



Andrea Alejandra Drozd, Ph.D.

**Senior Consultant in Remote Sensing & GIS | Environmental Monitoring Specialist
| Water Quality & Forest Management Expert**

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About

Ph.D. in Natural Sciences with 15+ years of specialized experience in **remote sensing technologies and Geographic Information Systems (GIS)** applied to environmental monitoring and management. Proven track record providing high-level consultancy and advisory services to **national and international organizations**, including the **United Nations/FAO, CARU (Binational Uruguay River Commission), Salto Grande Technical Commission (CTM), Argentina's Ministry of Environment and Sustainable Development, and Buenos Aires Water Authority (ADA).**

Core Expertise: Satellite-based water quality monitoring | Cyanobacteria bloom detection and early warning systems | Forest change detection (deforestation/regeneration) | Landscape ecology | Google Earth Engine algorithm development | Operational geospatial product delivery for public agencies | Decision-support platforms for environmental management.

Technical Specializations: Multi-temporal satellite image processing (Landsat, SPOT, Sentinel-2) | Semi-analytical algorithm development for chlorophyll-a and cyanobacteria estimation | Field spectroradiometry | Spatial-temporal analysis | Land cover classification | Web-based monitoring platforms | Environmental risk assessment.

Professional Experience

 **Founder of CyanoSat:**

Buenos Aires – CyanoSat – October 2024

<https://cyanosat.com>

Cyanosat excels in the satellite detection and monitoring of cyanobacteria, as well as in water quality assessment. Through innovative solutions, Cyanosat makes a

significant contribution to environmental management and the preservation of water resources. Its technological approach enables effective monitoring of the health of aquatic ecosystems, promoting greater awareness and concrete actions to address contemporary environmental challenges,

Remote Sensing Advisor – Phytoplankton Monitoring

Buenos Aires Water Authority (ADA) | Government of Buenos Aires Province

August 2021 – Present

- Technical lead for satellite-based monitoring of **cyanobacteria blooms and trophic water quality** in provincial water bodies using Sentinel-2 imagery
- **Product Owner and Technical Responsible** for the **Algal Monitoring Web Platform** (Ciano-semáforo satelital), an operational early warning system serving government agencies and the public
- Conduct multi-temporal analysis of satellite-derived chlorophyll-a concentrations for Buenos Aires provincial lagoons
- Technology transfer and capacity building for technical teams in operational remote sensing applications
- **Award Recognition:** INNOVAR 2022 – Best Applied Research (National Agency for Scientific and Technological Promotion)

Director / Senior Advisor

Buenos Aires Water Authority (ADA) | Government of Buenos Aires Province

January 2024 – June 2025

- **Director** (January 2024 – February 2025): Strategic and technical leadership of water monitoring initiatives supported by remote sensing and GIS technologies
- **Senior Advisor** (March 2025 – June 2025): Expert advisory on geospatial strategies and operations for water resource management
- Representative of UNDAV to IDERA (Spatial Data Infrastructure of Argentina) since May 2017

Remote Sensing Specialist Consultant – UN-REDD+ Programme

United Nations Food and Agriculture Organization (FAO)

August 2017 – November 2018 | April 2019 – March 2020

- Developed **Google Earth Engine methodology** to systematize deforestation and forest regeneration monitoring in the **Paranaense Forest (Atlantic Forest)**, Argentina
- Technical support to Argentina's **National Forest Monitoring System (SNMB)** of the Ministry of Environment
- Adjusted digital coverages of native forest extent for the Paranaense region
- Generated operational cartographic products for conservation decision-making and REDD+ reporting

Remote Sensing Consultant – Water Monitoring

Salto Grande Binational Technical Commission (CTM)

August 2018 – 2019

- Produced comprehensive land use/land cover change analysis for Federación Department (Entre Ríos Province) spanning 1985–2015
- Developed satellite-derived products for operational monitoring of the Salto Grande reservoir and its watershed
- Technical report authoring on environmental impacts through spatial and temporal analysis

Remote Sensing & GIS Specialist

Administrative Commission of the Uruguay River (CARU) | Argentina-Uruguay Binational Organization

February 2014 – April 2016

- Developed and validated **semi-analytical algorithms** for chlorophyll-a and cyanobacteria concentration estimation using Landsat-7 ETM+ and SPOT-4 sensors
- Generated **operational maps** of chlorophyll-a concentration, surface water temperature, and trophic status for the Uruguay River
- Authored technical reports on trophic conditions to support algal bloom risk management

- Conducted spatial-temporal analysis of chlorophyll-a concentration in Salto Grande Reservoir and its relationship with climatic variables
- Led field spectroradiometry campaigns for spectral signature characterization of water bodies

Remote Sensing Specialist

Ministry of Environment and Sustainable Development | Argentina

October 2020 – December 2020 | July 2021 – December 2021

- Geospatial technical support for national environmental programs and native forest conservation initiatives
- Advisory services on remote sensing applications for environmental monitoring

Remote Sensing Research Fellow

National Space Activities Commission (CONAE)

May 2012 – February 2013

- Research internship focused on development of remote sensing applications for environmental monitoring
- Participation in national projects utilizing space-based technologies

Remote Sensing Technical Specialist

Universidad Católica de La Plata (UCALP)

March 2004 – May 2006

- Detection of forest plantations and exotic species invasions in protected areas using remote sensing techniques
- Application of satellite image classification methodologies

Key Technological Products & Achievements

Ciano-semáforo Satelital (Satellite Cyano-Traffic Light) | 2022

Innovative system for cyanobacteria detection and hazard assessment in Buenos Aires water bodies using remote sensing. Public web platform for consultation and early warning

 <https://adrozdz.users.earthengine.app/view/cianosemaforo->


 **INNOVAR 2022 Award** – Best Applied Research (ANPCyT)

 **Forest Monitoring Methodology for Misiones Province | 2018**

Google Earth Engine methodology for systematizing forest changes (deforestation/regeneration) in the Paranaense Forest. Developed for FAO-UN and Argentina's Ministry of Sustainable Development

 **Operational Chlorophyll-a Raster Layers for Uruguay River | 2015**

Operational cartographic products transferred to CARU for systematic monitoring of water trophic quality

 **Trophic Status Reports – Uruguay River | 2014–2017**

Technical situation reports and time series analysis of chlorophyll-a in Salto Grande Reservoir with associated climatic analysis

Education & Academic Credentials

 **Ph.D. in Natural Sciences**

Faculty of Natural Sciences and Museum | National University of La Plata (UNLP)
2006 – 2011

- **Dissertation:** "Spatial and temporal dynamics of landscape structure in the Cuña Pirú Valley and surroundings, Misiones, in relation to land use"
- **Advisors:** Dr. Marcelo Arturi | Dr. Sandra Torrusio
- **Funding:** YPF Estenssoro Foundation Doctoral Fellowship

 **Bachelor of Biological Sciences (Botany Specialization)**

Faculty of Natural Sciences and Museum | National University of La Plata (UNLP)
2000 – 2003

 **Teaching Certificate in Natural Sciences**

Instituto Superior de Formación Docente N° 17
2003 – 2004

Specialized Training & Professional Development

Postdoctoral Fellowship

Monitoring water trophic quality of the Uruguay River through remote sensing

CARU-CONAE | 2011–2013

Advanced Remote Sensing & GIS Training

- **Spring School 2021** – Instituto Gulich, CONAE (2021)
 - **Google Earth Engine Workshop** – Automation of deforestation monitoring, UN (2017)
 - **Atmospheric Correction with MODTRAN** – CONAE (2012)
 - **ERDAS APOLLO Administrator** – Spatial Data Infrastructure (2012)
 - **Remote Sensing Course** – FCNyM, UNLP (2008)
 - **Advanced Security in the Field** – United Nations (2017)
 - **Photogrammetry Applied to Topography** – UNCOMA (2020)
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Technical Competencies

Remote Sensing Technologies

- **Satellite platforms:** Landsat (TM, ETM+, OLI), SPOT-4/5, Sentinel-2
- **Algorithm development:** Semi-analytical models for chlorophyll-a and cyanobacteria estimation
- **Google Earth Engine:** Automated workflows and web application development
- **Field spectroradiometry:** Hyperspectral signature characterization
- **Atmospheric correction:** MODTRAN radiative transfer modeling
- **Time series analysis:** Multi-temporal satellite data processing
- **Image classification:** Supervised and unsupervised land cover mapping

Geographic Information Systems

- **Software proficiency:** ArcGIS, ERDAS APOLLO, QGIS
- **Spatial analysis:** Multi-variate spatial-temporal modeling

- **Cartographic modeling:** Geomorphometric analysis and terrain modeling
- **Digital Terrain Models (DTM):** Generation and hydrological applications
- **Spatial Data Infrastructure (SDI):** Implementation and management

Environmental Applications

- **Water resources:** Trophic water quality monitoring, cyanobacteria bloom detection, eutrophication assessment
- **Forest ecosystems:** Deforestation/regeneration detection, forest dynamics analysis
- **Landscape ecology:** Fragmentation analysis, connectivity assessment, land use change detection
- **Ecological modeling:** Holdridge Life Zones, climate-based ecological unit characterization

Operational Product Development

- Web-based monitoring platforms and dashboards
- Decision-support cartography for public agencies
- Environmental management information systems
- Technical reporting for governmental stakeholders

Research & Academic Experience

Researcher

- **UNDAV** – Department of Technology and Administration (2023–present)
- **CREG-UNLP** – Regional Center for Genomic Studies (2019–2022)
- **LISEA-UNLP** – Laboratory for Research in Ecological and Environmental Systems (2015–2019)

University Teaching Positions

Adjunct Professor – Remote Sensing and GIS

National University of Avellaneda (UNDAV) | 2015–Present

Assistant Professor – Remote Sensing

Faculty of Natural Sciences and Museum, UNLP | 2014–Present

Contract Professor – GIS and Remote Sensing (Postgraduate)

Faculty of Exact and Natural Sciences, University of Buenos Aires | 2017–2021

Training & Capacity Building Experience

Professional Training for Public Organizations

- **CARU:** Introduction to GIS and GPS use (2014–2016)
- **National University of Río Negro:** Introduction to GIS (2014)
- **Provincial Institute of Public Administration (IPAP):** ArcGIS Level 1 & 2 (2011)
- **CISAUA/IGS-UNLP:** Remote Sensing Training (2009)

Graduate Student Supervision

- **Doctoral thesis director:** María Rosa Derguy (UNLP, 2020)
 - **Master's thesis director:** Gastón Carranza (UADER, 2021)
 - **Doctoral thesis co-director:** Carolina Baldini (UNLP, 2020)
 - **Postdoctoral fellow co-supervisor:** Lorena Pérez Carusi (CONICET, 2016–2018)
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Selected Publications

Peer-Reviewed Journal Articles

Drozd A.A., Chorus I., Welker M. (2021). *Remote Sensing of Cyanobacteria: The Case Study of Salto Grande Reservoir*. In: Toxic Cyanobacteria in Water. Taylor & Francis Group

Drozd A.A. et al. (2019). *Monitoring cyanobacteria occurrence in freshwater reservoirs using semi-analytical algorithms and orbital remote sensing*. Marine and Freshwater Research. CSIRO Publishing

Gangi D., Frau D., Drozd A.A. et al. (2021). *Integrating field and satellite monitoring for assessing environmental risk associated with bacteria in recreational waters*. Science of The Total Environment. Elsevier

Baldini C., Marasas M., Tuttonell P., Drozd A.A. (2022). *Urban, periurban and horticultural landscapes – Conflict and sustainable planning in La Plata district, Argentina*. Land Use Policy. Pergamon

Derguy M.R., Drozd A.A., Martinuzzi S. et al. (2019). *Effect of climate data uncertainty on ecological land classification: A case study from Argentina*. Climate Research

Codesido M., Drozd A.A. (2021). *Alien birds in Argentina: pathways, characteristics and ecological roles*. Biological Invasions. Springer

Research Projects (Selected)

Water Quality Monitoring – Uruguay River | 2013–2019

CARU | Development of remote sensing methodologies for trophic variable estimation, spatial-temporal pattern analysis, and operational product generation

Forest Plantations and Environmental Effects | 2014–2022

UNLP | Analysis of extent, forestry policies, and environmental consequences at regional scale using remote sensing and GIS

Cyanobacteria Detection System Development | 2021–Present

Buenos Aires Government | Satellite-based early warning system for provincial water bodies

Landscape Dynamics in Misiones | 2006–2011

YPF Foundation | Spatial-temporal analysis of landscape structure in the Cuña Pirú Valley in relation to land use

Awards & Recognition



INNOVAR 2022 Award – Best Applied Research

National Agency for Scientific and Technological Promotion (ANPCyT)

For development of the Ciano-semáforo satelital system



Best Presentation Award

I Argentinian Congress of Remote Sensing (CONAE, 2012)

Best Presentation Award

II Landscape Ecology Conference (2009)

Subsequently invited to I Latin American Landscape Ecology Conference (Brazil)

Professional Networks & Scientific Service

International Scientific Networks

- **CyanoSur** (2021–present): Latin American network for cyanobacteria monitoring
- **Spectroradiometer Users Group** (2014–present): International network of institutions (CONAE, INTA, CARU, universities)

Institutional Representation

- **UNDAV Representative to IDERA** (Spatial Data Infrastructure of Argentina) since 2017

Professional Peer Review

- **Limnologica** (Elsevier, Germany)
- **Environmental Monitoring and Assessment** (Springer, USA)
- **AUGM-DOMUS** (UNLP, Argentina)

Scientific Committee & Panel Participation

- **Panelist** – CONAGUA 2023 (National Water Institute, Argentina)
 - **Panelist** – 8th International Congress on Water Management and Treatment (Universidad Blas Pascal, 2020)
 - **Panelist** – Forum on Eutrophication Mitigation and Cyanobacteria Workshop (CTM Salto Grande, 2019)
 - **Scientific Committee Member** – I Conference on Eutrophication and Harmful Algal Blooms (CARU, 2015)
 - **Speaker** – XXI ISPRS Congress, Beijing, China (2008)
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Languages

GB **English:** Advanced (technical reading, writing, communication)

ES **Spanish:** Native

UA **Ukrainian:** Advanced (native language)

Consulting Services Offered


- ✓ **Satellite-based monitoring systems** for water resource management
 - ✓ **Early warning methodologies** for cyanobacteria blooms
 - ✓ **Forest monitoring:** deforestation and regeneration detection
 - ✓ **Environmental assessments** using remote sensing and GIS
 - ✓ **Technical training** for governmental teams
 - ✓ **Spatial Data Infrastructure** implementation
 - ✓ **Geospatial web platform** development
 - ✓ **Advisory services** for multilateral organizations and public agencies
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Professional Focus

Available for:

- National and international consultancies
 - Specialized technical advisory services
 - Project development and implementation
 - Technical training and capacity building
 - Inter-institutional collaborations
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References and technical portfolio available upon request