



William Becker

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ABOUT ME

- Policy-oriented data scientist and composite indicator specialist with 15+ years of experience in quantitative science for policy, including over a decade at the JRC.
- Expertise in the design, development and application of composite indicators and scoreboards, including data integration, methodological frameworks and reproducible analytical pipelines supporting EU and international policy.
- Specialist in uncertainty quantification and sensitivity analysis for complex systems, with a strong focus on robustness, transparency and responsible interpretation of models and indicator frameworks.
- Experienced developer of analytical tools in R, including widely used open-source packages, with ~30 peer-reviewed publications (~3800 citations) on modelling, uncertainty and policy-oriented indicator frameworks.
- Extensive track record of translating advanced analytical results into clear, actionable insights for policymakers and international stakeholders.

WORK EXPERIENCE

TRAINING SPECIALIST IN MACHINE LEARNING (FORECASTING & DATA SCIENCE APPLICATIONS) – EUROPEAN CENTRE FOR MEDIUM-RANGE WEATHER FORECASTING – 16/05/2024 – Current – BONN, GERMANY

At ECMWF, I lead the planning, development and coordination of advanced training and capacity-building activities in AI and machine learning for weather and climate forecasting, supporting national meteorological and climate services, European and international policy organisations and the wider research community. My work focuses on translating advanced analytical methods into practical tools, guidance and decision-support resources for large-scale scientific and policy-relevant applications.

Key responsibilities include:

- Leading a €500k training and capacity-building programme for DG-CNECT's Destination Earth programme, including procurement, project/contract management, and coordination of multidisciplinary teams (~10 contractors, ~30 scientists) to deliver Massive Open Online Courses (MOOCs) and capacity-building activities to ~3,000 participants globally.
- Designing and delivering technical training courses (week-long in-person events, plus online courses) on advanced data science and deep learning approaches for high-dimensional geospatial data and forecasting systems, including ethical and policy dimensions (AI Act, etc.).
- Collaborating with international organisations, private sector and academia including WMO, Google DeepMind, US and Middle-Eastern universities to support uptake of advanced AI tools in developing countries.
- Evaluating and supervising technical grant applications for the EU's Copernicus (C3S) National Collaboration Program, including technical + methodological assessment.
- Co-leading the development of a web-based training catalogue indexing ECMWF's training resources, supporting long-term capacity building and knowledge sharing.
- Engaging with scientific users through global surveys, workshops and bilateral meetings to identify analytical and training needs and reporting and visualising training and user data through interactive dashboards and analytical tools.
- Contributing to communication and dissemination strategies, including coordination with internal and external communication teams to maximise reach and impact of training activities.
- Liaising with European and international policy organisations (e.g. DG CNECT, EEA, WMO) to ensure alignment with policy objectives in a politically sensitive and multi-stakeholder context.

SENIOR DATA SCIENCE CONSULTANT (POLICY ANALYTICS & COMPOSITE INDICATORS) – UN/EUROPEAN INSTITUTIONS, GLOBAL CONSULTANCIES – 01/10/2020 – 15/05/2024 – ISPRA, ITALY

I built a successful composite indicator consultancy, leading design, methodological guidance and platform development for JRC, CEDEFOP, RTD, UNIDO, UNHCR, WIPO and global partners (including national governments). I delivered 30+ contracts over 3.5 years supporting evidence-based policy making across domains including innovation, skills, sustainability and migration.

My work focused on transparent and reproducible analytical pipelines (R, APIs, version control) combined with stakeholder engagement, project delivery and development of strategic partnerships with international organisations, private sector and academia.

Selected projects (see Annex 1 for a full list of composite indicator projects)

- [COINr](#) [JRC + personal]: designed and developed a widely used R package for composite indicator construction, analysis and visualisation (29,000+ downloads), integrating advanced methods (PCA, Copeland, global sensitivity analysis, weight optimisation) with extensive documentation and methodological guidance.
- [Quality Infrastructure for Sustainable Development Index](#) [UNIDO]: technical lead for the design and implementation of global composite indicator to support UN Quality Policy including framework design, methodology, data collection, stakeholder engagement, reporting.
- [A2SIT App](#) [UNHCR]: designed and developed a decision-support tool enabling construction, analysis and visualisation of composite indicators from humanitarian datasets (including geospatial visualisation).
- [Composer app](#) [FIND]: developed a web-based platform for end-to-end composite indicator construction, including data treatment, visualisation and sensitivity analysis.
- [Lead role in major international composite indicators](#):
 - transition of the Global Innovation Index (WIPO) to a fully reproducible and documented R-based pipeline
 - leading major updates to the European Innovation Scoreboard (RTD) and European Skills Index (CEDEFOP), supporting EU innovation, skills and employment policies (e.g. European Semester, Skills Agenda) through successful consortium bids.
- [Further policy support work for JRC](#): developed uncertainty analysis package for the EDGAR global emissions database, methodological/analytical contributions to the Bioeconomy Monitoring Framework, impact assessment analysis (CC-MOD).

Core responsibilities

- Design, construction, and auditing of composite indicators for multi-source datasets in European and global policy contexts.
- Application of advanced statistical methods: imputation, time series analysis, sensitivity analysis, aggregation (including DEA, BOD) and understanding of implications and limitations.
- Writing methodological guidance and technical documentation via online books, blogs, manuals, literate programming.
- Development of reproducible API-based data pipelines, cleaning and harmonising heterogeneous international data.
- Communication of results through reports, dashboards and interactive data visualisation, translating complex analysis into actionable insights for policymakers.
- Stakeholder engagement and project delivery, including coordination of multidisciplinary teams, workshops, proposal writing, budget estimation and management of multiple projects and contracts in parallel and under time pressure.

SENIOR DATA SCIENTIST / POLICY ANALYST (CONTRACT AGENT FGIV, EUROPEAN COMMISSION – JRC) – EUROPEAN COMMISSION - JOINT RESEARCH CENTRE – 17/03/2014 – 15/03/2020 – ISPRA, ITALY

Senior researcher within the JRC's Competence Centres for Composite Indicators and Scoreboards and Modelling (CC-COIN, CC-MOD), supporting the European Commission and international organisations in the design and implementation of composite indicators and data-driven policy frameworks.

Work focused on the development of indicator systems and monitoring frameworks based on international datasets, with a strong emphasis on robustness, uncertainty analysis and the translation of complex analytical results into actionable policy insights, acting as a bridge between science and policy. Worked successfully across numerous policy domains, building connections with various JRC units, Commission DGs, and external organisations.

Selected projects

- Lead researcher on four-year support package to DG-BUDG on performance indicators for monitoring 60+ EU spending programmes.

- Co-lead on the [ASEM Sustainable Connectivity Portal](#): major composite indicator support file for EEAS under the Europe-Asia Strategy, end-to-end construction, politically sensitive context, senior stakeholders.
- Updates and reporting of the EU2020 Index for DG REGIO to monitor EU2020 targets (employment, energy, education, etc.) on regional/national levels.
- Provided technical guidance for the Regulatory Scrutiny Board and DG-BUDG for monitoring and evaluating EU spending programmes in the 2021-27 MFF (with CC-ME and JRC colleagues).
- Co-development, release and documentation of the [COIN Tool](#), supporting composite indicator construction and used in training and applied policy contexts.

Core responsibilities

- Design, implementation and methodological support for composite indicators and scoreboards for monitoring EU policies and spending programmes, including international data collection, cleaning, analysis and visualisation.
- Translation of policy needs into technical specifications, including design and coordination of analytical projects, stakeholder engagement, liaising with policy DGs.
- Preparation of technical reports, policy briefs and presentations for senior Commission stakeholders to communicate research findings, adapting to technical/non-technical audiences.
- Contribution to academic research in composite indicator methodology and application (journal papers, conferences, book chapters).
- Application of uncertainty quantification and sensitivity analysis to ensure robustness and support evidence-based policy conclusions
- Organising and lecturing at training courses for European Commission and policy/academic audiences on composite indicators (including COIN Weeks) and sensitivity analysis.
- Auditing composite indicators for external organisations, e.g. UN, Tax Justice Network, others. Ad-hoc methodological support through COIN Open Days to promote high-quality, responsible composite indicator construction.

SCIENTIFIC RESEARCHER (POSTDOCTORAL FELLOW, GRANTHOLDER CATEGORY 30) – EUROPEAN COMMISSION - JOINT RESEARCH CENTRE – 16/02/2011 – 15/02/2014 – ISPRA, ITALY

Postdoctoral researcher providing statistical and methodological support to European Commission services, particularly in the context of impact assessments, indicator development and model evaluation. Work focused on sensitivity and uncertainty analysis, and the application of quantitative methods to support robust and evidence-based policy making.

Selected projects

- Statistical quality control and methodological support for European Commission impact assessments (Secretariat-General).
- Analysis of price disparities across EU Member States (DG JUST).
- Contributions to the development of modelling and sensitivity analysis/auditing toolboxes for the Better Regulation Guidelines for EU impact assessments.

Core responsibilities

- Support to JRC and European Commission in application of sensitivity analysis and uncertainty quantification to assess robustness of policy-relevant models
- Analysis and integration of economic and policy datasets across EU Member States
- Contribution to impact assessments through quantitative analysis, quality control and model review.
- Research into sensitivity analysis of complex models, especially applying machine learning / data modelling and Bayesian approaches.
- Preparation of technical reports, policy inputs and scientific publications, statistical visualisation of scientific data and results.
- Organisation and delivery of training courses, seminars and summer schools.
- Communication of complex analytical results to policy audiences.

● EDUCATION AND TRAINING

13/11/2006 – 26/01/2011 Sheffield, United Kingdom

PHD IN MECHANICAL ENGINEERING University of Sheffield, Dept. Mechanical Engineering

Thesis title "Uncertainty Propagation Through Large Nonlinear Models". Uncertainty and sensitivity analysis, Bayesian statistics, computer science and machine learning, computer modelling (finite element analysis), biomechanical modelling, computer programming. Application of advanced data modelling approaches in data-scarce contexts.

During my PhD I also spent 2008-2009 working as a researcher at the *Politecnico di Torino* in Turin, Italy, performing fluid-structure modelling of prototype airships.

Field of study Mechanical Engineering | **Thesis** Uncertainty Propagation Through Large Nonlinear Models

22/09/2002 – 23/06/2006 Sheffield, United Kingdom

MENG IN MECHANICAL ENGINEERING University of Sheffield, Dept. Mechanical Engineering

Including: Mathematics, Signal Processing, Condition Monitoring, Computer Modelling and Validation, Solar and Wind Energy, Nuclear Reactor Engineering and Spanish Foreign Languages at Work (FLAW) to level 4.

This included a year as an Erasmus student in Seville, Spain.

Field of study Mechanical Engineering | **Final grade** 2:1

04/09/1999 – 24/06/2001 Salisbury, United Kingdom

A LEVELS Bishop Wordsworth Grammar School

Final grade A (Maths); A (Physics); A (Geography)

● LANGUAGE SKILLS

Mother tongue(s): **ENGLISH**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ITALIAN	C2	C2	C2	C2	C1
SPANISH	B1	B2	B1	B1	B1
FRENCH	B1	B2	B1	B1	B1
GERMAN	B1	B1	B1	B1	B1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

● SKILLS

Data Analysis and Modelling

R | MATLAB/Octave | Python (computer programming) | SQL | Microsoft Excel | statistical modeling techniques | Econometrics | Machine Learning | PyTorch | Sensitivity and uncertainty analysis (Monte Carlo)

Data Visualisation and Interactive Tools

Plotly | Shiny | ggplot2 | Mapping (leaflet)

Data Engineering and Reproducibility

Git | GitHub | CI/CD | Unit testing | Data integration and processing

Drafting and reporting

LaTeX | R Markdown | Quarto | Microsoft Powerpoint | Microsoft Word

Web

HTML | CSS

● PUBLICATIONS

Academic Publications

Author of 30+ peer-reviewed journal articles, plus conference papers, and book chapters, primarily in the areas of composite indicator methodology and application, and uncertainty/sensitivity analysis of complex models. ~3,800 citations, h-index: 26.

Selected publications:

- [Weights and importance in composite indicators: Closing the gap](#) [First author, 500+ citations]
- [The future of sensitivity analysis: an essential discipline for systems modeling and policy support](#) [600+ citations]
- [Development of a bioeconomy monitoring framework for the European Union](#) [100+ citations]

Co-founder of AESCON international conference on sustainable (international) connectivity, scientific committee lead/member on various conferences, keynote presentations, guest journal editor.

Full publication list:

- See Annex 2 following this CV
- [Google Scholar](#)
- [ResearchGate](#)

● **COMMUNICATION AND DISSEMINATION**

Communication

Extensive experience communicating complex analytical and scientific concepts to diverse audiences, including policymakers, technical experts, and non-specialists. Particular focus on clear writing, data storytelling, and translation of quantitative results into policy-relevant insights. Experience with external communications and social media campaigns, working with comms departments.

Written communication (examples):

- [Technical reports](#) for European Commission services and senior stakeholders
- Peer-reviewed [academic publications](#)
- Accessible [blog content](#) on composite indicator methodology and implementation

Oral communication:

- Numerous presentations at international conferences and professional workshops, including invited and keynote talks to senior policy officials
- Design and delivery of 25+ training courses over 15 years (including many coordination and lead instructor roles), including 13 on composite indicators, seven JRC COIN Week courses.