This expanded bibliography is provided so interested readers can more easily search for the extensive technical documentation generated by Goodman and team over the years. [numbers in { } are used in earlier version of paper to link to this bibliography]

Annual Reports and Other Key Products (in approximate chronological order)

a) Annual Report, Montana State University to US EPA, Strategy Development for Environmental Surveys, Principal Investigator, Daniel Goodman, 8/1/1989 to 7/31/90
   - Appendix A – Question Module Frames (DQO ES) {1}
   - Appendix B – Sampling Error Rate Estimation {2}
   - Appendix C – Model Validation {3}

b) Annual Report, Montana State University to US EPA, Strategy Development for Environmental Surveys, Principal Investigator, Daniel Goodman, 8/1/1991 to 7/31/1992
   - Appendix 1 – Development of a Survey Design for Superfund Soil Cleanup {4}
   - Appendix 2 – ThePiazza Road Dioxin Site Cleanup: Observations on Applying the RD/RA Sampling Design {5}
   - Appendix 3 – Planning Issues for Superfund Site Remediation {6}
   - Appendix 4 – Summary of the Documentation of the Expert System Software – DQO ES {7}
   - Appendix 5 – Programs for Data Smoothing – Nonparametric Regression {8}
   - Appendix 6 – Model Validation: An Annotated Bibliography {9}

c) User's Guide for DQO Expert System Program, DQOES version 1.0b, MSU Environmental Statistics Group, August 1, 1992 {10}

d) Annual Report, Montana State University to US EPA, Strategy Development for Environmental Surveys, Principal Investigator, Daniel Goodman, 8/1/1992 to 7/31/1993
   - Appendix 1 – Software Policy (boilerplate) {11}
   - Appendix 2 – Review of Data Quality at Piazza Road Site {12}

- Appendix 3 – Design of Pilot Surveys for Superfund {13}
- Appendix 4 – Summary of Initial Activities at TA10 Site (Los Alamos) {14}
- Appendix 5 – Contouring using Hexagonal Bins {15}
- Appendix 6 – Initial Planning for Collierville Site {16}

e) Annual Report, Montana State University to US EPA , Strategy Development for Environmental Surveys, Principal Investigator, Daniel Goodman, 8/1/1993 to 7/31/1994
   - Appendix 1 – Software Policy (boilerplate) {17}
   - Appendix 2 – TA-10 Final Report {18}
   - Appendix 3 – Collierville Status Report {19}
   - Appendix 4 – Status of Collierville DQO {20}
   - Appendix 5 – Kriging {21}
   - Appendix 6 – Geographical Data Analysis {22}
   - Appendix 7 – General Cartographic Transformation Software {23}
   - Appendix 8 – Illustration of Statistical Hypothesis Testing with GIS Data {24}
   - Appendix 9 – Data Utility Programs {25}
   - Appendix 10 – XYPlot Software {26}
   - Appendix 11 – Scroll Software {27}

f) Final Report, Montana State University to US EPA, Strategy Development for Environmental Surveys, Daniel Goodman, October 19, 1994
   - Appendix 1 – Cubic Spline Smoothing and Cross Validation {28}
   - Appendix 2 – Variance Components in the General Linear Model {29}
   - Appendix 3 – Kriging Methodological Developments (selecting the variogram model and selecting the Kriging neighborhood) {30}

g) Report on Total Rad Sr in WAG1 (Bethel Valley at Oak Ridge), Daniel Goodman, 7/1/96 {31}

h) Bethel Valley Soil and Groundwater Sr-90 Statistical Analysis: Final Report in support of the DQO, Daniel Goodman, 9/30/97 {32}

i) Annual Report, Montana State University to US DOE, Extension and Enhancement of Methods for Setting Data Quality Objectives, Principal Investigator, Daniel Goodman, 10/01/95 to 9/30/96

- Appendix 1 – Sequencing Issues in the DQO Process (for large family of alternative plans and alternative decision rules augment statistical decision theory with adaptive optimal control theory) {33}
- Appendix 2 – A Compendium of Univariate Conjugate Priors {34}
- Appendix 3 – DQO Calculations for the Number of New Samples {35}
- Appendix 4 – Variance Components Estimation and Inference {36}
- Appendix 5 – Inner Product Matrices, Kriging, and NonParametric Estimation of Variogram {37}
- Appendix 6 – Co-Kriging: A Critical Review {38}
- Appendix 7 – Cross-Validated Smooting Spline Theory {39}
- Appendix 8 – Bridger Mountain Range Mapping Project (integrated mapping tools to characterize landscapes by any arbitrary list of characteristics; applicable to mapping contamination in soil and water) {40}

j) Annual Report , Montana State University to US DOE, Extension and Enhancement of Methods for Setting Data Quality Objectives, Principal Investigator, Daniel Goodman, 10/01/96 to 9/30/97

– Appendix 1 – Statistical and Cost-Benefit Enhancements to the DQO Process for Characterization Decisions in TWRS {41}
– Appendix 2 – Statistical and Cost-Benefit Enhancements to the DQO Process for Characterization Decisions {42}
– Appendix 3 – Estimating Functions for Variogram Estimation {43}

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– Appendix 5 – Rad Contamination in Bethel Valley {45}

k) Final Report of Montana State University to US DOE, Extension and Enhancement Methods for Setting Data Quality Objectives, Daniel Goodman, March 3, 2000

- Appendix 1 – Documentation of Geostatistical Approach for the Analysis of SX-Farm Vadose Zone Gamma Data {46}
- Appendix 2 – Estimation of SX-Farm Vadose Zone Cs-137 Inventories from Geostatistical Analysis of Drywell and Soil Core Data {47}

Data Quality Objectives (additional references not cited above)

a) The XYZ Planning Process for DOE Environmental Data Collections, Goodman, 1997 (advanced discussion about implementing key steps of the DQO Process, including appendix that applies steps to Piazza Road) {48}
b) Applying DQOs to Hanford Tank-Waste Remediation (C-106); Blacker, Goodman, Clark; Environmental Testing and Analysis, July/August 1994 {49}
c) Risk-Based Decision Making – An Integrated Approach for Efficient Site Cleanup, Environmental Science and Technology, feature, pp 466a-470a, vol 28, 1994 {50}
d) Case Study: Application at a Superfund Cleanup; Blacker and Goodman, Environmental Science and Technology, feature, pp 471a-477a, vol 28, 1994) {51}

Statistical Decision Theory (key references highlighted)

a) Confidence Intervals on an Estimated Cumulative Distribution Where Observations Are Subject to Measurement Error, Goodman, 1990 {52}
b) Report to QAMS on Uses of Bayesian Methods for Computing Confidence Intervals on Environmental Data, Goodman, June 18, 1990 {53}

c) A Monte Carlo Solution for Bayesian Uncertainty Analysis of a Complex Model, Goodman, September 5, 1990 {54}

d) “Statistical and Cost-Benefit Enhancements to the DQO Process for Characterization Decisions in TWRS”, Goodman, Report to DOE Office of Hanford Tanks, June 30, 1996 (similar report to e) below, but focused on Hanford’s highly radioactive underground storage tanks) {55}

e) “Statistical and Cost-Benefit Enhancements to the DQO Process for Characterization Decisions”, Goodman, for US DOE/EM 0316, September 12, 1996 (key reference that contrasts hypothesis testing and statistical decision theory, describes five remediation examples where decision theory would make a difference, describes the mathematics and logic for how statistical decision theory is applied to remediation, and presents an application) {56}

f) “Site Cleanup, Cost and Risk Control”; Goodman and Blacker, Encyclopedia of Environmental Analysis and Remediation, 1998, p 4329-4347 (PRIMARY reference describing problem definition; uncertainty in the data to determine extent of problem, cost uncertainty, balance of cost of more data, value of improved information, cost of remediation action or no action; mathematics to support developed quantitative model; application of quantitative model showing influence of various cost factors on risk-benefit of more information versus action) {57}

g) Application of Decision Theory Methods to the Data Quality Objective Process; Bottrell, Blacker, Goodman; 24th Annual National Energy and Environmental Quality Division Conference; American Society of Quality, 1997 {58}

h) Improvements to Specifying Limits on Decision Errors in the Data Quality Objectives Process; Bottrell, Wentworth, Blacker, Goodman; 24th Annual National Energy and Environmental Quality Division Conference; American Society of Quality, 1997 {59}

i) “Betting on Statistical Inference”, Goodman, July 12, 1999 (a quantitative analysis of the two fundamentally different types of quantitative bases for decision rules – decision theory and hypothesis testing; mathematical justification for decision theory choice) {60}