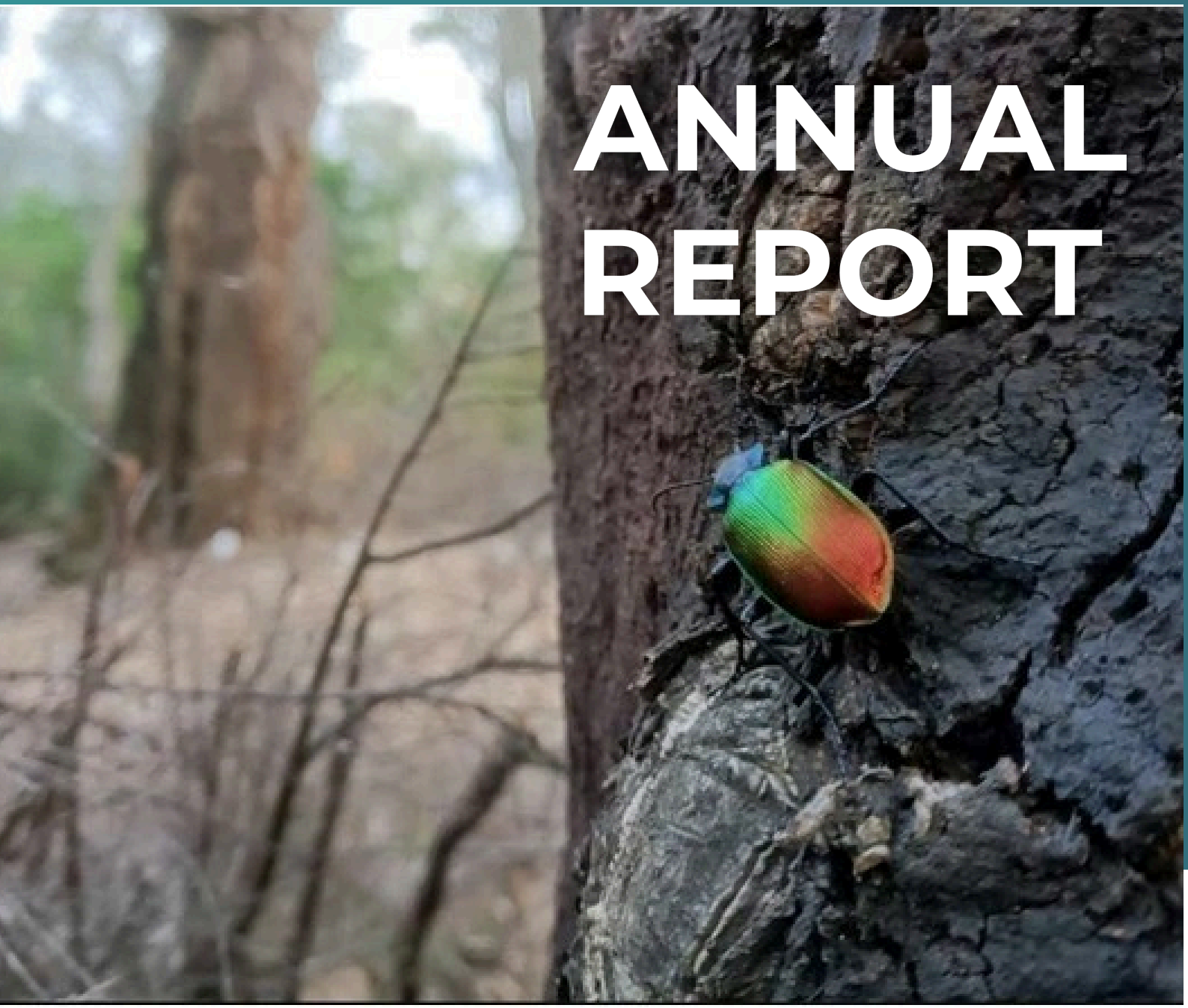
CENTRO DE INVESTIGACIONES SOBRE DESERTIFICACIÓN

CIDE



ANNUAL REPORT

2023

Centro de Investigaciones sobre Desertificación (CIDE, CSIC-UV-GVA)
Crta. CV315 Km 10,7. 46113 Moncada (València)

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Servicio científico de apoyo a la investigación y a la divulgación científica

Cover image:

C*alosoma sycophanta* in a Cork oak tree, near Breda (Girona)/JG. Pausas

CIDE Centro de Investigaciones Sobre Desertificación
CSIC Consejo Superior de Investigaciones Científicas
Universitat de València
Generalitat Valenciana

Table of Content

BOARD REPORT

El 2023 ha sido un año ciertamente intenso para el CIDE en el que se jubilaron Vicenta García, Gerente del CIDE durante muchos años y nuestro director, Patricio García-Fayos. Con la visita de la Presidenta del CSIC a nuestras instalaciones, pensábamos poner en marcha una nueva etapa en la gobernanza del CIDE que nos permitiera hacer efectiva la elección del nuevo Director determinada por el Claustro en Junio y emprender la redacción del nuevo convenio. Sin embargo, no se han podido llevar a cabo ninguna de las tareas pendientes y seguimos en una situación de precariedad institucional que nos limita extraordinariamente la capacidad de abordar los retos a futuro. Una situación en cuanto a la gobernanza del CIDE sin duda alguna muy compleja que, sin embargo, no ha afectado a la actividad científica del centro que ha seguido creciendo apoyada también por un excelente equipo de administración y gerencia.

Queremos destacar la puesta en marcha de nuestro propio Plan Estratégico que define una serie de acciones concretas que nos deben servir para mejorar la integración entre unas líneas de investigación cada vez mayores en número y en área temáticas. Además, buscamos fortalecer nuestra internacionalización y divulgación sin olvidar los esfuerzos que queremos emprender para mejorar las condiciones de trabajo de nuestro personal.

Un año lleno de resultados de relevancia científica internacional, pero también con actividades de transferencia al sector, de las cuales nos sentimos también orgullosos. Ampliamos además nuestra plantilla de investigadores con la incorporación de dos nuevos científicos titulares CSIC que nos permite seguir mirando al futuro científico del centro con optimismo. Todo ello es a la postre una excelente noticia para nuestra sociedad cada vez más necesitada de soluciones científicas para los enormes desafíos globales derivados del cambio climático, la sobreexplotación de los recursos naturales y la necesidad de comprender y proteger el medio ambiente que nos rodea.

Miramos al 2024, con sentimientos encontrados, nuestras investigaciones son cada vez más relevantes y necesarias, aunque nuestros patronos tardan en determinar las fórmulas que permitan asegurar nuestro futuro. Seguiremos trabajando e insistiendo, pero todo tiene un límite y tendremos que pedir que, en este 2024 que encaramos, se solucionen algunos de los retos pendientes que seguimos afrontando. Confiamos en lograrlo.

Firmado por PATRICIO GARCÍA-FAYOS POVEDA con un certificado emitido por FNMT

Patricio García-Fayos Poveda
Director saliente

VERDU DEL CAMPO MIGUEL - DNI 20151652H
Firmado digitalmente por VERDU DEL CAMPO MIGUEL - DNI 20151652H
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Miguel Verdú del Campo
ViceDirector científico y
Director en funciones

INTRIGLIOLO MOLINA DIEGO SEBASTIANO - DNI 26758334L
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Diego S. Intrigliolo Molina
Director electo

CIDE
at a glance

CIDE is a public research center devoted to the study of the causes, factors and processes of desertification and its impact on mainly Mediterranean ecosystems. Our nature as a mixed center (CSIC – Consejo Superior de Investigaciones Científicas, Universitat de València and Generalitat Valenciana) reflects the interest of local, regional and national institutions in our research, teaching and management tasks.

*CIDE researchers analyze **soil** in all its dimensions: in relation to climate, water, vegetation and human action; and at different scales, from the laboratory to the planetary scale.*

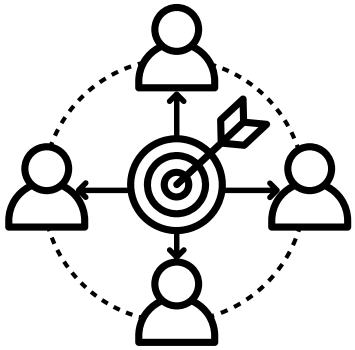
*The role of **air** in the transformation of our ecosystems is also a fundamental concern of CIDE researchers*

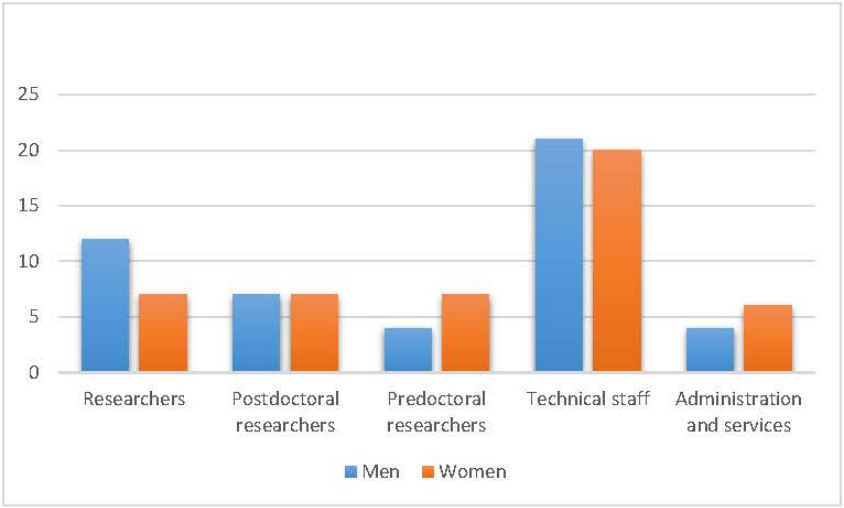
*CIDE has several research lines on **water**, both in natural systems and in systems managed by humans, focused on the study of its quality and the water use efficiency at several scales.*

***Fire** is a disturbing and shaping element of ecosystems, and therefore, an object of study at CIDE.*

*And from the four elements arises **life**, with all its diversity and complexity. The detailed and exhaustive study of biodiversity and the ecological processes that control its stability is another of the hallmarks of this centre.*

2023 in numbers





STAFF

During 2023, 95 people worked at the center and we welcomed 28 students and researchers from all over the world who visited us to collaborate or learn different techniques.

PUBLIC AND PRIVATE FUNDING

33 projects financed with international, national and regional public research funds were managed. In 2023, 21 public-private contracts, 3 Memorandums of Understanding (MoUs) and 4 public-public agreement were also managed.

NEW PROJECTS FUNDING

393.750€

240.665€

NEW CONTRACTS

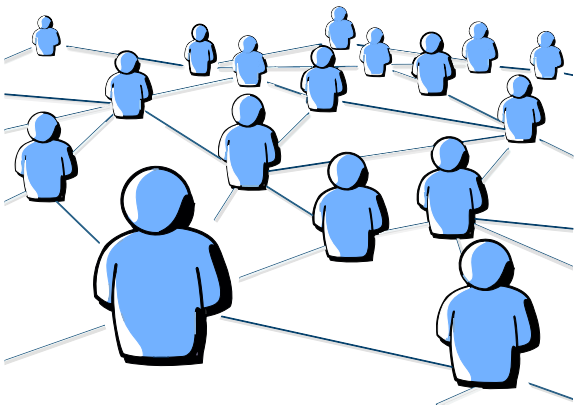
SCIENTIFIC PRODUCTION

118 scientific papers (61 D1, 30 Q1/54 Lead, 64 collaborations) 5 book chapters and 5 Books 34 Congress contributions (24 international, 10 national) 4 Seminars

2023 in numbers

11 Press releases
440 media appearances (traditional and digital)

www.uv.es/cide/novedades



Social Media

@CidEinvestiga

X: 105 posts, 166 reposts; Instagram: 4 posts; Youtube: 5 new publications

Outreach activities:

3 activities with 200 attendees in total

OUR HIGHLIGHTS

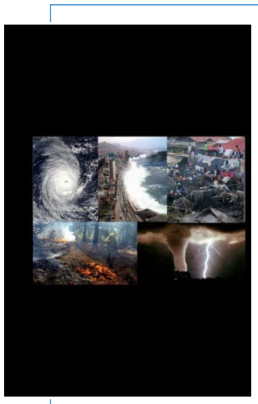
Fungi and algae in Antarctic lichens do not change their interaction patterns despite the adverse climate. A study by researchers from CSIC and the Complutense University of Madrid, published in the journal 'Global Ecology and Biogeography', addresses for the first time the diversity of fungi and algae in large-scale symbiosis, allowing the use of the framework of ecological interaction networks.

Sergio Pérez-Ortega, Miguel Verdú, Isaac Garrido-Benavent, Sonia Rabasa, T.G. Allan Green, Leopoldo G. Sancho & Asunción de los Ríos (2023). *Invariant properties of mycobiont-photobiont networks in Antarctic lichens*. *Global Ecology and Biogeography*. DOI: https://onlinelibrary.wiley.com/doi/10.1111/geb.13744

Line of research: *Evolution of ecological interactions. PI: Miguel Verdú*

Defense of the doctoral thesis of Ricardo Sánchez Martín: '**Unveiling species assemblage rules in gypsum plant communities**'. This thesis deals with patterns and mechanisms of coexistence between plant species in gypsum outcrops in the southeast of the Iberian Peninsula.

First Doctoral Thesis of the research line: *Multi-specific mutualisms in plant communities in arid environments. PI: Alicia Montesinos*



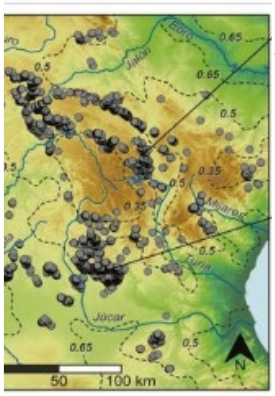
The CSIC and the University of Granada propose analysing catastrophic events from the perspective of ecological theory. The Desertification Research Centre (CIDE, CSIC-UV-GVA) coordinates this work, which proposes a new approach to major disturbances in human societies. The incorporation of the ecological theory of disturbances would help society to better understand and prepare for new catastrophic events such as earthquakes or epidemics.

Pausas JG & Leverkus A. 2023. Disturbance ecology in human societies. People and Nature 5(4): 1082-1093.

Line of research: *Evolutionary ecology and disturbances. PI: Juli G. Pausas*

Participation in the ITP+ Climate and Climate Services, and specifically in the project with AEMET 'Climate and Climate Services'. In particular, the CIDE is leading the development of a wind service based on the application of AI. Project funded by the Ministry for Ecological Transition and the Demographic Challenge. With the collaboration of the following researchers: Sergio M. Vicente Serrano (IPE-CSIC); Jose M. Gutiérrez (IFCA-CSIC); David Barriopedro (IGEO-CSIC); César Azorín Molina (CIDE, CSIC-UV-GVA); Dr. Santiago Beguería (EEAD-CSIC). Funding: 6,250,000 euros

Line of research: *Climate variability and climate services, with emphasis on wind. PI: César Azorín*



Moreno-de-las-Heras, M., Bochet, E., Vicente-Serrano, S.M., Espigares, T., Molina, M.J., Monleón, V., Nicolau, J.M., Tormo, J., García-Fayos, P. 2023. **Drought conditions, aridity and forest structure control the responses of Iberian holm oak woodlands to extreme droughts: A large-scale remote-sensing exploration in eastern Spain.** Science of the Total Environment 901, 165887.https://doi.org/10.1016/j.scitotenv.2023.165887

Line of research: *Plant-soil-erosion interactions in a context of global change and their implications for ecological restoration. PI: Esther Bochet*

Living Lab ValoraBobal. Established in 2018, with the long-term aim of selecting new clones of the Bobal grape variety, it has received a new boost in 2023 thanks to the launch of a European ERANET SUSCROP project coordinated by the CIDE (DiverGrape PCI2022-135095-2). Within the framework of this project and the activities of ValoraBobal, 8 clones of the Bobal variety with the best agronomic and oenological aptitudes have already been pre-selected and are currently undergoing final experimentation under different rootstocks. In this way, the first phase of the clonal selection process has been completed, identifying those biotypes that can provide a smaller berry size, an upright growth habit or greater productivity and efficiency in the use of water.

Line of research: Water and crops. PI: Diego S. Intrigliolo

Launch of the metabolomics work line for the biomonitoring of pollutants in aquatic organisms. Establish, by means of non-drug methods, the pollutants, metabolites and endogenous compounds in tissues and biofluids. Discover metabolic profiles and identify biomarkers altered by exposure of fish to contaminants through bioaccumulation studies in the laboratory and in the field.

Line of research: *Safety and environmental forensics. PI: Yolanda Picó*

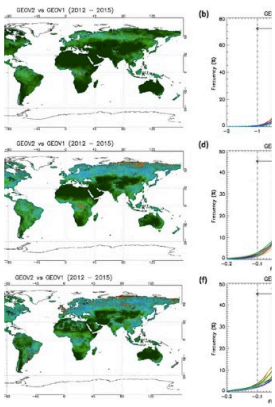
Launch of an application for mobile phones called Bioclima, designed to encourage the participation of citizen science in monitoring phenological changes, i.e. the rhythm of plants (https://www.csic.es/es/actualidad-del-csic/bioclima-la-nueva-aplicacion-movil-del-csic-para-monitorizar-el-ciclo-de-vida),

Outstanding scientific contributions: (i) a study that has identified the traits of the plant species most resistant to climate variations on a global scale (Conti et al., 2023, Proceedings of the Royal Society), (ii) the development of indicators to assess the stability of vegetation in dunes (La Bella et al., 2023, Journal of Ecology), and (iii) the conceptual advancement of indicators to understand resistance and resilience mechanisms at the level of plant communities (Fischer & de Bello, 2023, Nature, NJP Biodiversity)

.Líne of research: *Functional ecology and ecosystem stability. PI: Francesco de Bello*

Development of a Model to Estimate the Risk of Emission of Greenhouse Gases from Forest Fires. Victoria Lerma-Arce, Celia Yagüe-Hurtado, Helena Van den Berg, Miguel García-Folgado, Jose-Vicente Oliver-Villanueva , Yacine Benhalima, Inês Marques-Duarte, Vanda Acácio, Francisco C. Rego, Eduardo López-Senespleda , María Menéndez-Miguéle , Ricardo Ruiz-Peinad, Thomas Petillon, Stéphanie Jalabert, Ester Carbó-Valverde, Eugenia Gimeno-García, Rebeca Aleix-Amurrio and Edgar Lorenzo-Sáez. Fire. 2023. doi: 10.3390/fire6010008

Line of research: *Study of the effect of fire on the soil. PI: Eugenia Gimeno*



Scientific responsible for the development of the algorithms for the estimation of vegetation biophysical variables from satellites at the Copernicus Global Land Service. Contributes to the improvement of continuity, consistency and reliability of the time series of biophysical biophysical variables, including leaf area index and fraction of photosynthetically active radiation, at a photosynthetically active radiation, at a global scale (Verger et al. 2023).

GEOV2: Improved smoothed and gap filled time series of LAI, FAPAR and FCover 1 km Copernicus Global Land products. Aleixandre Verger, Jorge Sanchez-Zapero, Marie Weiss, Adrià Descals, Fernando Camacho, Roselyne Lacaze and Frédéric Baret. International Journal of Applied Earth Observation and Geoinformation 123 (2023) 103479.

Líne of research: *Remote sensing and global change. PI: Aleixandre Verger*

SCIENTIFIC PRODUCTION

SCIENTIFIC PAPERS

1. A. Ginebreda; D.Barceló; Y. Picó; M.Carrascal; J.Abián Environmental proteomics:a potential tool in wastewater-based epidemiology Water emerging contaminants&nanoplasticas 2 (2):6. 2023.DOI:10.20517/wecn.2023.19 https://www.oaepublish.com/articles/wecn.2023.19

2. Acosta, M.; Visconti, F.; Quiñones, A.; Blasco, J.; de Paz, J.M. Estimation of Macro and Micronutrients in Persimmon (Diospyros kaki L.) cv. "Rojo Brillante" Leaves through Vis-NIR Reflectance Spectroscopy Agronomy 13 (4):1105. 2023. DOI:10.3390/agronomy13041105 https://www.scopus.com/inward/record.uri?partnerID=HzOxMe3b&scp=85154036412&origin=inward

3. Álvarez-Ruiz, L.; Pausas, J.G.; Blumstein, D.T.; Putman, B.J. Lizards' response to the sound of fire is modified by fire history Animal Behaviour 196:91-102. 2023 DOI:10.1016/j.anbehav.2022.12.002 https://www.scopus.com/inward/record.uri?partnerID=HzOxMe3b&scp=85144984800&origin=inward

4. Andres-Martin, M.; Azorin-Molina, C.; Shen, C.; Fernández-Alvarez, J.C.; Gimeno, L.; Vicente-Serrano, S.M.; Zha, J. Uncertainty in surface wind speed projections over the Iberian Peninsula: CMIP6 GCMs versus a WRF-RCM Annals of the New York Academy of Sciences 1529 (1):101-108. 2023.DOI:10.1111/nyas.15063 https://www.scopus.com/inward/record.uri?partnerID=HzOxMe3b&scp=85177204395&origin=inward

5. Añó Vidal, C.; Valera Lozano, A.; Carbó Valverde, E. Is it necessary to update the land capability cartography of the Valencian Community? ¿Es necesario actualizar la cartografía de capacidad de uso del suelo de la Comunidad Valenciana? Cuaternario y Geomorfología 37:21-35. 2023.DOI:10.17735/cyg.v37i3-4.98605 https://www.scopus.com/inward/record.uri?partnerID=HzOxMe3b&scp=85183098232&origin=inward

6. Azorin-molina, D.; Dunn, r.j.h.; Ricciardulli, L.; Mears, C.A.; Mcvicar, T.R.; Nicolas, J.P.; Zeng, Z.; Bosilovich, M.G. [global climate; atmospheric circulation] land and ocean surface winds [in state of the climate in 2022]. Bulletin of the american meteorological society.

104.(9):s72-s74.2023.doi:10.1175/2023bamsstateoftheclimate.1
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7. Azorin-Molina, C.; Pirooz, A.A.S.; Bedoya-Valestt, S.; Utrabo-Carazo, E.; Andres-Martin, M.; Shen, C.; Minola, L.; Guijarro, J.A.; Aguilar, E.; Brunet, M.; Flay, R.G.J.; Vicente-Serrano, S.M.; McVicar, T.R.; Chen, D. Biases in wind speed measurements due to anemometer changes Atmospheric Research 289:106771. 2023
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