# **Composite Parameters**

- **1. Composite Indices**
- 1.1 Untitled Slide



## **1.2 Operational Severe Weather Diagnostic Parameters:**

## **Composite Indices**



Notes:

## 1.3 Operational Severe Weather Diagnostic Parameters: Composite

#### Indices



1.4 Operational Severe Weather Diagnostic Parameters



## **1.5 Composite Indices**

	Composite Indices
Su	upercell Composite
	Right-moving (SCP)
<b>.</b>	Left-moving (LSCP)
SIC No	gnificant Tornado Parameter (STP)
	anificant Hail Parameter (KUIP)
<u>) (</u>	unge Hail Parameter (LHP)
	arecho Composite Parameter (DCP)
Cr	aven/Brooks Significant Severe Parameter (SigSvr)
Bu	Ik Richardson Number (BRN)
M	CS Maintenance Probability (MMP)
En	nergy Helicity Index (EHI)
Vc	orticity Generation Paramter (VGP)
W	ind Damage Parameter (WNDG)
Mi	icroburst Composite
En	hanced Stretching Potential (ESP)
Th	<u>ieta-E Index (TEI)</u>
Cri	itical Angle
M	odified SHERBE

## 1.6 Right-Moving Supercell Composite (SCP)



## 1.7 Right-Moving Supercell Composite (SCP) Strengths / Limitations



## 1.8 Left-Moving Supercell Composite (LSCP)



## 1.9 Significant Tornado Parameter (STP)



## 1.10 Significant Tornado Parameter (STP)

## Strengths



## 1.11 Significant Tornado Parameter (STP)

## Limitations



## 1.12 Significant Hail Parameter (SHIP)



## 1.13 Large Hail Parameter (LHP)



## 1.14 Large Hail Parameter Page 2 (LHP)



## 1.15 Large Hail Parameter (LHP) Strengths



## 1.16 Large Hail Parameter (LHP)

## Limitations

Emitations		Large Hail Parameter (LHP) Limitations
Large Hail Parameter (LHP) • Only valid if convection occurs LHP Page 2 • Does not take into account duration of supercell mode or negative impacts on maximum hail size caused by anvil seeding from upstream convection. Limitations Table of Contents	Large Hail Parameter (LHP) LHP Page 2 Strengths Limitations Table of Contents	<ul> <li>Does not differentiate between severe and non-severe hail</li> <li>Only valid if convection occurs</li> <li>Does not take into account duration of supercell mode or negative impacts on maximum hail size caused by anvil seeding from upstream convection.</li> </ul>

## 1.17 Derecho Composite Parameter (DCP)



1.18 Derecho Composite Parameter (DCP) Page 2



## 1.19 Craven-Brooks Significant Severe Parameter (SigSvr)



## 1.20 Bulk Richardson Number (BRN)



## 1.21 Bulk Richardson Number (BRN) Strengths



1.22 Bulk Richardson Number (BRN) Limitations



## 1.23 MCS Maintenance Probability (MMP)



## 1.24 Energy Helicity Index (EHI)



## 1.25 Energy Helicity Index (EHI) Strengths



## 1.26 Energy Helicity Index (EHI) Limitations



## 1.27 Vorticity Generation Parameter (VGP)



## 1.28 Vorticity Generation Parameter (VGP)

## Strengths



## 1.29 Vorticity Generation Parameter (VGP)

### Limitations



## 1.30 Microburst Composite



#### 1.31 Wind Damage Parameter (WNDG)



## 1.32 Modified SHERBE



## 1.33 Modified SHERBE Page 2



## 1.34 Enhanced Stretching Potential (ESP)



### 1.35 Theta-E Index (TEI)



## 1.36 Critical Angle



## 1.37 Non-Supercell Tornado Parameter (NSTP)



1.38 Non-Supercell Tornado Parameter (NSTP) Strengths



## 1.39 Non-Supercell Tornado Parameter (NSTP)

#### Limitations



## 1.40 Significant Hail Parameter (SHIP)

## Limitations



## 2. Composite

## 2.1 Which of these is NOT a limitation of the Large Hail Parameter (LHP)?

(Multiple Choice, 10 points, 1 attempt permitted)



Correct	Choice
	Does not differentiate between severe and non-severe hail
	It is only valid if convection occurs
	It does not take into account duration of supercell mode or negative impacts on maximum hail size caused by anvil seeding from upstream convection.
x	All of the answers are limitations of the LHP.

#### Feedback when correct:

That's right! You selected the correct response.

#### Feedback when incorrect:

You did not select the correct response.

• It is on		
lt does n	Correct	e impacts
🔍 on maxii	That's right! You selected the correct response.	ection.
All of the		
	Continue	

## **Incorrect (Slide Layer)**

• It is on		
It does n	Incorrect	e impacts
on maxir	You did not select the correct response.	ection.
All of the		
_	Continue	

## 2.2 What value of SHIP indicates that, should a storm develop, significant

## hail is extremely likely?

(Multiple Choice, 10 points, 1 attempt permitted)

What value of SHIP indicates that, should a storm develop, significant hail is extremely likely?
● >4
○ >1
0 1.5-2
2-4

Correct	Choice
х	>4
	>1
	1.5-2
	2-4

#### Feedback when correct:

That's right! You selected the correct response.

#### Feedback when incorrect:

You did not select the correct response.

Correct	
'hat's right!	You selected the correct respor
	Continue

## **Incorrect (Slide Layer)**

Incorre	ect	
You did	not select the correct resp	onse.
	Continue	

2.3 This normalized parameter is meant to highlight areas where steep low-level lapse rates correspond with low-level instability, little convective

## inhibition, weak deep-layer vertical shear, and large cyclonic surface

## vorticity.

(Multiple Choice, 10 points, 1 attempt permitted)

• This normalized parameter is meant to highlight areas where steep low-level lapse rates correspond with low-level instability, little convective inhibition, weak deep-layer vertical shear, and large cyclonic surface vorticity.

- Significant Tornado Parameter
- Enhanced Helicity Index
- Non-Supercell Tornado Paramter
- Critical Angle

Correct	Choice
	Significant Tornado Parameter
	Enhanced Helicity Index
Х	Non-Supercell Tornado Paramter
	Critical Angle

#### Feedback when correct:

That's right! You selected the correct response.

#### Feedback when incorrect:

You did not select the correct response.

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• This normalized parameter is meant to highlight areas where steep low-level lapse rates correspond with low-level instability, little convective inhibition, weak deep-layer vertical shear, and large cyclonic

Significa That's right! You selected the correct response. Enhance
Enhance
Non-Sun
Continue
Critical Angre

## **Incorrect (Slide Layer)**

weak de	ep-layer vertical shear, and large cyclonic
Circulture	Incorrect
	You did not select the correct response.
Enhance	
Non-Sup	Continue
Critical An	gie

# 2.4 Which of these parameters is most useful for a quick look at the

## combination of CAPE and shear?

(Multiple Choice, 10 points, 1 attempt permitted)

# Which of these parameters is most useful for a quick look at the combination of CAPE and shear?

Significant Tornado Parameter

Supercell Composite Parameter

O Derecho Composite Parameter

Large Hail Parameter

Correct	Choice
	Significant Tornado Parameter
х	Supercell Composite Parameter
	Derecho Composite Parameter
	Large Hail Parameter

#### Feedback when correct:

That's right! You selected the correct response.

#### Feedback when incorrect:

You did not select the correct response.

Significant	Tornado Parameter
Supercell	Composite Parameter
Derecho	Correct
🔵 Large Ha	That's right! You selected the correct response.
	Continue

## **Incorrect (Slide Layer)**

<ul> <li>Supercell Composite Parameter</li> <li>Derecho</li> <li>Large Ha</li> <li>Continue</li> </ul>	Which of t at the comb	hese parameters is most useful for a quick look ination of CAPE and shear?
Supercent functions Parameter     Derecho     Large Ha     Continue		
Continue	Derecho	Incorrect
Continue	Large Ha	You did not select the correct response.
		Continue

## 2.5 A majority of significant tornadoes have been associated with

# Significant Tornado Parameter values greater than \_\_\_\_\_

(Multiple Choice, 10 points, 1 attempt permitted)

A majority of significant tornadoes have been associated with Significant Tornado Parameter values greater than \_\_\_\_

0 (

0.5

01

5 🔘

Correct	Choice
	0
	0.5
Х	1
	5

#### Feedback when correct:

That's right! You selected the correct response.

#### Feedback when incorrect:

You did not select the correct response.



## **Incorrect (Slide Layer)**

0	
0.5	Incorrect
1	You did not select the correct response.
5	
	Continue

# 2.6 The Derecho Composite Parameter (DCP) was developed to identify environments considered favorable for cold pool "driven" wind events through which four primary mechanisms?

(Multiple Choice, 10 points, 1 attempt permitted)

The Derecho Composite Parameter (DCP) was developed to identify environments considered favorable for cold pool "driven" wind events through which four primary mechanisms?

- OCAPE, SBCAPE, 0-6km shear, 0-6km mean wind
- DCAPE, MUCAPE, 0-6km shear, 0-6km mean wind
- OCAPE, MLCAPE, 0-6km shear, 0-6km mean wind
- OCAPE, NCAPE, 0-6km shear, 0-6km mean wind

Correct	Choice
	DCAPE, SBCAPE, 0-6km shear, 0-6km mean wind
х	DCAPE, MUCAPE, 0-6km shear, 0-6km mean wind
	DCAPE, MLCAPE, 0-6km shear, 0-6km mean wind
	DCAPE, NCAPE, 0-6km shear, 0-6km mean wind

#### Feedback when correct:

That's right! You selected the correct response.

#### Feedback when incorrect:

You did not select the correct response.

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The Derecho Composite Parameter (DCP) was developed to identify environments considered favorable for cold pool "driven" wind events through which four primary mechanisms?

O DCAPE, S	Correct
DCAPE, I	That's right! You selected the correct response.
O DCAPE, I	
O DCAPE, I	Continue

## **Incorrect (Slide Layer)**

DCAPE, S	Incorrect
🔵 DCAPE, I	You did not select the correct response.
DCAPE, I	
🔵 DCAPE, I	Continue

## 2.7 The \_\_\_\_\_\_ is a composite index designed to assess the rotational

## intensity potential of supercells.

(Multiple Choice, 10 points, 1 attempt permitted)

The is a composite index designed to assess the rotational intensity potential of supercells.
Significant Tornado Parameter
Vorticity Generation Parameter
Enhanced Stretching Potential
Energy Helicity Index

Correct	Choice
	Significant Tornado Parameter
	Vorticity Generation Parameter
	Enhanced Stretching Potential
х	Energy Helicity Index

#### Feedback when correct:

That's right! You selected the correct response.

#### Feedback when incorrect:

You did not select the correct response.

The \_\_\_\_\_\_ is a composite index designed to assess the rotational intensity potential of supercells.

) Vorticity	Correct
Energy F	That's right! You selected the correct response.
	Continue

## **Incorrect (Slide Layer)**

Vorticity	Incorrect
) Enhance	
Energy F	You did not select the correct response.
_	
	Continue

## 2.8 What type of environment is the Modified SHERBE composite

## parameter designed to highlight?

(Multiple Choice, 10 points, 1 attempt permitted)

What type of environment is the Modified SHERBE
composite parameter designed to highlight?

O Supercell tornadoes

O High CAPE, low shear

Iow CAPE, high shear

microburst

Correct	Choice
	Supercell tornadoes
	High CAPE, low shear
Х	low CAPE, high shear
	microburst

#### Feedback when correct:

That's right! You selected the correct response.

#### Feedback when incorrect:

You did not select the correct response.

## **Incorrect (Slide Layer)**

High CAPF I
Incorrect You did not select the correct response.
You did not select the correct response.
microbu
Continue

# 2.9 What critical angle values infer streamwise vorticity near the ground, favoring stronger cyclonic rotation closer to the ground in a right-moving supercell?

(Multiple Choice, 10 points, 1 attempt permitted)

What critical angle values infer streamwise vorticity near the ground, favoring stronger cyclonic rotation closer to the ground in a right-moving supercell?

- 110 degrees
- 120 degrees

45 degrees

90 degrees

Correct	Choice
	110 degrees
	120 degrees
	45 degrees
Х	90 degrees

#### Feedback when correct:

That's right! You selected the correct response.

#### Feedback when incorrect:

You did not select the correct response.

What critical angle values infer streamwise vorticity near the ground, favoring stronger cyclonic rotation closer to the ground in a right-moving supercell?

110 degree	Correct
120 degr	correct
🔵 45 degre	That's right! You selected the correct response.
90 degre	
	Continue

## Incorrect (Slide Layer)

What critical angle values infer streamwise vorticity near the ground, favoring stronger cyclonic rotation closer to the ground in a right-moving supercell? 110 degrees 120 degr 45 degre 90 degre

Continue

## 2.10 What value of the microburst composite means that there is a slight

## chance for a microburst given that a storm develops?

(Multiple Choice, 10 points, 1 attempt permitted)

What value of the microburst composite means that there is a slight chance for a microburst given that a storm develops?
○ 1
3
6
0 10

Correct	Choice
	1
х	3
	6
	10

#### Feedback when correct:

That's right! You selected the correct response.

#### Feedback when incorrect:

You did not select the correct response.



## **Incorrect (Slide Layer)**

) 1	
3	Incorrect
) 6	You did not select the correct response.
) 10	
	Continue

## 2.11 Results Slide

(Results Slide, 0 points, 1 attempt permitted)



#### Results for

2.1 Which of these is NOT a limitation of the Large Hail Parameter (LHP)?

2.2 What value of SHIP indicates that, should a storm develop, significant hail is extremely likely?

2.3 This normalized parameter is meant to highlight areas where steep low-level lapse rates correspond with low-level instability, little convective inhibition, weak deep-layer vertical shear, and large cyclonic surface vorticity.

2.4 Which of these parameters is most useful for a quick look at the combination of CAPE and shear?

2.5 A majority of significant tornadoes have been associated with Significant Tornado Parameter values greater than \_\_\_\_

2.6 The Derecho Composite Parameter (DCP) was developed to identify environments considered favorable for cold pool "driven" wind events through which four primary mechanisms?

2.7 The	is a composite index designed to assess the rotational intensity potential of
supercells.	

2.8 What type of environment is the Modified SHERBE composite parameter designed to highlight?

2.9 What critical angle values infer streamwise vorticity near the ground, favoring stronger cyclonic rotation closer to the ground in a right-moving supercell?

2.10 What value of the microburst composite means that there is a slight chance for a

microburst given that a storm develops?

Result slide properties

Passing

80%

Score

Notes:

## Success (Slide Layer)

Results				
Your Score: Passing Score:	%Results.ScorePercent%% (%Results.ScorePoints% points) %Results.PassPercent%% (%Results.PassPoints% points)			
Result:				
Review Quiz	Retry Quiz			

## Failure (Slide Layer)

Results				
Your Passing	Score: Score:	%Results.ScorePercent%% (%Results.ScorePoints% points) %Results.PassPercent%% (%Results.PassPoints% points)		
Result: Xou did not pass.				
Review Quiz				