

Working Group on *Regional Climate Modeling*

Linkages to the FUTURE Science Plan

1. What determines an ecosystem's intrinsic resilience and vulnerability to natural and anthropogenic forcing?

1.1. What are the important physical, chemical and biological processes that underlie the structure and function of ecosystems?	Moderate to high
1.2. How might changing physical, chemical and biological processes cause alterations to ecosystem structure and function?	Moderate to high
1.3. How do changes in ecosystem structure affect the relationships between ecosystem components?	Low
1.4. How might changes in ecosystem structure and function affect an ecosystem's resilience or vulnerability to natural and anthropogenic forcing?	Low
1.5. What thresholds, buffers and amplifiers are associated with maintaining ecosystem resilience?	Low
1.6. What do the answers to the above sub-questions imply about the ability to predict future states of ecosystems and how they might respond to natural and anthropogenic forcing?*	Low

2. How do ecosystems respond to natural and anthropogenic forcing, and how might they change in the future?

2.1. How has the important physical, chemical and biological processes changed, how are they changing, and how might they change as a result of climate change and human activities?	High
2.2. What factors might be mediating changes in the physical, chemical and biological processes?	High
2.3. How does physical forcing, including climate variability and climate change, affect the processes underlying ecosystem structure and function?	High
2.4. How do human uses of marine resources affect the processes underlying ecosystem structure and function?	Low
2.5. How are human uses of marine resources affected by changes in ecosystem structure and function?	Low
2.6. How can understanding of these ecosystem processes and relationships, as addressed in the preceding sub-questions, be used to forecast ecosystem response?	Moderate to high
2.7. What are the consequences of projected climate changes for the ecosystems and their goods and services?	High

3. How do human activities affect coastal ecosystems and how are societies affected by changes in these ecosystems?

3.1. What are the dominant anthropogenic pressures in coastal marine ecosystems and how are they changing?	Moderate to high
3.2. How are these anthropogenic pressures and climate forcings, including sea level rise, affecting nearshore and coastal ecosystems and their interactions with offshore and terrestrial systems?	Moderate to high
3.3. How do multiple anthropogenic stressors interact to alter the structure and function of the systems, and what are the cumulative effects?	Low
3.4. What will be the consequences of projected coastal ecosystem changes and what is the predictability and uncertainty of forecasted changes?	Moderate to high
3.5. How can we effectively use our understanding of coastal ecosystem processes and mechanisms to identify the nature and causes of ecosystem changes and to develop strategies for sustainable use?	Moderate