

# **ESARDA Bulletin – The International Journal of Nuclear Safeguards and Non-proliferation**

## **Special Issue on Data Analytics for Safeguards and Non-Proliferation**

Recent advances in data analytics have the potential to make significant contributions to the fields of nuclear safeguards and non-proliferation. ESARDA has recognized this potential, and specifically called out topics relevant to data analytics including business intelligence and artificial intelligence in the 2019 World Café activity from the 42<sup>nd</sup> Annual Meeting held in Stresa, Italy, in May 2019.<sup>1</sup> In order to provide a single forum for the latest research and development on data analytics for nuclear safeguards and non-proliferation, the ESARDA's Verification Technologies and Methodologies (VTM) working group is organizing a special topical issue of the ESARDA Bulletin on data analytics. The special issue will feature manuscripts describing research and development of data analytics methods applied to safeguards and non-proliferation data or use cases. Potential topics of interest for this issue include (not exhaustive):

- Business intelligence of strategic nuclear trade or safeguards operations
- Data integration between multiple safeguards sensors or data sources such as state-declared information and geospatial data
- Data visualization of destructive and non-destructive assay results to support enhanced non-proliferation assessments
- Distributed ledger technologies applied to nuclear material tracking or arms control scenarios
- Explainability, uncertainty, and interpretability of methods applied to safeguards and non-proliferation
- Multi-modal or unstructured information retrieval for non-proliferation analysis
- New analytical methods for state-level assessments of strategic trade and industrial capability
- Novel approaches for the review of surveillance data
- Prediction and anomaly detection for safeguards and strategic trade data
- Statistical sampling methods to improve random sampling or probability of detection for safeguards
- Summarization or content review for open source multimedia data in support of safeguards analyses

Researchers considering submission to this special issue might consider some of the following questions:

- How might we better integrate data collected from in-field activities with other analyses?
- How we might better leverage our current operational data to support more efficient business processes?

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<sup>1</sup> The World Café report can be downloaded here: [https://esarda.jrc.ec.europa.eu/world-cafe-report-2019\\_en](https://esarda.jrc.ec.europa.eu/world-cafe-report-2019_en)

- How might we use the few historical examples of proliferation events to train models without implementing undue bias?
- How might users such as safeguards inspectors and analysts interpret the results from our novel approaches or methods?
- How might we translate novel approaches from other domains to nuclear safeguards and non-proliferation?
- How might we support the analysis of material balance data to be more efficient?

#### Information for authors:

The ESARDA Bulletin – The International journal of Nuclear Safeguards and Non-proliferation - is the academic peer-reviewed journal featuring scientific articles related to Safeguards and Non-proliferation. All the submitted contributions will undergo a double-blind peer review process, according to the standard of Scopus indexed publications. More information can be found in the [ESARDA Bulletin publication policies](#).

In order to submit your contribution you are kindly invited to submit a short abstract of the work by **September 1<sup>st</sup>, 2021**, together with the [paper submission form](#).

In order to submit your manuscript, please follow the instructions below:

- Prepare a full paper in MS word format strictly following the new [ESARDA Publication template](#).
- Send the manuscript (MS Word format) to the ESARDA Bulletin email address [ec-esarda-bulletin@ec.europa.eu](mailto:ec-esarda-bulletin@ec.europa.eu) by **September 30<sup>th</sup>, 2021**. For papers received after the deadline it will be not granted the publication in the special issue and they will be eventually considered for publication in the Issue 64 (June 2022).

For editorial or submission questions, refer to the ESARDA Bulletin's editors: [ec-esarda-bulletin@ec.europa.eu](mailto:ec-esarda-bulletin@ec.europa.eu). For topical or content questions regarding the special issue, contact the guest editor, Zoe Gastelum: [zgastel@sandia.gov](mailto:zgastel@sandia.gov)

#### Intended timeline for the special issue:

Sept 1, 2021	Abstracts due to ESARDA. This serves as a notification of intent to submit full papers and will not result in a publication decision from the editors.
Sept 30, 2021	Full manuscripts due to ESARDA for peer review
Oct 20, 2021	Authors notified of results of peer review
Nov 10, 2021	Final manuscripts due to ESARDA
Dec 2021	Publication of the special issue