NASA SPACE APPS 2026 · BE AN EARTH SYSTEM TREND DETECTIVE!

Bluegram

Instagram for Earth systems: 45 years of NASA data, turned into verifiable significance verdicts.

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THE CHALLENGE, ANSWERED

Four questions, four answers on screen

WHAT

4 NASA POWER variables

Temperature, precipitation, solar radiation, relative humidity

WHERE

3D globe, 13 regions

10 global anchors plus 3 Indian subcontinent regions

HOW MUCH

Theil–Sen slope

Change per decade on every marker and card

SIGNIFICANT?

Mann–Kendall + FDR

A p-value and q-value stamp on every post

github.com/Nkovaturient/Bluegram

WHERE AND WHAT

A live NASA globe you can click

13

Regions

Arctic to Sundarbans Delta

4

Variables

T2M, PRECTOTCORR, ALLSKY_SFC_SW_DWN, RH2M

3

NASA GIBS layers

Blue Marble, MODIS Terra True Color, VIIRS Night Lights

Three.js globe with slope-colored pins. Live NASA EONET events appear near each region.

Demo 4–10s · Three.js + NASA GIBS WMS

HOW MUCH, AND IS IT SIGNIFICANT

Every verdict follows the same pipeline

Step	Method	Output on screen
1 Clean	Fill gaps up to 3 months, deseasonalize monthly series (1981–2025)	Annual chart
2 Magnitude	Theil–Sen estimator (scipy)	Dashed slope per decade
3 Significance	Mann–Kendall (pymannkendall)	p-value
4 Spatial control	Benjamini–Hochberg FDR across regions	q-value
5 Stamp	p < 0.05 significant · 0.05–0.10 borderline · above 0.10 not significant	Badge on every card

More than 20% missing months: the stamp reads “Insufficient data”, never a guess.

Demo 10–18s · click Indo-Gangetic Plain, then Arctic

THE TWIST

Contradiction Detector

Arctic vs Antarctic

Slope per decade: [from /api/trends]

p / q: [from /api/trends]

Western Ghats vs Indo-Gangetic Plain

Slope per decade: [from /api/trends]

p / q: [from /api/trends]

Same driver · Opposite direction

Dual SplitGlobe plus stacked DuelingPosts. Live opposing pairs come from the same stats API.

Demo 18–24s

BLUEGRAM PULSE AND PROVENANCE

A feed you can scroll, a result you can verify

/feed

Instagram-style stream with a synced side globe. Agency tabs: NASA, ESA, JAXA, ISRO, Roscosmos, CNSA.

IPFS

One click pins the TrendPost JSON through Pinata and returns an ipfs:// CID.

JSON-LD

Every post embeds a schema.org/Dataset record for machines and agents.

Partner layers (ISRO, ESA, JAXA, Pixxel) are supplemental. The significance stamp always comes from the NASA POWER series.

Demo 24–30s

VERIFY IT YOURSELF

How scientists and judges reproduce each result

Step	Open	You see
1	/?region=indo-gangetic&variable=temperature	Trend post with p, q, slope
2	/?region=arctic&variable=precipitation	Same pipeline, new region
3	Compare regions toggle	Contradiction Detector
4	/feed	Multi-agency Pulse stream
5	:8000/api/trends?variable=temperature&start_year=1981&end_year=2025	Raw JSON for all 13 regions

Benchmark screenshots: [capture one per step from your running app].

Methods: Hussain & Mahmud 2019 · Benjamini & Hochberg 1995 · Stackhouse et al. 2018