



Trends.Earth - General Information

Release 2.1.8

Conservation International


Feb 06, 2023

CONTENTS

1	Contacting the team	2
2	Authors	3
3	Acknowledgements	4
4	Citation	5
5	License	6
6	Trademark	7
7	Publications	8
7.1	Peer-reviewed Publications	8
7.2	Academic dissertations	10
7.3	Other resources	10

▲TRENDS.EARTH was produced as part of the project “Enabling the use of global data sources to assess and monitor land degradation at multiple scales”, funded by the Global Environment Facility.

CONTACTING THE TEAM

Contact the [Trends.Earth](#) team with any comments or suggestions. If you have specific bugs to report or improvements to the tool that you would like to suggest, you can also submit them in the [issue tracker on Github](#) for TRENDSEARTH.

AUTHORS

The Land Degradation Monitoring Project is a partnership of Conservation International, Lund University, and the National Aeronautics and Space Administration (NASA), and is funded by the Global Environment Facility (GEF).

Contributors to the documentation and to **▲TRENDS.EARTH** include Yengoh Genesis, Lennart Olsson, Mariano Gonzalez-Roglich, Monica Noon, Tristan Schnader, Anna Tengberg, and Alex Zvoleff.



▲TRENDS.EARTH uses [Google Earth Engine](#) to compute indicators in the cloud.

Google Earth Engine

The **Tools4LDN** Project is a partnership of Conservation International, University of Bern, University of Colorado in partnership with USDA and USAID, University of California - Santa Barbara in partnership with University of North Carolina - Wilmington and Brown University and is funded by the Global Environment Facility (GEF).

Contributors to the documentation and to **▲TRENDS.EARTH** include Gabriel Daldegan, Mariano Gonzalez-Roglich, Monica Noon, and Alex Zvoleff in partnership with Jeff Herrick, Tatenda Lemann, Hanspeter Liniger, David Lopez-Carr, Kevin Mwenda, Jason Neff, George Peacock, Narcisca Pricope, Sanna Sokolow, and Ingrid Teich.

ACKNOWLEDGEMENTS

The feedback provided by early users of **▲TRENDS.EARTH** and by the participants in the webinars and workshops held by the GEF Land Degradation Monitoring Project have been critical to the development of the tool.

Neil Sims, Sasha Alexander, Renato Cumani, and Sara Minelli provided input on the implementation of the SDG 15.3 and LDN indicators in **▲TRENDS.EARTH**, on the structure of the tool, and on the UNCCD reporting process, and also provided early input and testing of the tool.

The project acknowledges the participants of the workshop held in Morogoro, Tanzania in October, 2017 for sharing their feedback and suggestions on the tool: Jones Agwata, Col. Papa Assane Ndiour, Lt. Fendama Baldé, Papa Nékhou Diagne, Abdoul Aziz Diouf, Richard Alphonse Giliba, Moses Isabirye, Vettes Kalema, Joseph Kihale, Prof. D.N. Kimaro, James Lwasa, Paulo Mandela, Modou Moustapha Sarr, Joseph Mutyaba, Stephen Muwaya, Joseph Mwalugelo, Prof. Majaliwa Mwanjalolo, Edson Aspon Mwijage, Jerome Nchimbi, Elibariki Ngowi, Tabby Njunge, Daniel Nkondola, Blaise Okinyi, Joseph Opio, Rozalia Rwegasira, Ndeye Kany Sarr, Mamadou Adama Sarr, Edward Senyonjo, Olipa Simon, Samba Sow, Felly Mugizi Tusiime and John Wasige.

CITATION

If you wish to cite ▲TRENDS.EARTH, please use the following citation:

Trends.Earth. Conservation International. Available online at: <http://trends.earth>. 2022.

LICENSE

▲TRENDS.EARTH is free and open-source. It is licensed under the [GNU General Public License, version 2.0 or later](#).

This site and the products of ▲TRENDS.EARTH are made available under the terms of the [Creative Commons Attribution 4.0 International License \(CC BY 4.0\)](#). The boundaries and names used, and the designations used, in ▲TRENDS.EARTH do not imply official endorsement or acceptance by Conservation International Foundation, or its partner organizations and contributors.

TRADEMARK

▲TRENDS.EARTH has a service mark trademark registered June 9, 2020 (reg. No. 6,074,442 and Int. Cl.: 9,35,42) by the United States Patent and Trademark Office.

PUBLICATIONS

7.1 Peer-reviewed Publications

The below peer-reviewed publications either use or relate to [TRENDS.EARTH](#).

- Alamanos, A. and Linnane, S., 2021. Estimating SDG Indicators in Data-Scarce Areas: The Transition to the Use of New Technologies and Multidisciplinary Studies. *Earth*, 2(3), pp.635-652.
- Dong, J., Metternicht, G., Hostert, P., Fensholt, R., Chowdhury, R.R., 2019. Remote sensing and geospatial technologies in support of a normative land system science: status and prospects. *Curr. Opin. Environ. Sustain.* 38, 44–52. <https://doi.org/10.1016/j.cosust.2019.05.003>
- Easdale, M.H., Fariña, C., Hara, S., Pérez León, N., Umaña, F., Tittonell, P., Bruzzone, O., 2019. Trend-cycles of vegetation dynamics as a tool for land degradation assessment and monitoring. *Ecol. Indic.* 107, 105545. <https://doi.org/10.1016/j.ecolind.2019.105545>
- Giuliani, G., Chatenoux, B., Benvenuti, A., Lacroix, P., Santoro, M., Mazzetti, P., 2020a. Monitoring land degradation at national level using satellite Earth Observation time-series data to support SDG15 – exploring the potential of data cube. *Big Earth Data* 4, 3–22. <https://doi.org/10.1080/20964471.2020.1711633>
- Giuliani, G., Mazzetti, P., Santoro, M., Nativi, S., Van Bemmelen, J., Colangeli, G., Lehmann, A., 2020b. Knowledge generation using satellite earth observations to support sustainable development goals (SDG): A use case on Land degradation. *Int. J. Appl. Earth Obs. Geoinformation* 88, 102068. <https://doi.org/10.1016/j.jag.2020.102068>
- Gonzalez-Roglich, M., Zvoleff, A., Noon, M., Liniger, H., Fleiner, R., Harari, N., Garcia, C., 2019. Synergizing global tools to monitor progress towards land degradation neutrality: Trends.Earth and the World Overview of Conservation Approaches and Technologies sustainable land management database. *Environ. Sci. Policy* 93, 34–42. <https://doi.org/10.1016/j.envsci.2018.12.019>
- Jiang, L., Bao, A., Jiapaer, G., Liu, R., Yuan, Y. and Yu, T., 2022. Monitoring land degradation and assessing its drivers to support sustainable development goal 15.3 in Central Asia. *Science of The Total Environment*, 807, p.150868. <https://doi.org/10.1016/j.scitotenv.2021.150868>
- Kadaverugu, A., Nageshwar Rao, C. and Viswanadh, G.K., 2021. Quantification of flood mitigation services by urban green spaces using InVEST model: a case study of Hyderabad city, India. *Modeling Earth Systems and Environment*, 7(1), pp.589-602. <https://doi.org/10.1007/s40808-020-00937-0>
- Kust, G.S., Andreeva, O.V., Lobkovskiy, V.A., 2020. Land Degradation Neutrality: the Modern Approach to Research on Arid Regions at the National Level. *Arid Ecosyst.* 10, 87–92. <https://doi.org/10.1134/S2079096120020092>
- Hu, Y., Wang, C., Yu, X. and Yin, S., 2021. Evaluating Trends of Land Productivity Change and Their Causes in the Han River Basin, China: In Support of SDG Indicator 15.3. 1. *Sustainability*, 13(24), p.13664. <https://doi.org/10.3390/su132413664>

- Li, Z., Lun, F., Liu, M., Xiao, X., Wang, C., Wang, L., Xu, Y., Qi, W., Sun, D., 2021. Rapid diagnosis of agricultural soil health: A novel soil health index based on natural soil productivity and human management. *J. Environ. Manage.* 277, 111402. <https://doi.org/10.1016/j.jenvman.2020.111402>
- Liniger, H., Harari, N., van Lynden, G., Fleiner, R., de Leeuw, J., Bai, Z., Critchley, W., 2019. Achieving land degradation neutrality: The role of SLM knowledge in evidence-based decision-making. *Environ. Sci. Policy* 94, 123–134. <https://doi.org/10.1016/j.envsci.2019.01.001>
- Mariathasan, V., Bezuidenhout, E., Olympio, K.R., 2019. Evaluation of Earth Observation Solutions for Namibia's SDG Monitoring System. *Remote Sens.* 11, 1612. <https://doi.org/10.3390/rs11131612>
- Mazzetti, P., Nativi, S., Santoro, M., Giuliani, G., Rodila, D., Folino, A., Caruso, S., Aracri, G. and Lehmann, A., 2022. Knowledge formalization for Earth Science informed decision-making: The GEOEssential Knowledge Base. *Environmental Science & Policy*, 131, pp.93-104. <https://doi.org/10.1016/j.envsci.2021.12.023>
- Meyer, D. & Riechert, M. Open source QGIS toolkit for the Advanced Research WRF modelling system. *Environmental Modelling & Software* 112, 166–178 (2019). <https://doi.org/10.1016/j.envsoft.2018.10.018>
- Moussa, S., El Brirchi, E.H. and Alami, O.B., 2022. Monitoring Land Productivity Trends in Souss-Massa Region Using Landsat Time Series Data to Support SDG Target 15.3. In *Geospatial Intelligence* (pp. 119-129). Springer, Cham. https://doi.org/10.1007/978-3-030-80458-9_9
- Ogorodnikov, S.S., 2021, March. Land Degradation Neutrality in the Tula region. In *IOP Conference Series: Earth and Environmental Science* (Vol. 723, No. 4, p. 042053). IOP Publishing. doi:10.1088/1755-1315/723/4/042053
- Prakash, M., Ramage, S., Kavvada, A., Goodman, S., 2020. Open Earth Observations for Sustainable Urban Development. *Remote Sens.* 12, 1646. <https://doi.org/10.3390/rs12101646>
- Philip, E., 2021. Coupling Sustainable Development Goal 11.3. 1 with current planning tools: city of Hamilton, Canada. *Hydrological Sciences Journal*, 66(7), pp.1124-1131. <https://doi.org/10.1080/02626667.2021.1918340>
- Reith, J., Ghazaryan, G., Muthoni, F. and Dubovyk, O., 2021. Assessment of Land Degradation in Semiarid Tanzania—Using Multiscale Remote Sensing Datasets to Support Sustainable Development Goal 15.3. *Remote Sensing*, 13(9), p.1754. <https://doi.org/10.3390/rs13091754>
- Rowe, H.I., Gruber, D. and Fastiggi, M., 2021. Where to start? A new citizen science, remote sensing approach to map recreational disturbance and other degraded areas for restoration planning. *Restoration Ecology*, 29(6), p.e13454. <https://doi.org/10.1111/rec.13454>
- Schiavina, M., Melchiorri, M., Freire, S., Florio, P., Ehrlich, D., Tommasi, P., Pesaresi, M. and Kemper, T., 2022. Land use efficiency of functional urban areas: Global pattern and evolution of development trajectories. *Habitat International*, 123, p.102543. <https://doi.org/10.1016/j.habitatint.2022.102543>
- Sims, N. C. et al. Developing good practice guidance for estimating land degradation in the context of the United Nations Sustainable Development Goals. *Environmental Science & Policy* 92, 349–355 (2019). <https://doi.org/10.1016/j.envsci.2018.10.014>
- Teich, I., Gonzalez Roglich, M., Corso, M.L., García, C.L., 2019. Combining Earth Observations, Cloud Computing, and Expert Knowledge to Inform National Level Degradation Assessments in Support of the 2030 Development Agenda. *Remote Sens.* 11, 2918. <https://doi.org/10.3390/rs11242918>
- Timm Hoffman, M., Skowno, A., Bell, W. & Mashele, S. Long-term changes in land use, land cover and vegetation in the Karoo drylands of South Africa: implications for degradation monitoring. *African Journal of Range & Forage Science* 35, 209–221 (2018). <https://doi.org/10.2989/10220119.2018.1516237>
- Trifonova, T.A., Mishchenko, N.V., Shutov, P.S. et al. Estimation of the Dynamics of Production Processes in Landscapes of the South Taiga Subzone of the Eastern European Plain by Remote Sensing Data. *Moscow Univ. Soil Sci. Bull.* 76, 11–18 (2021). <https://doi.org/10.3103/S0147687421010063>
- Venter, Z.S., Scott, S.L., Desmet, P.G., Hoffman, M.T., 2020. Application of Landsat-derived vegetation trends over South Africa: Potential for monitoring land degradation and restoration. *Ecol. Indic.* 113, 106206. <https://doi.org/10.1016/j.ecolind.2020.106206>

- von Maltitz, G.P., Gambiza, J., Kellner, K., Rambau, T., Lindeque, L., Kgope, B., 2019. Experiences from the South African land degradation neutrality target setting process. *Environ. Sci. Policy* 101, 54–62. <https://doi.org/10.1016/j.envsci.2019.07.003>

7.2 Academic dissertations

- Mahlaba, B., 2022. The assessment of degradation state in Ecological Infrastructure and prioritisation for rehabilitation and drought mitigation in the Tsitsa River Catchment (Masters dissertation, Rhodes University).
- Owuor, G.O., 2021. Monitoring Land Degradation Neutrality using Geospatial Techniques in Support of Sustainable Land Management: A Case Study of Narok County (Doctoral dissertation, University of Nairobi).

7.3 Other resources

Print documentation from the Trends.Earth project (including fact sheets, reports, and other materials) is listed below.

7.3.1 Reports

- A Review of Publicly Available Geospatial Datasets and Indicators In Support of Land Degradation Monitoring
- A Review of Publicly Available Geospatial Datasets and Indicators in Support of Drought Monitoring
- A Review of Publicly Available Geospatial Datasets and Indicators in Support of UNCCD Strategic Objective (SO) 2: To Improve Living Conditions of Populations Affected by Desertification, Land Degradation, and Drought
- Trends in Population Exposure to Land Degradation - Methodological note
- Arnold S., Jun C., Olav E. 2019. Global and Complementary (Non-authoritative) Geospatial Data for SDGs: Role and Utilisation. Report produced jointly by the Task Team on Global Data and Task Team on Alternative Data Sources by the Working Group on Geospatial Information of the Inter-agency and Expert Group on Sustainable Development Goal Indicators (IAEG-SDGs).
- Using Spectral Vegetation Indices to Measure Gross Primary Productivity as an Indicator of Land Degradation
- Evaluation of approaches for incorporating higher-resolution data for disaggregation or targeted analysis
- Disentangling the effects of climate and land use on land degradation
- Monitoring and assessing land degradation to support sustainable development
- (French) Suivre et évaluer la dégradation des terres pour soutenir le développement durable

7.3.2 Fact sheets

- Conceptual Fact Sheet for Trends.Earth
- Technical Fact Sheet for Trends.Earth