

## Pre-test (answer order will be randomized)

- (select dropdown) GLM has a native resolution of \_\_\_\_\_ (1km, 2km, 4km, **8km**, 16km) and then the data are re-gridded to match GOES-R series ABI grid resolution of \_\_\_\_\_ (1km, **2km**, 4km, 8km, 16km).
- (T/F) Which of the following statements about the gridded Flash Extent Density (FED) product is false?
  - Common FED averaging times include 1 minute and 5 minutes
  - FED has units of flashes per minute (or per  $n$  minutes)
  - Actual lightning channel locations within stratiform regions are commonly noticeable on FED imagery**
  - FED displays information about the quantity and areal extent of lightning events
- (select all) In addition to Flash Extent Density, which of the following GLM gridded products have potential applicability for operations in national meteorological and hydrological services? Choose all that apply.
  - Event average energy
  - Average flash area**
  - Total optical energy**
  - Density of parallax
- GLM measurements over Canada, the US and northern Mexico are subject to parallax errors that show lightning occurring further \_\_\_\_\_ (**north**, south) than what is recorded by ground-based lightning detection methods.
- (select all) Which of the following is true regarding 'lightning jumps' and their presence on flash extent density or similar flash or event rate products?
  - Lightning jumps typically manifest as a rapid increase in lightning flash and/or event rate over a period of approximately 10 to 20 minutes**
  - Lightning jumps nearly always occur with lines of thunderstorms and mesoscale convective complexes, but not usually with supercell thunderstorms
  - Lightning jumps often precede severe weather impacts, including large hail, damaging straight line winds, and tornadoes**
  - Specific flash or event rate thresholds must be met for forecasters to diagnose a lightning jump and use its presence in their forecast process
- (select all) GLM Flash Extent Density adds value to the forecast process via which of the following? Select all that apply.
  - Allowing forecasters to analyze and diagnose height of in-cloud and cloud-to-cloud flashes to assess their threat to current flights
  - Increasing forecasters' confidence that thunderstorms will increase or maintain their strength**
  - Increasing lightning statement and advisory lead time for decision support services**
  - Increasing forecasters' view of energy contained within cloud-to-ground strikes to allow severe thunderstorm warning issuance
- (T/F) GLM captures over 70% of lightning activity at night

8. Forecasters have observed positive GLM Flash Extent Density values preceding a cloud-to-ground strike at distances up to \_\_\_\_\_ kilometers away from convective cores.
  - a. 25
  - b. 50
  - c. 75
  - d. **100**

## Post-test (answer order will be randomized)

1. (select dropdown) GLM has a native resolution of \_\_\_\_\_ (1km, 2km, 4km, **8km**, 16km) and then the data are re-gridded to match GOES-R series ABI grid of \_\_\_\_\_ (1km, **2km**, 4km, 8km, 16km).
2. (T/F) Which of the following statements about the gridded Flash Extent Density (FED) product is true?
  - a. Common FED averaging times are 20 seconds and 1 minute
  - b. **FED has units of flashes per minute (or per *n* minutes)**
  - c. The FED color map shows small flashes in yellow and green and large ones in blue or indigo to highlight newly developing or rapidly intensifying convection
  - d. FED displays information about lightning channel locations within stratiform regions
3. (select all) In addition to Flash Extent Density, which of the following GLM gridded products have potential applicability for operations in national meteorological and hydrological services? Choose all that apply.
  - a. Areal brightness temperature
  - b. **Average flash area**
  - c. Parallax frequency
  - d. **Total optical energy**
4. GLM measurements over South America are subject to parallax errors that show lightning occurring further \_\_\_\_\_ (north, **south**) than what is recorded by ground-based lightning detection methods.
5. (select all) Which of the following is **false** regarding 'lightning jumps' and their presence on flash extent density or similar flash or event rate products?
  - a. Lightning jumps typically manifest as a rapid increase in lightning flash and/or event rate over a period of approximately 10 to 20 minutes
  - b. **Lightning jumps nearly always occur with lines of thunderstorms and mesoscale convective complexes, but not usually with supercell thunderstorms**
  - c. Lightning jumps often precede severe weather impacts, including large hail, damaging straight line winds, and tornadoes
  - d. **Specific flash or event rate thresholds must be met for forecasters to diagnose a lightning jump and use its presence in their forecast process**
6. (select all) GLM Flash Extent Density adds value to the forecast process via which of the following?

- a. **Allowing forecasters to analyze and diagnose lightning jumps, which can precede severe weather impacts**
  - b. Increasing forecasters' view of energy contained within cloud-to-ground strikes to allow severe thunderstorm warning issuance
  - c. **Increasing lightning statement and advisory lead times for decision support services, such as aviation services**
  - d. Allowing forecasters to distinguish between negative polarity strikes and the more dangerous positive polarity strikes for enhanced warning information
7. (T/F) GLM captures over 90% of lightning activity at night
8. Forecasters have observed positive GLM Flash Extent Density values preceding an associated cloud-to-ground strike at distances up to \_\_\_\_\_ kilometers away from convective cores.
- a. 25
  - b. 50
  - c. 75
  - d. **100**