GeoPulse-Column-by-Column Explanation of the API

📄 Column-by-Column Explanation of the API Report

1. lp_no

- **What it is:** A serial number automatically assigned to each record/row.
- **Why it matters:** Helps uniquely identify and reference rows in the report.
- **How to interpret:** Simply an index number; it does not represent any geographic or analytical property.

2. extent_ac

- **What it is:** The size of the land parcel under analysis, measured in **acres**.
- **Why it matters:** Indicates how large the monitored area is. Affects the representativeness of vegetation, water, or built-up measurements.
- **How to interpret:** Larger parcels may contain more land-use variability, while smaller parcels give more localized insights.

3. POINT_ID

- **What it is:** A unique identifier for the land parcel/point.
- **Why it matters:** Allows consistent tracking of the same parcel across multiple reports.
- **How to interpret:** Think of this as a “parcel ID” or “project code.”

4. EASTING-X

- **What it is:** The **Easting (X coordinate)** in a projected

- **What it is:** The **Easting (X coordinate)** in a projected coordinate system (usually UTM).
- **Why it matters:** Provides precise geolocation for the parcel in mapping systems.
- **How to interpret:** Used by GIS software to place the parcel correctly on Earth's surface.

5. NORTHING-Y

- **What it is:** The **Northing (Y coordinate)** in a projected coordinate system.
- **Why it matters:** Complements EASTING-X to pinpoint parcel location.
- **How to interpret:** Together with EASTING, it defines the parcel's exact position.

6. LATITUDE

- **What it is:** Geographic latitude in WGS84 (degrees).
- **Why it matters:** Provides a globally recognized way to locate the parcel.
- **How to interpret:** Positive = Northern Hemisphere; Negative = Southern Hemisphere.

7. LONGITUDE

- **What it is:** Geographic longitude in WGS84 (degrees).
- **Why it matters:** Used with latitude to identify the parcel's location globally.
- **How to interpret:** Positive = Eastern Hemisphere; Negative = Western Hemisphere.

8. Before Period Start

- **What it is:** The start date of the **baseline period** used for comparison.
- **Why it matters:** Defines the "before-change" timeframe.
- **How to interpret:** Data from this period acts as the reference condition.

9. Before Period End

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- **What it is:** End date of the baseline analysis period.
- **Why it matters:** Ensures data consistency by defining a clear time window.
- **How to interpret:** Together with "Start Date," it sets the first observation period.

10. After Period Start

- **What it is:** Start date of the **comparison period**.
- **Why it matters:** Defines the "after-change" timeframe.
- **How to interpret:** Used to detect changes compared to the baseline.

11. After Period End

- **What it is:** End date of the comparison analysis period.
- **Why it matters:** Ensures observations are within the chosen timeframe.
- **How to interpret:** Marks the end of the "after-change" reference window.

12. Vegetation (NDVI) – Before Value

- **What it is:** Average **NDVI (Normalized Difference Vegetation Index)** before the change period.
- **Why it matters:** NDVI measures vegetation greenness and health (range: -1 to +1). Higher = healthier vegetation.
- **How to interpret:**
  - <0.2 → Sparse/poor vegetation.
  - 0.2–0.5 → Moderate vegetation.
    - 0.5 → Dense, healthy vegetation.

13. Vegetation (NDVI) – After Value

- **What it is:** NDVI after the change period.
- **Why it matters:** Shows the updated vegetation health.
- **How to interpret:** Compare with "Before Value" to assess gain/loss in vegetation.

14. Built-up Area (NDBI) – Before Value

14. Built-up Area (NDBI) – Before Value

- **What it is:** Average **NDBI (Normalized Difference Built-up Index)** before the change period.
- **Why it matters:** NDBI highlights urban/built-up features like concrete, rooftops, and roads.
- **How to interpret:** Higher values = more construction/built-up area.

15. Built-up Area (NDBI) – After Value

- **What it is:** NDBI after the change period.
- **Why it matters:** Detects new development or reduction of built-up surfaces.
- **How to interpret:** Increase = growth in construction; Decrease = demolition/opening of land.

16. Water/Moisture (NDWI) – Before Value

- **What it is:** Average **NDWI (Normalized Difference Water Index)** before the change period.
- **Why it matters:** NDWI indicates presence of water bodies or soil moisture.
- **How to interpret:**
  - Higher values = more water/moisture.
  - Negative values = dry land/urban.

17. Water/Moisture (NDWI) – After Value

- **What it is:** NDWI after the change period.
- **Why it matters:** Shows whether water/moisture increased or decreased.
- **How to interpret:** Compare with “Before Value” for changes.

18. Vegetation (NDVI) – Difference

- **What it is:** Change in NDVI (After – Before).
- **Why it matters:** Quantifies vegetation improvement or decline.
- **How to interpret:**
  - Positive → Growth/improvement.
  - Negative → Decline/stress/loss.

19. Vegetation (NDVI) – Interpretation

- **What it is:** Human-readable description of the NDVI difference.
- **Why it matters:** Converts raw numbers into meaningful insights.
- **How to interpret:** Example: “Vegetation growth or improvement.”

20. Vegetation (NDVI) – Significance

- **What it is:** Indicates if the vegetation change is statistically/significantly relevant.
- **Why it matters:** Differentiates between small/noisy changes vs meaningful ones.
- **How to interpret:** “Yes” = significant change; “No” = negligible.

21. Built-up Area (NDBI) – Difference

- **What it is:** Change in NDBI (After – Before).
- **Why it matters:** Quantifies urban development activity.
- **How to interpret:**
  - Positive → Increase in construction.
  - Negative → Decrease/demolition.

22. Built-up Area (NDBI) – Interpretation

- **What it is:** Human-readable explanation of NDBI change.
- **Why it matters:** Makes it clear if construction activity occurred.
- **How to interpret:** Example: “Construction or development increase.”

23. Built-up Area (NDBI) – Significance

- **What it is:** Flags whether the NDBI change is significant.
- **Why it matters:** Avoids over-reporting of minor variations.
- **How to interpret:** “Yes” = meaningful change; “No” = minor/no change.

24. Water/Moisture (NDWI) – Difference

- **What it is:** Change in NDWI (After – Before).
- **Why it matters:** Detects water body expansion, drying, or soil moisture changes.
- **How to interpret:** Positive = water increase; Negative = drying.

25. Water/Moisture (NDWI) – Interpretation

- **What it is:** Human-readable description of NDWI change.
- **Why it matters:** Translates index values into plain meaning.
- **How to interpret:** Example: “No significant water change.”

26. Water/Moisture (NDWI) – Significance

- **What it is:** Flags if water change is significant.
- **Why it matters:** Helps clients focus on meaningful hydrological changes.
- **How to interpret:** “Yes” = real change; “No” = stable.

27. Conversion_status

- **What it is:** Final status of API analysis for that parcel.
- **Why it matters:** Shows whether the data extraction and calculations were successful.
- **How to interpret:** “Successful” = data processed correctly; other statuses may indicate errors or incomplete processing.