Appendix B: NiNMoM Working Definition of *Data Literacy*
Summary of teacher–scientist workshop discussion

1. **What knowledge, skills, and abilities (KSAs) does everyone need to know (about data and working with data) when they graduate high school?**
   a. Life skill _____ approaches
      1. Determination/perseverance in looking at graphs and data sets
      2. Don't rely on Google
      3. Teamwork and where to go for help
   b. Interpretation
      1. Sources of bias
      2. Error and uncertainty
      3. Asking questions about the data
      4. Solving equations
      5. Linear regression
      6. Finding the best representation of a data set
      7. Knowing purpose and type of analysis
      8. Establish confidence in interpretation
      9. Meta-analysis
   c. Specific minimum (?) skills
      1. Understanding data background and history
      2. Comparative analysis
      3. Data vocabulary
      4. Presentation of analysis
      5. Baseline data process techniques
      6. Matrix/matrices
      7. Math language

2. **What do all people need for their life (regarding data)?**
   a. Being comfortable with uncertainty
   b. Basic data analysis
   c. Correlation versus causation
   d. Definitions of *theory* versus *hypothesis*: How data and evidence fit into this understanding
   e. Understanding models (strengths, limitations, and how they are created)
   f. Basic correlational statistics
   g. Connecting data and interpretation to life and choices
   h. Recognizing we all have an impact on data
   i. Adaptive management
   j. Recognizing what is an accurate representation of data and what is not

k. Baseline computer proficiency
l. Open mindset
m. Basic interpretation skills
n. Statistics and data vocabulary understanding
o. Critical thinking for citizenship
p. Understanding biases associated with data
    1. Misleading graphs or statistics
    2. Same data, but different conclusions
q. Ability to see patterns and draw conclusions from data presented in sources of life
r. Ability to understand information presented by "experts" (e.g., doctors and media)

3. **What do people in STEM fields need for their work?**
    a. Character traits
        1. Curiosity
        2. Drive to investigate problems
        3. Flexibility to respond to changing/evolving knowledge and problems
        4. Collaborative mindset
    b. Skills
        1. Critical thinking skills
        2. Able to be aware of self-bias, beliefs, and values
        3. Technological literacy
        4. Communication
        5. Organization
        6. Math literacy
    c. Content knowledge
        1. Interacting with areas outside of expertise
        2. Appreciation of other fields
        3. Good understanding of problems at hand
        4. Ethics
    d. Training and access to resources
        1. Professional development
        2. Adequate resources
        3. Creativity of resources, integration, and ideas
        4. Data management (storing and backing up data)

4. **If "regular" literacy is reading and writing, then what is data literacy?**
    a. Understanding and communicating natural systems
    b. Appreciation of complexity of systems
    c. Assessing limits of inference of data sets

d. Assessing data validity
e. Interpreting data
f. Gathering meaning from data
g. Ability to present data to multitude of audiences
h. Statistical analysis
i. Making sense of and knowing the difference between quantitative and qualitative data
j. Understanding data vocabulary
k. Understanding how and where data come from
l. Being able to think critically about data
m. Understanding there are many ways to interpret data
n. Being able to tell a story by connecting data to context and personal reality
o. Ability to correctly interpret and present data (e.g., making and understanding graphs)
p. Observations (inferences/implications)
q. Understanding limitations of data
r. Interpretation of appropriate generalizations

5. **What are barriers and constraints to achieving data literacy?**
   a. Lack of training (i.e., background and statistical)
   b. Time
   c. Technological literacy
   d. Figuring out strategies to analyze and interpret data
   e. Lack of emotional buy-in
   f. Lack of teacher confidence in numbers affects students' views of numbers
   g. Helping students understand how it is relevant to their lives
   h. Finding a natural and not forced method of incorporating data into a unit
   i. Data interpretation can be messy
   j. Diverse student ability
   k. Teaching data analysis and interpretation to students
   l. Finding data sets relevant for certain subjects
   m. Resource availability