AQRP Monthly Technical Report

PROJECT TITLE	Improve Cloud Modeled by WRF using COSP and Generative Adversarial Network	PROJECT #	20-026
PROJECT PARTICIPANTS	PI: Zheng Lu	DATE SUBMITTED	Feb. 10, 2021
REPORTING PERIOD	**From:** Jan. 09, 2021 **To:** Feb. 08, 2021	REPORT #	6

A Financial Status Report (FSR) and Invoice will be submitted separately from each of the Project Participants reflecting charges for this Reporting Period. I understand that the FSR and Invoice are due to the AQRP by the 15th of the month following the reporting period shown above.

Detailed Accomplishments by Task for reporting period

The major effort of the team during this period is to develop a framework of scripts that automatically converts daily WRF outputs of 27 cases into COSP inputs, runs COSP package, and archives the COSP outputs; therefore, the team can greatly shorten the processing time for both Task 2 and Task 3. The team has successfully finished processing all 27 cases. Currently the COSP outputs are evaluated against MODIS observations using the statistical metrics. The model evaluation and long-period (parallel) simulation will be finished by the end of Feb.

In this reporting period, we also spent much effort in testing the assumptions in cloud properties calculation that are needed as the COSP inputs, especially for the Thompson and WSM6 schemes. This is because these two schemes do not output number concentration of cloud ice particles. The ways of effective radius of cloud droplet and ice are also different in three schemes. We are also testing different assumption about calculations of cloud emissivity, cloud hydrometeor production rate, etc.

Preliminary Analysis
We are calculating the statistical metrics of simulated and MODIS cloud properties. This is a still on-going work.

Data Collected
COSP outputs of all 27 cases.

Identify Any Problems or Issues Encountered and Proposed Solutions or Adjustments

N.A.

Goals and Anticipated Issues for the Succeeding Reporting Period

We plan to finish long-term WRF simulation in the next reporting period.

Detailed Analysis of the Progress of the Task Order to Date

90% of Task 1& 2. 15% of Task 3

Do you have any publications related to this project currently under development? If so, please provide a working title, and the journals you plan to submit to.

☐Yes   ☒ No

Do you have any publications related to this project currently under review by a journal? If so, what is the working title and the journal name? Have you sent a copy of the article to your AQRP Project Manager and your TCEQ Liaison?

☐ Yes   ☒ No

Do you have any bibliographic publications (ie: publications that cite the project) related to this project that have been published? If so, please list the reference information. List all items for the lifetime of the project.

☐ Yes   ☒ No

Do you have any presentations related to this project currently under development? If so, please provide working title, and the conference you plan to present it (this does not include presentations for the AQRP Workshop).

☐ Yes   ☒ No

Do you have any presentations related to this project that have been published? If so, please list reference information. List all items for the lifetime of the project.

☐ Yes   ☒ No

Have any personnel changes occurred that were not listed in the original proposal? If so, please include a detailed description of the personnel change(s) below.

☐ Yes   ☒ No

Are any delays expected in the progress of the research? If so, please include a detailed description of the potential delay below.

☐ Yes   ☒ No

Describe any possible concerns/issues (technical or non-technical) that AQRP should be made aware of.

Are you anticipating using all the available funds allocated to this project by the end date? If not, why and approximately what is the amount to be returned?

☒ **Yes**   ☐ **No**

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Submitted to AQRP by
[Zheng Lu]