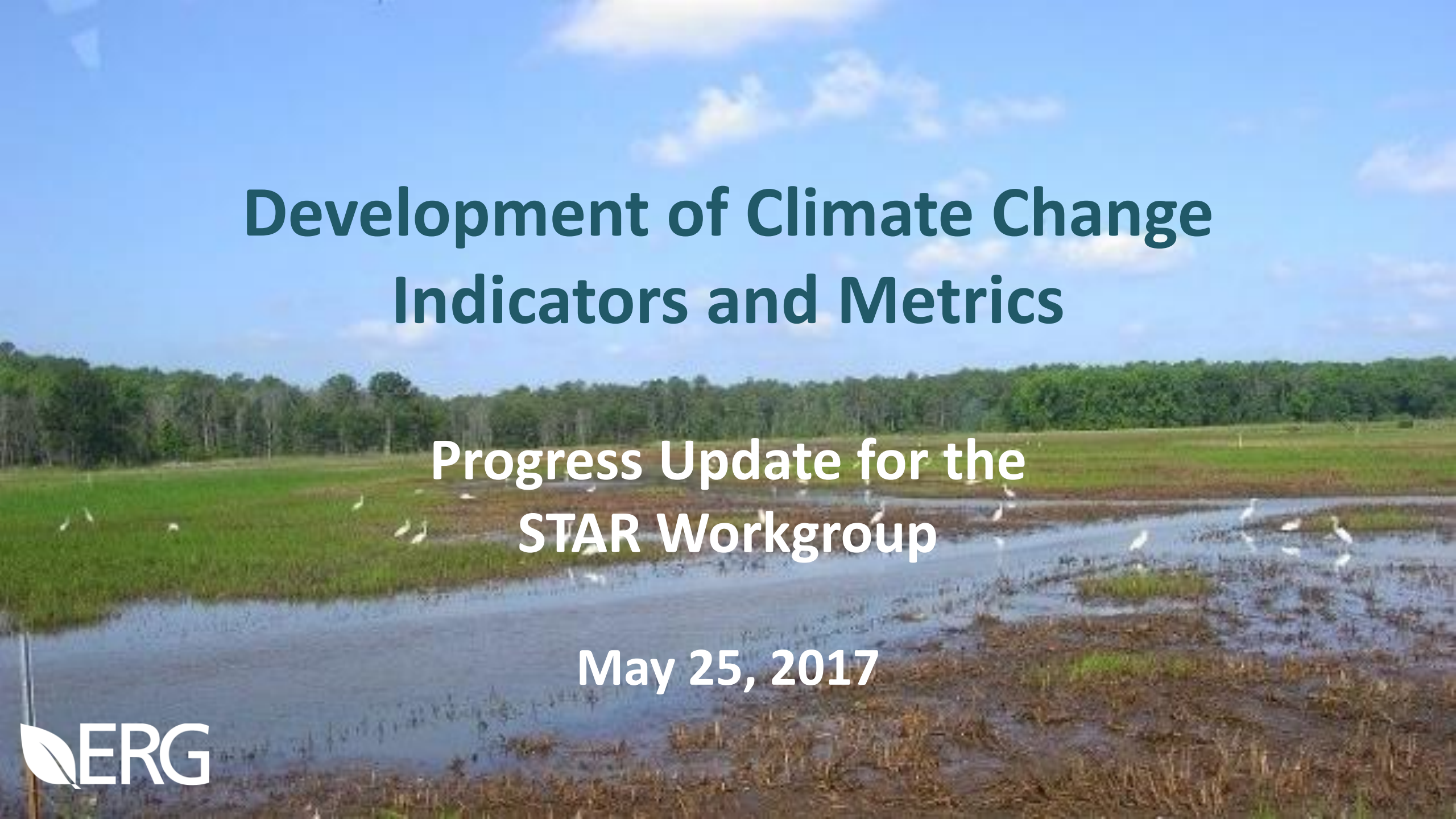

Development of Climate Change Indicators and Metrics

Progress Update for the STAR Workgroup

May 25, 2017

ERG

Project Goals

- Develop a suite of climate-related indicators that can be used to track and analyze trends, impacts, and progress towards advancing “climate resiliency.”

- Specifically, be able to track progress towards the climate resiliency goal in the 2014 Watershed Agreement:
  - **Goal:** Increase the resiliency of the Chesapeake Bay watershed, including its living resources, habitats, public infrastructure, and communities, to withstand adverse impacts from changing environmental and climate conditions.
    - **Monitoring and Assessment Outcome**: Continually monitor and assess the trends and likely impacts of changing climatic and sea level conditions on the Chesapeake Bay ecosystem, including the effectiveness of restoration and protection policies, programs, and projects.
    - **Adaptation Outcome**: Continually pursue, design, and construct restoration and protection projects to enhance the resiliency of Bay and aquatic ecosystems from the impacts of coastal erosion, coastal flooding, more intense and more frequent storms, and sea level rise.

Indicator Development Process

Step	Timeframe
Establish framework (categories, definitions, criteria)	May 2017
Compile lists of potential indicators and data sources	May-June 2017
Evaluate candidate indicators against the criteria	June-July 2017
Gather feedback and prioritize candidate indicators	August-October 2017
Develop implementation plan	Dec. 2017-January 2018
Develop the top three to six indicators	March-April 2018
Compile final results	May-July 2018

Proposed Framework for This Project, Part 1

- Standard process for developing indicators

- Agreed-upon definition of “indicator”:
  - Numerical value derived from actual measurements
  - Trends over time represent or draw attention to underlying trends in the condition of the environment or measure progress towards a desirable state or condition

Proposed Framework for This Project, Part 2

Look for three types of indicators:

Physical climate trends

Ecological and societal impact

Programmatic progress towards resilience

Proposed Framework for This Project, Part 3

“Must-have” criteria:

- Relevant topic
- Cover the Chesapeake region
- Multiple years of data
- Actual observations
- Credible methods
- Data quality and integrity
- Objective
- Uncertainty must be known
- Transparent and reproducible
- Feasible to develop
- Peer-reviewed data*

“Nice-to-have” criteria:

- Fit with other indicators
- Many measurement sites
- Downscaled data
- Long-term records (30+ years)
- At least annual frequency
- Consistent methods
- Low uncertainty
- No major limitations
- Understandable by non-scientists

Our Current Stage: Making Lists

- Master list of topics of interest
  - A “living document”
  - To be used as a guide
- List of existing indicators or proto-indicators
- List of data sources to consider
  - Particularly *monitoring networks* – i.e., ongoing programs that can support indicators that continue to be tracked over time

Request for Help from the STAR Workgroup

We'd love to get your input on…

1. **Initial topic list**
   - What else should be in our scope?
   - In particular, what are good ways to assess "resilience"?
2. **Monitoring networks**
   - Additions to the list (new rows)
   - Rows to remove or merge (e.g., overlapping programs)
   - Spatial, temporal, and parameter details we haven't captured yet
   - Notable strengths and weaknesses of each network
3. **Indicators and proto-indicators**
   - More places where we should look for existing indicators

Process and Timeframe for Input

- Provide comments or additions in the Excel files
- Submit comments to Zoe Johnson
- Provide input by June 7

Indicator Development Process

Step	Timeframe
Establish framework (categories, definitions, criteria)	May 2017
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Comments or Questions?


Thank you!
ERG