA and F infiltrimeters, Trans.
. (Am. Geophys. Union, Part II: 480-486 (1943
- Methods for measurement of infiltration, :____-(368) -95
. (Trans. Am. Geophys. Union, Part III : 678-686 (1941
- WOODWARD, L.: Infiltration-capacities of some -(378) -96
plant-soil complexes on Utah range watershed-lands,
. (Trans. Am. Geophys. Union, Part II: 486-474 (943

ZON, R.: Forest and water in the light of scientific -(381) -97
investigation, U.S. Nat. Waterways Comm. Final Rpt., App.
. (V:205-302, 62d Congr., 2d Sess., Sen. Doc. 469 (1927