

WaterSim Codebook

CODE FIRST: *Interaction codes (see Bales 1951 for code definitions)*

BM/R Solidarity/Shows antagonism
BM/R Tension release/Shows tension
BM/R Agreement/Disagreement
BM/R Gives suggestion/Asks for suggestion
BM/R Gives opinion/Asks for opinion
BM/R Gives orientation/Asks for orientation

CODE SECOND: *Information Sources*

R-3 Experience
R-3 Belief
R-3 Knowledge
R-4 Boundary object

BM-4 Boundary manager
BM-4 Script (Science representative)

CODE THIRD: *Substantive Codes*

Reconciling Supply & Demand paper:

R-5 Unsupplied information
R-5 Supplied information
R-5 Undemanded information
R-6 Demanded information
R-6 (*Subcode*) Externally demanded info
R-6 (*Subcode*) Internally demanded info
R-7 Boundary-demanded info

Knowledge systems for sustainable development paper:

R-8 Data (+/-)
R-8 Calculations (+/-)
R-8 Display (+/-)
R-9 Scientific validity (+/-)
R-9 Bias (+/-)
R-9 Respect for values (+/-)
R-10 Adopt
R-10 No adopt
R-10 Would adopt

Modernity & vulnerability paper:

R-11 Consumption
R-11 Conservation
R-12 Supply-side
R-12 Demand-side
R-13 Vulnerability
R-13 Resilience
R-13 Robustness

Uncertainty codes

R-14 Scientific
R-14 Political
R-14 Climatic
R-15 Model (also Communication)
R-15 Model (+/-)

General boundary work codes:

R-16 Boundary spanner
R-16 Boundary skills
R-16 Boundary ordering processes
R-17 Differing priorities
R-17 Science-policy interface – linear
R-17 Science-policy interface – recursive

Guiding Principles for WaterSim coding

GENERAL PRINCIPLES:

- 1) HOW TO CODE: You only need three resources to code: (1) the WaterSim codebook, (2) the Bales 1951 interaction codes guide, and (3) the WaterSim script. Do not use knowledge outside of these three sources (other than basic knowledge of English language semantics) in your coding.
- 2) WHO TO CODE: All text from the boundary manager (BM) and the respondent (R) should receive an interaction code. All text from the BM and the R should receive an information source, unless it lacks content, but BM and R have different information codes. Only text from R is eligible to receive a substantive code, but not all text will be pertinent to all code areas.
- 3) WHAT TO CODE: Code only the text. Do not read into the language for hidden subtext. Do not code the nonverbal interactions as text. (However, you may use the italicized nonverbal interactions to inform how you code the text.) For the individual responses, code comments to Tim.
- 4) WHERE TO CODE: The unit of analysis for this project is a paragraph of text. For individual responses or focus group comments, one 'paragraph' (or continuous block of text) should be the only coding unit used. There is one exception: if, in the focus group discussion, someone is interrupted and completes their idea later, you should highlight all those comments once (that is, both paragraphs and the intervening comment).

PRINCIPLES FOR CODING INTERACTIONS:

- 1) All text, from the boundary manager (BM) and the respondent (R), gets an interaction code.
- 2) Choose the appropriate code (1-12) from Bales' central column of codes
- 3) Look to the right-hand column (a-f) to find the problem area that corresponds to your code in the key below; verify that the problem described is appropriate for your interaction.
- 4) Look to the left-hand column (a-d) to find the emotional/task area that corresponds to your selected code in the key below; verify that the emotion/task described is appropriate for your interaction. If your code passes all verification, assign the code. If not, start again at step 1.
- 5) Do not code *italicized* nonverbal interactions. Nonverbal interactions should be coded directly from the video recordings of the sessions, in Atlas, using the Bales 1951 codes.
- 6) Note that, while the unit of analysis is the paragraph, one paragraph may contain numerous interaction codes.

PRINCIPLES FOR CODING INFORMATION SOURCES:

- 1) All text, from the boundary manager (BM) and the respondent (R), gets an information source code, with one exception: if a statement has no substantive content, you may forgo the information source code.
- 2) There are difference sets of information source codes for the BM and the R.
BM source codes: Boundary manager, Script (Science representative)
R source codes: Experience, Belief, Knowledge, Boundary object
- 3) If you are unsure about which code refers to a segment of BM's text, refer to the WaterSim script. Anything that is not in the script is attributed to the boundary manager. Note, however, that the BM often repeats segments of scripted text during the focus group discussion period.
- 4) If you become confused about which code refers to a segment of R's text, use a process of elimination to find the correct code.
- 5) Note that the Bales code for "opinion" often, but not always, co-occurs with the information source code for "belief".
- 6) Note that for the individual responses; do not use the 'boundary object' code because responses directly refer to the boundary object.

PRINCIPLES FOR CODING FOR SUBSTANTIVE INFORMATION:

- 1) Only text from R is eligible to receive a substantive code, but not all text will be pertinent to all substantive code areas.
- 2) Note that some sets of substantive codes frequently co-occur, have similar meanings, and must be coded for carefully, such as:
 - various boundary-related codes
 - knowledge systems and boundary-related codes
 - knowledge systems and uncertainty codes
 - uncertainty and boundary-related codes
 - various reconciling supply and demand codes

Variable name experience
Theory area knowledge/belief/experience (3)
Detailed description information gleaned from participation in events or activities
Inclusion criteria statement of information that results from direct participation in events or activities; about witnessing, participating in, or having past familiarity with something
Exclusion criteria knowledge or beliefs
Typical exemplars “In my workplace, we tried making a model like this and...”; job-related comments or personal anecdotes
Atypical exemplars
Close but no

Variable name belief
Theory area knowledge/belief/experience (2)
Detailed description statements that are made or information that is accepted without the need for proof or evidence; opinions, convictions
Inclusion criteria participants supply non-factual information/statements; statements that are assessments or judgments of the subject matter
Exclusion criteria knowledge or experience
Typical exemplars I just have to believe we’ll have enough water; we’ll find a way to get water; humans are more important than animals
Atypical exemplars limiting growth will work
Close but no

Variable name knowledge
Theory area knowledge/belief/experience (1)
Detailed description information defined as a collection of facts and data; what is known by study, memorization, etc; can include explicit comments on numbers and no uncertainty about the information
Inclusion criteria participants supply factual information about water/water management (like what would go in an encyclopedia)
Exclusion criteria factual information that is not supplied by participants; information that is not factual (something that would not go in an encyclopedia)
Typical exemplars hydrology, ecology of Colorado River,
Atypical exemplars management institutions such as water law and agency missions
Close but no

Variable name Boundary Object
Theory area Boundary work (2)
Detailed description WaterSim, WaterSim sessions, information behind WaterSim, or the Decision Theater
Inclusion criteria any comment to or about the boundary object, sessions or displays related to the model, parts of the underbelly of the model
Exclusion criteria comments about something they were told about the boundary object
Typical exemplars when participant says, “The model indicates/shows...”, when participant likes the graph
Atypical exemplars discussion of how the DT sessions feedback into the modeling process
Close but no Comments about other boundary objects like WaterSim

Variable name Boundary Manager
Theory area Boundary work (1)
Detailed description interaction between boundary manager and the participants that are not directly informed by BOB or scientist
Inclusion criteria boundary manager error, participant states “I assume (without confirmation from boundary manager)”, BMan deflects questions from participants
Exclusion criteria scientist told the manager to say, i.e. in the script
Typical exemplars “That’s a Tim question”, error, anything not in the script
Atypical exemplars input from the control room
Close but no non verbal interactions off script

Variable name Script (Science representative)
Theory area Boundary work (3)
Detailed description all of the information supplied by scientific contributors to WaterSim, representing the science-side of science-policy interaction
Inclusion criteria any piece of scientific information that is scripted into the presentation
Exclusion criteria any information not scripted into the presentation
Typical exemplars introduction to the model, scripted scenarios, data collection protocol, scripted prompts
Atypical exemplars input from project scientists during presentation/group discussion
Close but no n/a

Variable name Unsupplied Information
Theory area Reconciling Supply & Demand (1)
Detailed description Scientific information not supplied by DCDC during the WaterSim presentation and/or focus group
Inclusion criteria Scientific information that participants state is not presented to them during the DT presentation and/or focus group by DCDC
Exclusion criteria Does not include information that is not scientific
Typical exemplars asks a question about how the model works or what is in it, “I don’t see or hear...”, statement that a piece of information is not included in the BOB or supplied by BMan
Atypical exemplars expression that better information is available and has not been included
Close but no statement that non-scientific information (such as values or bias) is not included in the BOB or supplied by BMan

Variable name Supplied Information
Theory area Reconciling Supply & Demand (2)
Detailed description Scientific information supplied by DCDC during the WaterSim presentation and/or focus group
Inclusion criteria Scientific information that participants state is presented to them during the DT presentation and/or focus group by DCDC
Exclusion criteria Does not include things that are not presented to them, including things that people extrapolate, say was presented to them before, or that one of the participants tells them
Typical exemplars “I see or hear...”, repetition of any fact stated by the BMan or displayed in the BOB
Atypical exemplars discussion of slider bars
Close but no extrapolation about what data may be behind the graphs

**NOTE: The supplied/unsupplied information codes both deal with the speaker’s perception of what is in the model, rather than the reality. We code what has actually been presented to them using the Boundary Manager/Script codes.

Variable name Undemanded Information
Theory area Reconciling Supply & Demand (3)
Detailed description Scientific information that participants express that they do not want or need from DCDC as part of the WaterSim presentation and/or focus group
Inclusion criteria Scientific information that participants state they do not want or need from DCDC as part of the WaterSim presentation and/or focus group
Exclusion criteria Statements that participants do not want information from other participants or about topics that are not scientific
Typical exemplars “I don’t want/need to see/know...”, about Maricopa County, compressed GPCD graph, stocks & flows
Atypical exemplars when people don’t want to use the slider bars
Close but no desire to not discuss bias statement that they would like to see it but don’t have time now

Variable name Demanded Information
Theory area Reconciling Supply & Demand (4)
Detailed description Scientific information that participants EXPLICITLY STATE that they want or need from DCDC as part of the WaterSim presentation and/or focus group; REQUEST FOR INCLUSION in the model/presentation
Inclusion criteria statement that participant would like to know a fact or see something included in the BOB
Exclusion criteria non-scientific information demands and non-explicit requests for information; ASKING FOR REPETITION
Typical exemplars asks for clarification of what's in the model, "I want/need to see/know...", "Please include X in the model in the next iteration...", adjustable GPCD, groundwater recharge, wet years, specific geographic scales or regions
Atypical exemplars desire to see the data or spreadsheet or model behind the graphs
Close but no desire for information that is not scientific such as values or bias, when people assume that something is present

***NOTE: If you use the 'Demanded information' code, you must use one of the two subcodes below (External or Internal demanded information), regardless of any other codes you use.

Variable name External demanded information
Theory area RSD
Detailed description Scientific information that participants state they want or need from DCDC as part of the WaterSim presentation and/or focus group that is not included in the model
Inclusion criteria statement that participant would like to know a fact or have additional information about something that is not included in the model
Exclusion criteria non-scientific information demands and non-explicit requests for information; information demands that are included in the model, but that are not shown to participants during a session
Typical exemplars natural recharge, price information, conservation policies
Atypical exemplars effectiveness of cloud seeding, acquisition of additional supplies of water
Close but no climate scenarios, intDem

Variable name Internal demanded information
Theory area RSD
Detailed description Scientific information that participants state they want or need from DCDC as part of the WaterSim presentation and/or focus group that is included in the model that may or may not be explicitly shown.
Inclusion criteria statement that participant would like to know a fact or have additional information about something that is included in the model, but not clear or shown directly.
Exclusion criteria non-scientific information demands and non-explicit requests for information; information demands that are not included in the model.
Typical exemplars water surplus scenarios, underlying land use maps, data from BOR, USGS, DES, MAG, other.
Atypical exemplars model assumptions: GPCD, groundwater as it is presented.
Close but no

2 x 2 GUIDE TO USING THE RSD CODES

		Yes	No
		SUPPLY	
D E M A N D	Y e s	Says good things about the model as is... “I like how the model has X.” “You should keep X in there.”	“Why didn’t you put X in the model?” “Is X in the model?” “There’s better data/modeling mechanics out there.” “You are missing key variables.”
	N o	“Take that out” “I don’t like it” “Why is that in there?”	“You didn’t put X in there and that’s a good thing because it doesn’t belong in there.”

****NOTE:** You CAN use a supply code without the complementary demand code (or vice-versa), but TRY to use them together. However, you should not force it if not appropriate.

Variable name	Boundary demanded information
Theory area	RSD
Detailed description	information that participants state they want or need from DCDC as part of the WaterSim presentation and/or focus group <u>that is about the boundary</u> , information about how the DCDC/WaterSim research process works
Inclusion criteria	Anything about the way the boundary between science and policy is negotiated; <u>but ONLY within DCDC, DT, ASU, or WATERSIM</u>
Exclusion criteria	IntDem, ExtDem
Typical exemplars	“Who is Tim?”; “Who is Susan?”; “What kinds of scientists were involved in making this model?”
Atypical exemplars	“What is DCDC?”
Close but no	Discussions of stakeholders (eg., “SRP does substandard water delivery work” “MAG is a great agency.”

NOTE: The boundary-demanded code is MUTUALLY EXCLUSIVE with the Demanded (Internal/External) codes; Do not use them together.

Variable name Data (+/-)
Theory area Knowledge systems - Credibility (1)
Detailed description the data that the model uses to run scenarios—code for comments that are positive or negative; REFERS ONLY TO NUMBERS IN A MATRIX
Inclusion criteria anything that comes in a dataset
Exclusion criteria anything that does not come in a dataset
Typical exemplars historical data, DES data, SRP data, CAP data, ‘data’
Atypical exemplars gross GPCD estimate
Close but no time scale on a slider bar

Variable name Calculations (+/-)
Theory area Knowledge systems - Credibility (2)
Detailed description decision rules for calculations within the model, (i.e. modeling mechanics)—code for comments that are positive or negative; REFERS ONLY TO CALCULATIONS (SCENARIOS, FORMULAS, PROJECTIONS, ESTIMATIONS, COMPUTATION, ALGORITHMS)
Inclusion criteria any parameter that establishes how scenarios are run
Exclusion criteria any comment not about modeling mechanics
Typical exemplars 7 Basin States agreement, stocks & flows, slider bars, Monte Carlo methods, Growth Projection, conservation modeling, projected water conservation, etc.
Atypical exemplars Modeler’s decision to include or exclude a variable
Close but no anomalies in display due to data holes, not modeling

Variable name Display (+/-)
Theory area Knowledge systems - Credibility (3)
Detailed description feedback on the way WaterSim looks—code for comments that are positive or negative
Inclusion criteria graphs, slider bars, color scheme, labels, readability, etc.
Exclusion criteria Asking for CLARIFICATION on a display does not count—only comments/assessments of/opinions on the display
Typical exemplars graphs are too detailed or not detailed enough, floating Y-axis on groundwater graph
Atypical exemplars the graphs have no keys to show data sources
Close but no Feedback on the appearance of the Decision Theater

Variable name Scientific validity (+/-)
Theory area Knowledge systems - Credibility (4)
Detailed description the modeling community's opinion of the scientific adequacy of the model based (esp., accuracy, reliability, precision) —code for comments that are positive or negative
Inclusion criteria participants perceive that the modeling community would accept/reject the model; any statement of the opinion of scientists or modelers about the model or its scenarios
Exclusion criteria any opinion not from a scientist or modeler, "I think the model is relevant"
Typical exemplars "I am a modeler and my opinion is...", "I know a modeler, and their opinion is..."
Atypical exemplars "Tim told me X about the credibility of the model"; It only feels valid when the modeler is here telling me about it
Close but no "I saw the model before and I thought it was really credible then"

Variable name Bias (+/-)
Theory area Knowledge systems - Legitimacy (2)
Detailed description regards whether the model(er) has a preconceived policy goal, perspective, or opinion—code for comments that are positive or negative
Inclusion criteria any statement that the model(er), Borg, Bob, Bman is biased
Exclusion criteria any statement that the model(er), Borg, Bob, Bman is not biased
Typical exemplars talks about bias or agenda explicitly
Atypical exemplars talks about respect for values/beliefs of stakeholders, talks about representing opposing views/interests in Borg, Bob, Bman
Close but no ????

Variable name Respect for Values (+/-)
Theory area Knowledge systems - Legitimacy (3)
Detailed description regards whether the model is/is not respectful of stakeholders' divergent values—code for comments that are positive or negative; must EXPLICITLY address the idea of stakeholder perspective or values
Inclusion criteria Participant says the model is/is not respectful of anything s/he considers to be a stakeholder value, acknowledgement that a stakeholder's perspective has been or is being included in the model (note: we consider this an implicit comment on the model's respect for speaker's values)
Exclusion criteria Participant says the model is not respectful of anything s/he considers to be a stakeholder value
Typical exemplars "I heard that you got SRP's feedback before showing the model the first time." "Model shows conservation and people care about conservation; this is relevant to the needs of my constituency."
Atypical exemplars "I don't know what a stakeholder value would be" (code here: neutral)
Close but no "I like/don't like the model."

Variable name Adopt
Theory area Knowledge systems - Saliency (1)
Detailed description statements that the BOB is useful or successful without further revisions, meets the needs of decision makers
Inclusion criteria participants state they would use model as is
Exclusion criteria can't use it or would need revisions to use it
Typical exemplars model can be used for policy decision making; "the model is relevant"
Atypical exemplars can be used for educational purposes
Close but no "I already adopted something like this"

Variable name No Adopt
Theory area Knowledge systems - Saliency (2)
Detailed description statements that the BOB cannot be used and does not meet the needs of decision makers
Inclusion criteria participants say they cannot use the model (for any reason)
Exclusion criteria participants say that the model can be used for any use whatsoever
Typical exemplars wrong geographic scale, "I don't make decisions about this." "The model is not relevant"
Atypical exemplars "This won't be adopted for political reasons"
Close but no

Variable name Would Adopt
Theory area Knowledge systems - Saliency (3)
Detailed description statements that if changed the BOB would meet the needs of the decision makers, the model could be used if changed
Inclusion criteria participants say they would use the model if it were changed; comments that state the model has potential to inform decision makers of the value of relating patterns of growth and their influence on resource management
Exclusion criteria participants say they would adopt as is or could not adopt under any conditions
Typical exemplars "I would use if you change the geographic scale, add a conservation graph, etc."
Atypical exemplars participant says, "I can't use it in my work, but could be used in another workplace/department"
Close but no participants say they would use the model if it were a completely different model

***NOTE: If you use a Consumption, Conservation, Supply-side, or Demand-side code HERE, you must try to use the Resilience, Robustness, or Vulnerability codes on THAT FOLLOW

Variable name Consumption
Theory area Development approaches (1)—REFERS TO MICRO-LEVEL
Detailed description expression of the idea that more water is needed to support *population growth, quality of life, or other human water needs* (****must mention water**)
Inclusion criteria Discussion of growth and maintaining the quality of life for this growth and discussion of community impacts on the water use at the household level
Exclusion criteria text that should be coded as supply-side, demand-side, and conservation
Typical exemplars growth, residential development, building houses, people’s desire to use water, people should be able to water their lawns as much as they want, “GPCD data is dependent on how residential water is being used at the home” groundwater pumping, farmers, agricultural irrigation, private Water providers.
Atypical exemplars
Close but no

Variable name Conservation
Theory area Development approaches (2)—REFERS TO MICRO-LEVEL
Detailed description EXPLICIT USE of the word “conserve”; discussion of the need for people to behave in ways that preserve present water supplies
Inclusion criteria Discussion of micro-level conservation
Exclusion criteria Text that should be coded as supply-side, demand-side, or consumption
Typical exemplars low-flow toilets, taking out grass, xeriscaping, getting rid of swimming pools
Atypical exemplars
Close but no referring to codifying these changes in a legal framework (i.e., at the macro level)

***NOTE: The consumption code is the reverse of the conservation code. Also, the consumption code can be understood from the demand-side code in that the consumption code concerns personal water use that does not recognize supply is limited, whereas the demand-side concerns water use that does recognize that water supply has limits.

Variable name Supply-side
Theory area Development approaches (3)—REFERS TO MACRO LEVEL (policy)
Detailed description expression of the idea that *we need to make more water* (that is, make more water available, buy more water, create more water, etc.); the need to find *future water supplies* (****must mention water**)
Inclusion criteria Discussion of the need for more water or the ability to acquire water or ARE in the process of acquiring more water
Exclusion criteria Discussion of the need for or the ability to change water use or consumption
Typical exemplars desalination, buying water, getting water rights for the Colorado River
Atypical exemplars groundwater recharge, cloud seeding, reclamation
Close but no xeriscaping, talk about growth that does not mention water

Variable name Demand-side
Theory area Development approaches (4)—REFERS TO MACRO LEVEL (policy)
Detailed description expression of the idea that we need to *make the water we have last* (that is, we need to conserve water); the need to preserve *present water supplies*; expression of the idea that *growth causes over-consumption* (****must mention water**)
Inclusion criteria Discussion of the need to control human behavior to make water last
Exclusion criteria Discussion of the need for or ability to make more water
Typical exemplars pricing structures, new laws, education about water use, discussion of the need to change values
Atypical exemplars
Close but no

***NOTE: to next page's codes on Vulnerability, Resilience, and Robustness:
If the statement is vague and you are unsure if it's appropriate to code for Resilience, Robustness, or Vulnerability, consider the following:

Imagine asking the respondent which of the three concepts best describes their view on the Valley (for the comment you are coding). If you feel sure that you can predict which of the three concepts the respondent will choose, go ahead and code. If you are unsure, do not code it.

NOTE: All three of these codes refer to responses to a stressor (i.e. an environmental hazard, like a drought, climate, change, etc. or urban heat island). If there is no stressor, these codes are not appropriate.

Variable name Vulnerability
Theory area Socio-ecological systems (1)
Detailed description A vulnerable individual, group, or social system can be driven to total structural reorganization, chaos, or extinction by stressors, hazards, or shocks
Inclusion criteria Statements that the system cannot work or will break down
Does the statement refer to the occurrence of a shock, disaster, or collapse – to a total change of lifestyle or policy options in the Valley?
Exclusion criteria System works or could work with adjustments
Typical exemplars unsustainability, running out of water, prohibiting growth, 7 States
Atypical exemplars Yuma saying “don’t count on us to sell you water”
Close but no ????

Variable name Resilience
Theory area Socio-ecological systems (2)
Detailed description A system that is able to adapt to a stressor without changing fundamentally (although function and dynamics may change temporarily); a resilient system is one that can come to rest in multi-stable states and these states can exist in varying degrees of desirability or undesirability
Inclusion criteria Statements that the system will work with adjustments
Does the statement refer to a minor change to life in the Valley or the way that management is done in the Valley?
Exclusion criteria System works perfectly or will break down completely
Typical exemplars graded pricing programs, groundwater use caps, limiting growth, water reclamation, agricultural retirement rates
Atypical exemplars effluent use
Close but no ????

Variable name Robustness
Theory area Socio-ecological systems (3)
Detailed description A robust system does not respond at all to a stressor; the system can maintain all its functions in spite of the stressor
Inclusion criteria Statements that the system will work the ways it is currently designed
Does the statement refer to everything going on as before, to things being the same, or to preserving the current way of life or resource management in the Valley?
Does the system remain the same despite attempts to change it?
Exclusion criteria System will work with adjustments or will break down completely
Typical exemplars continued population growth, “we will always find water”, buying water from Indians, buying water from Yuma
Atypical exemplars “we’ll get water despite the 7 Basin States Agreement”
Close but no ????
Variable name Scientific uncertainty

Theory area Uncertainty
Detailed description Statements about uncertainty in science; the inability of science to render reliable/accurate predictions
Inclusion criteria Any general statements about science & uncertainty
Must explicitly mention science or a scientific concept (e.g., accuracy, reliability, projection, etc)
Exclusion criteria Statements that do not explicitly mention science or a scientific concept (e.g., accuracy, reliability, projection, etc)
Typical exemplars “Climate science just isn’t accurate enough to base decisions on”;
“Science is all probabilities and likelihoods”
Atypical exemplars “The modeling approach used here isn’t reliable”
Close but no

Variable name Political
Theory area Uncertainty
Detailed description uncertainty about political actors and events that influence water management decision making
Inclusion criteria *Specific comments about uncertainty due to unknown future events tied to local, state, or federal government agencies, or other stakeholders* (e.g., conservation organizations, water suppliers) and/or their leaders that influence the political and legal aspects of water management decision making
Must name specific policies, laws, agencies, or actors
Exclusion criteria *general* comments about political aspects of water management decision making
Typical exemplars “if the Governor’s office changes parties, then anything we think about the model will be up in the air because our department head will change and who knows what the priorities will be then” “if the model is taken to [political actor], then it may influence future planning”
Atypical exemplars “the Governor’s office will have a lot to say about this model”
Close but no

Variable name Climatic
Theory area Uncertainty
Detailed description uncertainty about climate change that influences water management decision making
Inclusion criteria *Specific comments about uncertainty or unknown effects that climate change* (also ‘global warming’ or ‘greenhouse effect’) will have on water management decision making
Exclusion criteria *general* comments about climate change and how it is represented in the model
Typical exemplars “well, we just don’t know if the climate in the southwest will warm by 1 degree or 4 degrees, and that really limits what we can do in terms of planning”
Atypical exemplars “the model should use the IPCC climate change scenarios”
Close but no

Variable name Model (also Communication uncertainty)
Theory area Uncertainty
Detailed description Strategies, techniques, or methods to communicate uncertainty
Inclusion criteria Comments about how to convey the existence and magnitude of uncertainty in the model
Exclusion criteria comments about uncertainties *not* represented in the model
Typical exemplars “if the model could quantify how likely or unlikely these scenarios are, it would be more helpful”; “I think you should include error terms that tell people the range of possibilities”
Atypical exemplars “It’s better to keep the uncertainties buried in the model”
Close but no *pol, clim*

Variable name Model (+/-)
Theory area Uncertainty
Detailed description positive or constructive outcomes of uncertainty in the model
Inclusion criteria comments about the positive/constructive or negative/destructive consequences of uncertainty in the model
Exclusion criteria *general* comments about the existence of uncertainty
Typical exemplars “uncertainty at least provides everyone with an opening to talk about the future”; “there is so much uncertainty in this model, it is really worthless”
Atypical exemplars “the uncertainty in the model is useful to help our discussions”
Close but no *pol, clim, comm*

***NOTE: Do not use the boundary codes unless the speaker is talking about BOTH science and policy, preferably in an explicit way

Variable name Boundary spanner
Theory area Boundary work
Detailed description person (participant or other) whose job includes translating, facilitating, or negotiating between scientific and political sectors
Inclusion criteria comments about *bspan* (self or other); must mention both science and policy
Exclusion criteria comments about *bman*, *bob*
Typical exemplars “it’s my (his/her) job to translate/communicate scientific/political information to...”
Atypical exemplars “I (he/she) don’t/doesn’t deal with politics/science”; “Thank goodness, I don’t have to work in that arena”
Close but no *bman*, *bob*, *script*

Variable name Boundary skills
Theory area Boundary work
Detailed description skills, training, education, personality traits of a successful boundary spanner
Inclusion criteria comments about what makes someone a successful boundary spanner
Exclusion criteria comments about what makes someone an unsuccessful boundary spanner
Typical exemplars “he/she is really good at dealing with political decision makers b/c he/she isn’t stuck in the ‘ivory tower’”
Atypical exemplars “can’t work with politicians/scientists”
Close but no

Variable name Boundary ordering processes
Theory area Boundary work
Detailed description processes or events, such as water briefings, data sharing, and personnel sharing that provide a forum for interactions between scientists and policy actors
Inclusion criteria *discussion about places or events that bring people together to do boundary work* (i.e. forums, events, or mechanisms that specifically bring together scientific and political actors to discuss or negotiate priorities & information needs)
Exclusion criteria comments about events are processes that do not include multiple actors from scientific and political communities
Typical exemplars “it would be helpful to have a meeting in the DT with the scientists and the agency folks together to talk through the model”; Any mention for Tim or another DCDC worker to contact the participant to discuss the model in more detail.
Atypical exemplars “we need to get this model back to the agency so our people can evaluate it alone”
Close but no

Variable name	Differing priorities
Theory area	Boundary work
Detailed description	priorities of scientists or policy makers; those policies, strategies or actions that are deemed important and timely
Inclusion criteria	comments about the differences or distinctions in priorities between scientists and policy makers
Exclusion criteria	comments about priorities of science or policy <i>without</i> an implicit or explicit comparison to the other group
Typical exemplars	“scientists are worried about writing articles and making tenure, but policy makers have to think about making actual decisions”
Atypical exemplars	“the only priority for me is getting the model correct”
Close but no	

***NOTE: In using these two codes, pay close attention to (1) actions and (2) actors. You should (1) confirm that an action or interaction is being discussed and (2) count the number of actors named (explicitly or implicitly) as you proceed.

Variable name	Science-policy interface – linear
Theory area	Boundary work
Detailed description	linear model of scientific advice to policy making; political problem definition > scientific research > political decision making
Inclusion criteria	<u>To be explicitly linear, only one exchange of information (from point A to point B) can be mentioned</u> Implicitly linear comments may mention “science/scientific information is produced in a vacuum”; “policy makers are the ones who consider values when making decisions”
Exclusion criteria	comments about <i>recur</i> model of science-policy interactions
Typical exemplars	“science speaks truth to power”; “science is helpful in figuring out the possible alternatives, but the policy makers have to make the ultimate decisions”
Atypical exemplars	comments coded as <i>recur</i>
Close but no	

Variable name	Science-policy interface – recursive
Theory area	Boundary work
Detailed description	iterative model of ‘co-production’ of science and policy; policy influences what science gets done and science influences how policy decision are made
Inclusion criteria	<u>To be explicitly recursive, more than one exchange of information must be mentioned (e.g., from point A to point B to point A again)</u> Implicitly recursive comments may mention: “science and policy are linked”, “science and policy influence one another”, “science and policy are not separate by a sharp line”
Exclusion criteria	comments about <i>lin</i> model of science-policy interactions
Typical exemplars	“science and policy are inseparable”
Atypical exemplars	comments coded as <i>lin</i>
Close but no	