

The Role of Data Management in Quality Assurance of Ecological Restoration Data

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How can data management and quality assurance planning improve the reliability of data collected for ecological restoration efforts?



Britta Suppes, Joe Magner, Chris Lenhart

Purpose

Show how data management and quality assurance (QA) strategies can *work together* to ensure the quality, reliability, accessibility, and integrity of ecological restoration data



Data Management Plan (DMP) Implementation Model

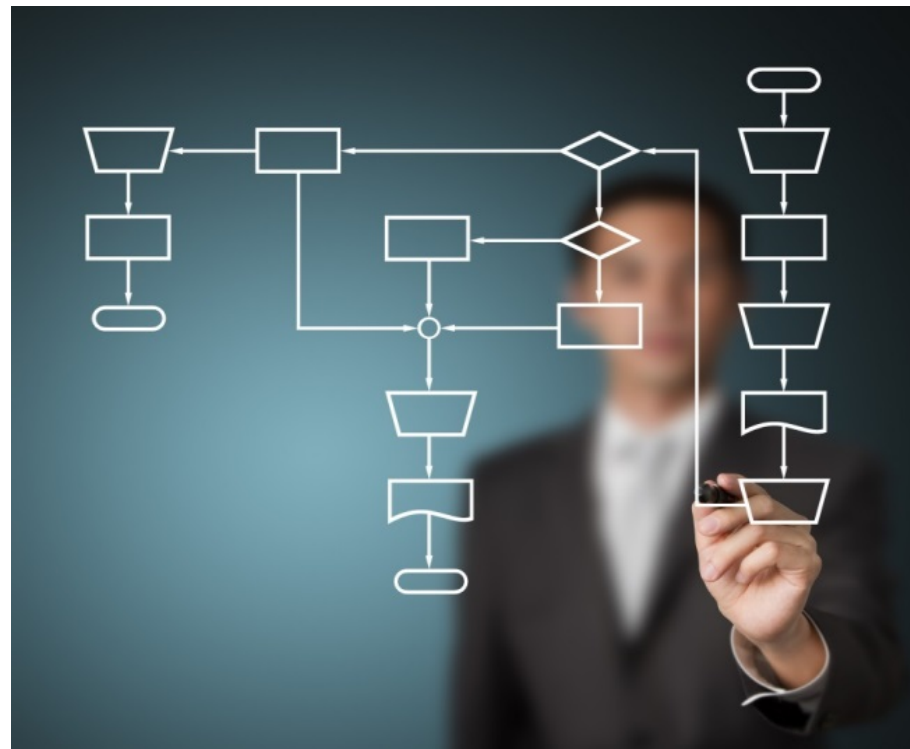


Data Management Plan (DMP) Implementation Model



Project Description, Administration, & Requirements

- Anticipated data & data management products
- Roles & responsibilities
- Project data workflow & associated tasks



Project Description, Administration, & Requirements

Project Planning Topic	Data Management	Quality Assurance
Project Description	Anticipated data and data management products	Data quality acceptance criteria
Project Administration	Roles and responsibilities for data management	Roles and responsibilities for QA oversight
Project Requirements	Project data workflow and associated tasks	QA tasks in support of data management



Brick Fevold

- Standard operating procedures (SOPs)
- Staff training & certification
- Data collection forms

PERCENT COVER CLASSES		
Emergent	Canopy	Suppressed
0	10	0
Height (m) 0	0 not pres	Height 0
Tall Shrub	1 <1%	Groundflora
50	3 1-5%	70
Rock	10 5-15%	Root/Boll
0	20 15-25%	1
Litter	30 25-35%	Down Wood
30	40 35-45%	1
Flowing w	50 45-55%	anding H2O
0	60 55-65%	0
	70 65-75%	
	80 75-85%	
	90 85-95%	
same as 73	98 95-100%	

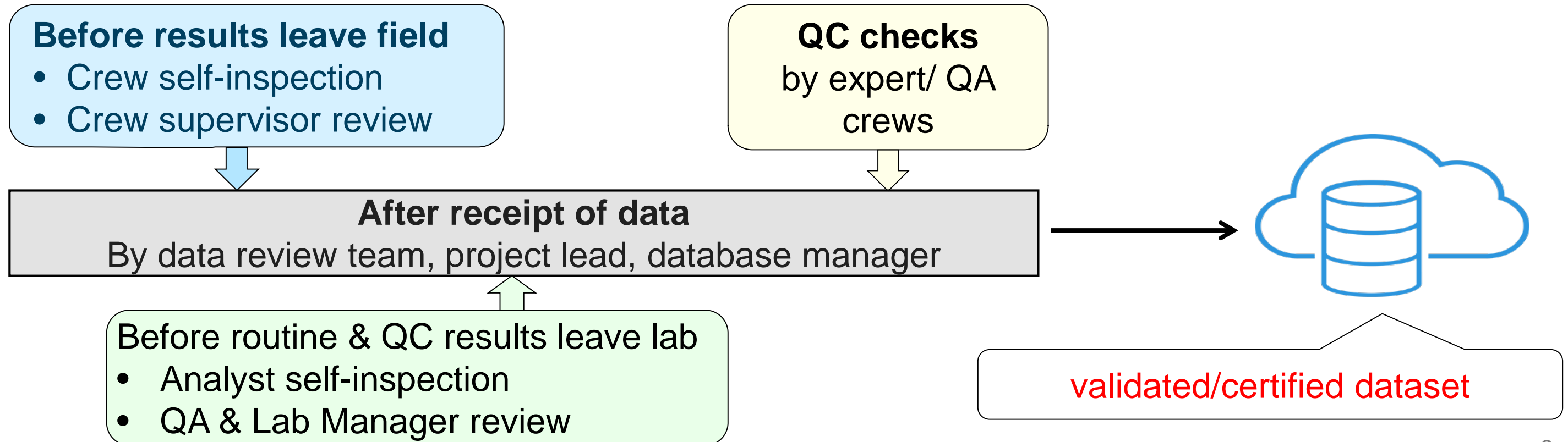
Example by Matthew Struckhoff, USGS

Electronic data forms can provide:

- Pick lists from look up tables
- Range checks
- Completeness checks
- Auto-population of specific fields

Data Acquisition & Collection (cont'd)

Project Planning Topic	Data Management	Quality Assurance
Data Review during Data Collection	Data flow & file management for data review	Procedures for data review including field & laboratory QA oversight
Acquisition of Existing (Secondary) Data	Acquisition, input & management of existing data	Source of data, intended use, acceptance criteria, & limitations of use



Field & Lab Data

- Reporting forms
- Field/lab notes & logs
- Raw instrument data
- Voucher specimens
- Video or audio recordings
- Photos
- Sample tracking records
- Training records

Field & Lab QC Data

- Instrument calibration records
- Field QC check findings, reports, forms, logs/notes
- Lab QC sample results
- Audit reports

Procedural tools

- Tailored to method, program and/or project
- Guidelines, SOPs, Variable-specific tables, checklists
- Sampling/monitoring plan
- Sample location maps
- Field guides, lists, keys, code definitions

Data Organization & Security

Project Planning Topic	Data Management	Quality Assurance
Data Organization	File structure & database	Include QC data & QA documentation in database design
Data Security	Storage, backup, & restore procedures	Ensure data integrity by reviewing & testing data security procedures



- **Processing:** procedures for all data types*
 - Transcription: procedures to transfer data from hard-copy forms to database
 - Review: automation of data verification & validation procedures
 - Certification: procedures to certify the validated database
- **Analysis:** data reduction, metric calculation, data manipulation (e.g., models, statistics)

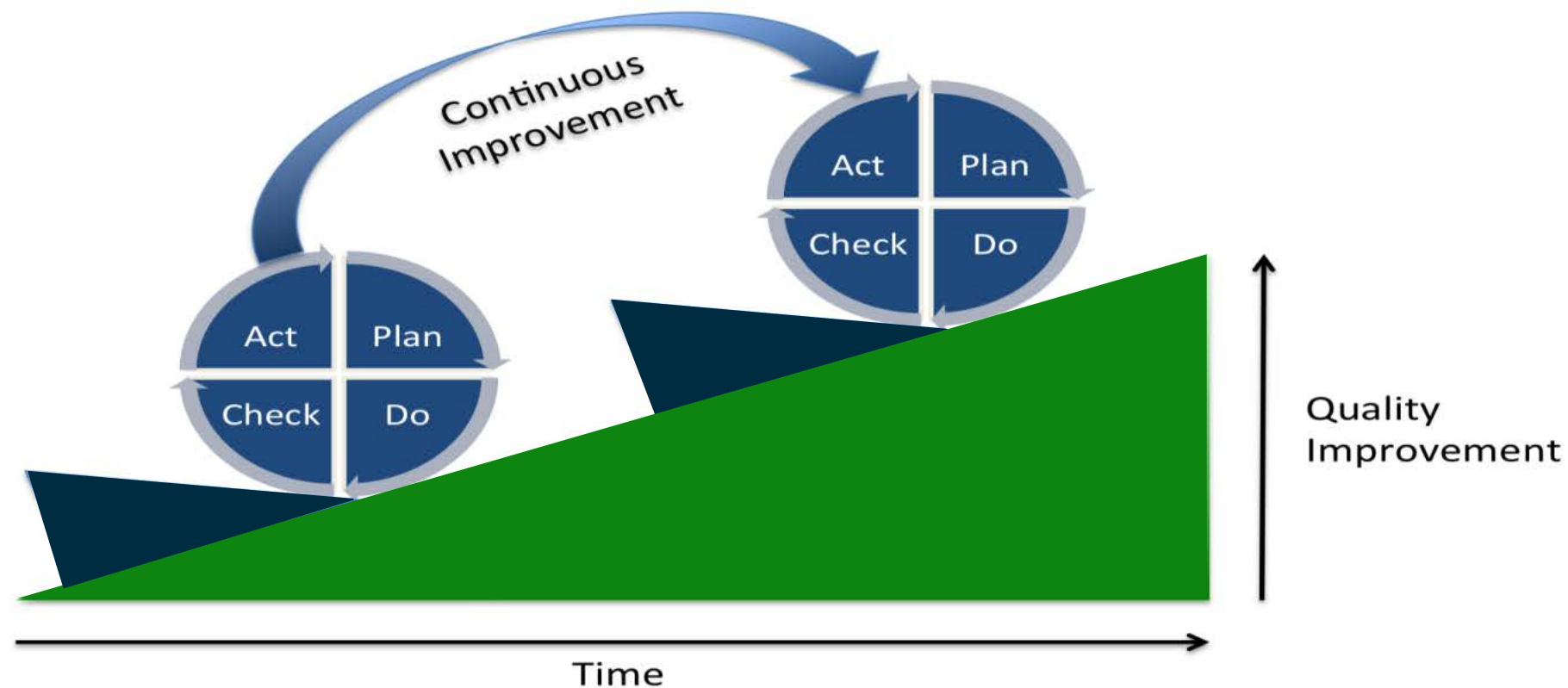
*e.g., field observations, field instrument data, GPS, digital photos, samples & vouchers, lab results and QC data

- **Metadata standards:** templates & content standards to apply
- **Metadata creation:** documentation for all data, including QC data
- **Archiving:** procedures for archiving all data, reports, & quality documentation

Completeness & Compliance QA Review

Data Sharing & Re-use

Project Planning Topic	Data Management	Quality Assurance
Data Sharing	Procedures that guide internal & external data sharing	Ensure that data are accessible
Re-use	Procedures to obtain, document & respond to user comments	Provide for continuous improvement & encourage user feedback

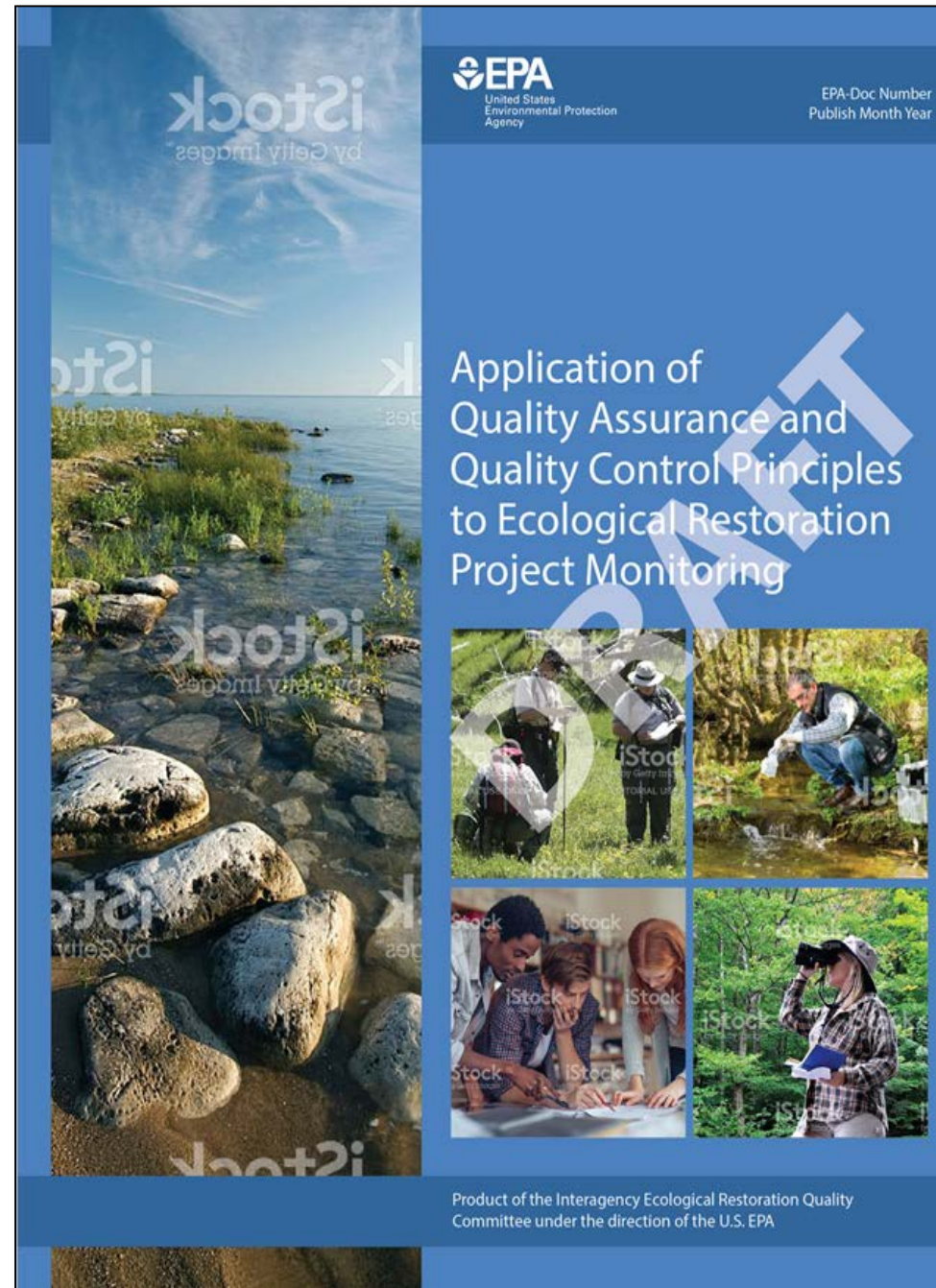




My Experience

- 1) QA plan with a section on data management
- 2) Data management plan with a section on QA
- 3) Separate data management & QA plans





Is there a way to combine detailed data management planning with detailed quality assurance planning?



Thank You!

Please send all comments and questions to:

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