1. Modeling

- Draft a diagram of model processes.
- Create a list of parameters needed in the model to accompany diagram.
- Identify preliminary estimates or data sources for parameters.
  - Note parameters that are particularly crucial.
  - Note parameters that should be sampled from distributions for variation.
- Review diagram and parameter list with stakeholder and fill in gaps.
  - Particular attention should be paid to the most crucial parameters.
- Develop prototype version of model.
- Write tests to catch inconsistencies in real-time data streams.
- Develop model to use distributions instead of point estimates for key parameters to enable what-if questions and sensitivity analyses.
- Test model and quantify problems caused by missing/-outdated data; share with client to expedite data requests.
- Develop a model animation to illustrate the model process.
  - Particularly useful to develop early in modeling process when collaborating with stakeholders who are unfamiliar with ABMs.

2. Scaling

- Estimate computing needs before the project starts and when determining the budget.
  - Computing needs should consider batch processing and parallel computing opportunities.
- Start building computing infrastructure early.
- Only use Spot instances to save money if your workloads are fault-tolerant and flexible; otherwise, dedicated instances are worth the extra cost.
- Automate repetitive tasks that don't require an analyst in the loop.
Don’t automate tasks that aren’t well suited for automation (fragile, ever-changing, or requiring an analyst in the loop).

3. Reporting

- Create a list of outputs from the model.
- Review list of outputs with client and determine which are most useful for deliverables, how they might be delivered (e.g., Excel, PowerPoint, Tableau, animation), and what visualizations might be used.
- Create prototype deliverables.
- Receive feedback from client on prototype deliverables.
  i. Show the deliverables early in the project
  ii. Iterate as necessary on prototypes
- Upon creation of a final version, consider investing in automation of the deliverable generation process.
  i. Open-source packages from Python are particularly useful for PowerPoint and Excel automation

4. Documentation

- Use a version control tool like Git, including features like issues, branching, and wikis.
- Document early and rigorously.
- Require review of updated documentation as a part of code review.
- For agent-based models, start writing the ODD early and keep it updated when new features are added.

5. Stakeholder engagement/buy-in (incl. animations)

- Determine core group of technical team members and stakeholders and decide on a regular meeting schedule.
- Share agendas before meetings and notes and action items after meetings.
- Use management tools like org charts to manage change in the team over time.
- Set expectations early for deliverable schedule and timeline of incorporation of stakeholder feedback.
- Create a user-friendly visualizations to clearly communicate model behavior with stakeholders.