





How Open data and Open-source software can help us managing **green** assets for more **climate resilient cities**.

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Who am I and what do I do?



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```
tile_nm = get_tile_nm(tile_str)
# extract y tile coordinates for directory naming
yyy_tile = tile_nm.split('_')[-1]
sep = ''
yy_tile = sep.join(list(yyy_tile)[0:2])
# construct path to tile
tile_dir = os.path.join(bm_idir, yy_tile, tile_nm)
return tile_dir
except:
    print('Something went wrong, tile directory not set.')

def get_tree_nm(istr):
    """
    Extract tree name from provided string

    Parameters
    -----
    istr : str
        String to extract the tree name from.
        Tree name in the following format: 'tree_[0-9]+'

    Returns
    -----
    tree_nm : str
        Extracted tree name.

    """
    try:
        # extract tile name
        tree_nm_patt = re.compile('tree_[0-9]+')
        tree_nm = tree_nm_patt.search(istr).group(0)
        return tree_nm
    except:
        print('Something went wrong, tile name not extracted.')

def unique(ilist, tile_nm=False):
    """
    Select and return only unique values in the input list.

    Parameters
    -----
    ilist : list
        Input list.
    tile_nm : bool, optional
        If True exclude duplicates based on the tile name. The default is False.

    Returns
    -----
    unique_list : list
        List with only unique values.

    """
    try:
```



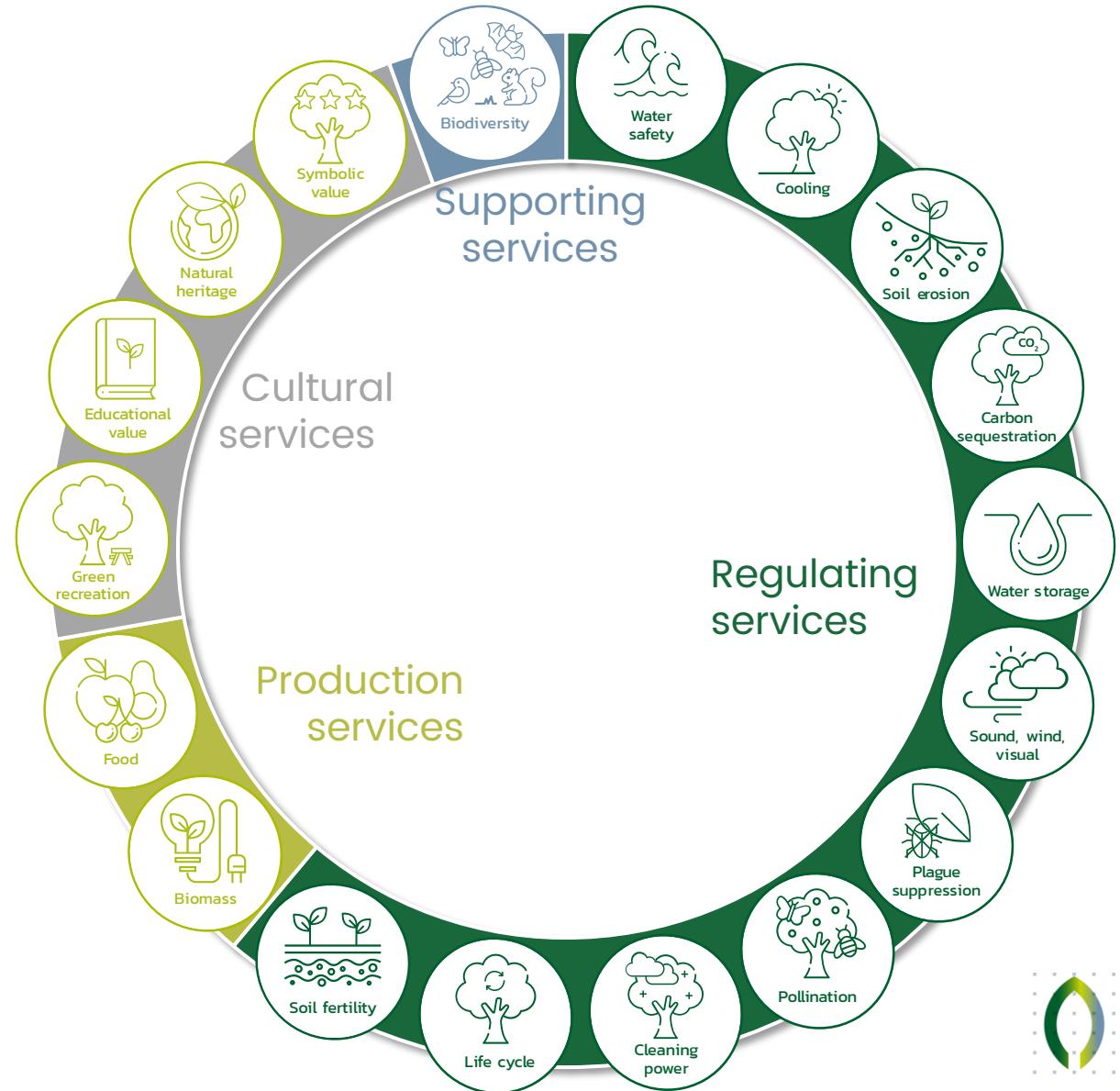
The need for adaptation and mitigation

- Climate change is not only real, but it is hitting us hard.
- We are not able to stop it.
- We can slow it down and prepare ourselves.
- (Urban) Green play a crucial role



The value of green

- Carbon sequestration
- Cooling
- Air quality
- Stormwater
- Biodiversity
- Human well-being





How can we analyse green assets?

Open - Knowledge



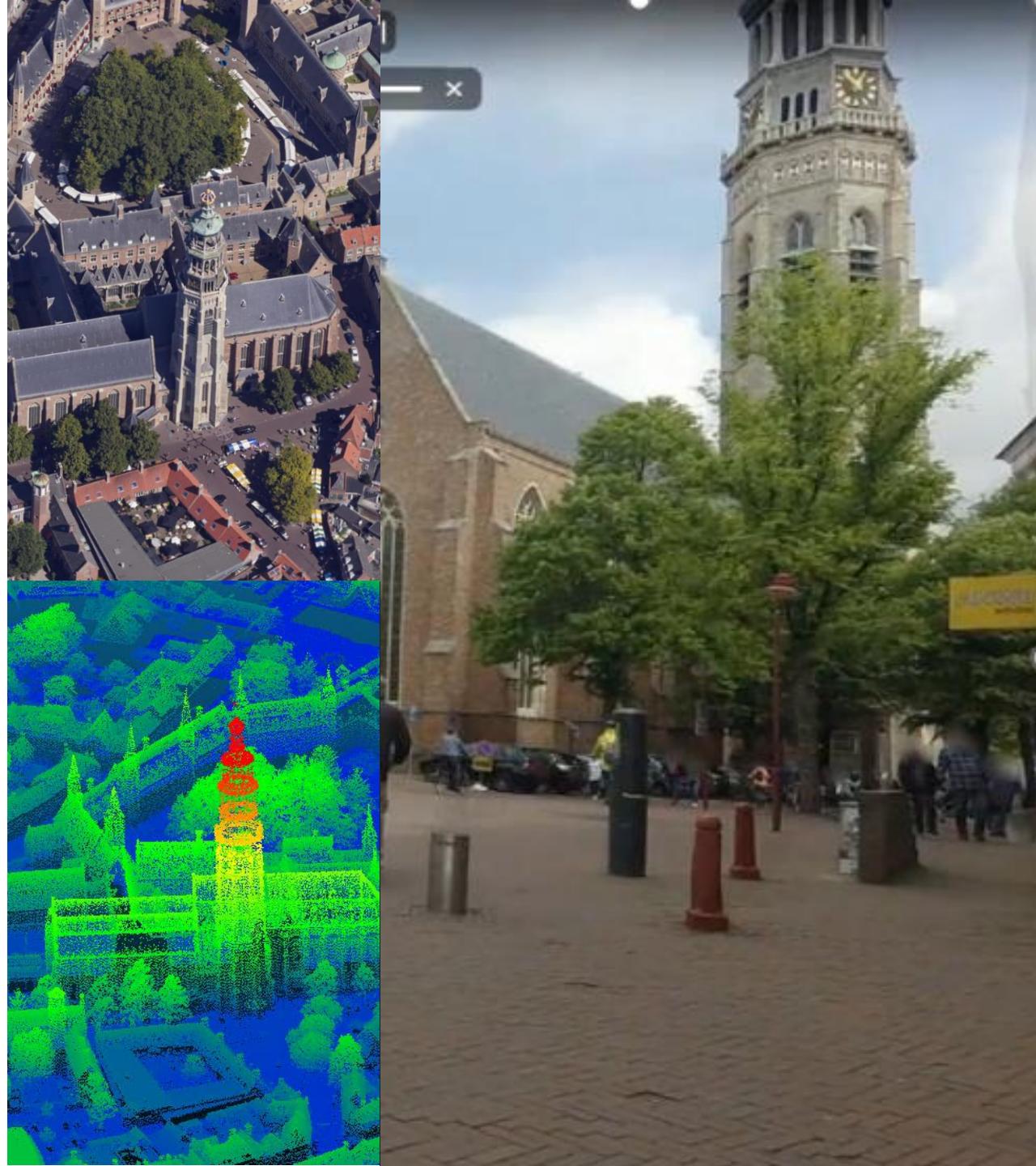
Open - Tools

Open - Data



Open Data

- Aerial images (ortho and stereo)
- Aerial LiDAR
- Satellite images
- Governmental data (BAG, BGT, etc.)
- Other sources (OSM, Mapillary)



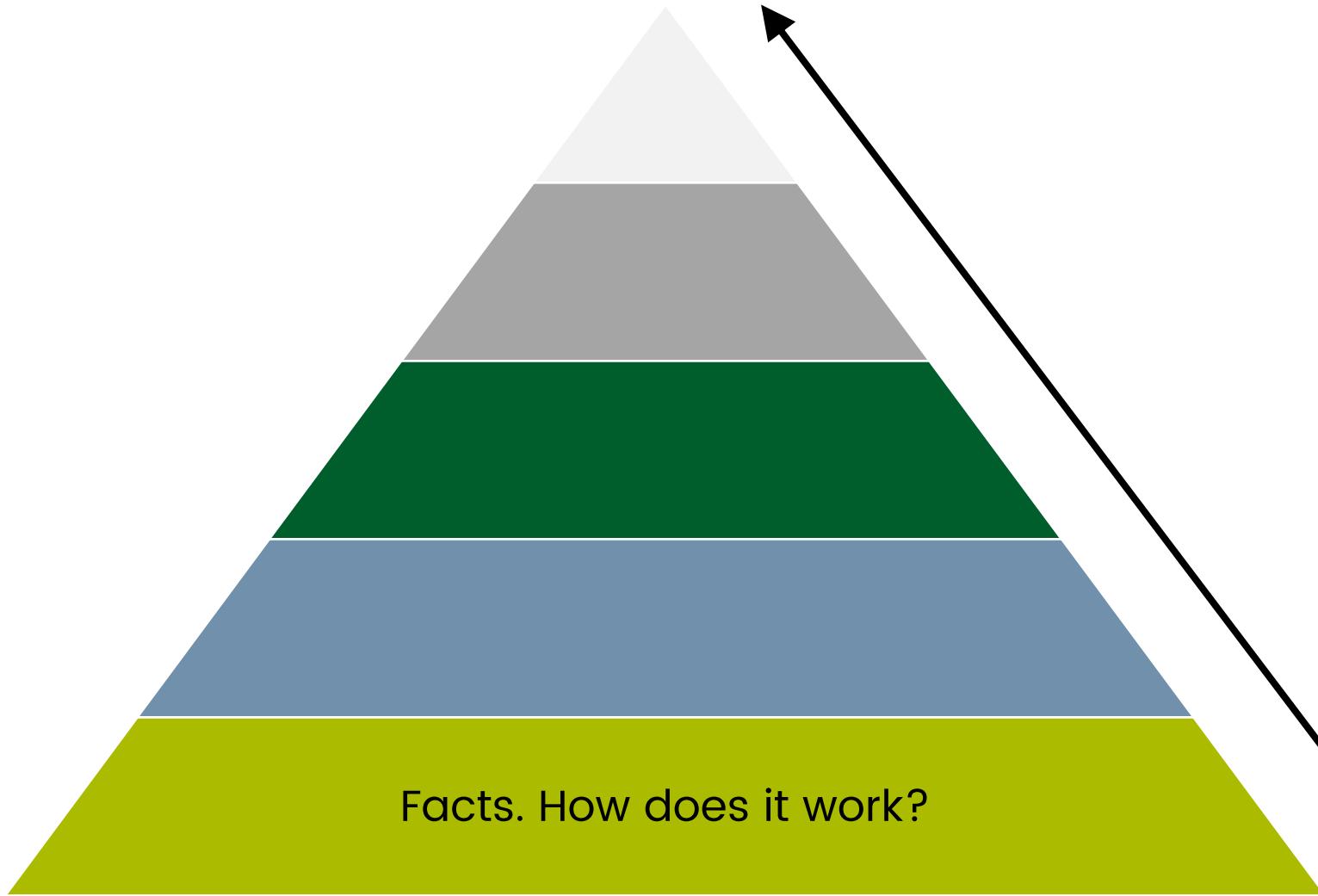


Open-software

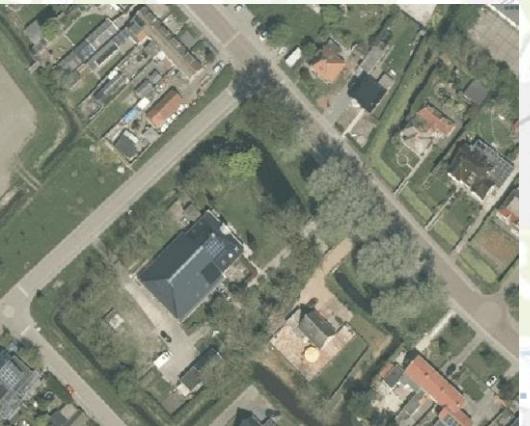
- QGIS
- GDAL
- PDAL
- CloudCompare
- Python
- R



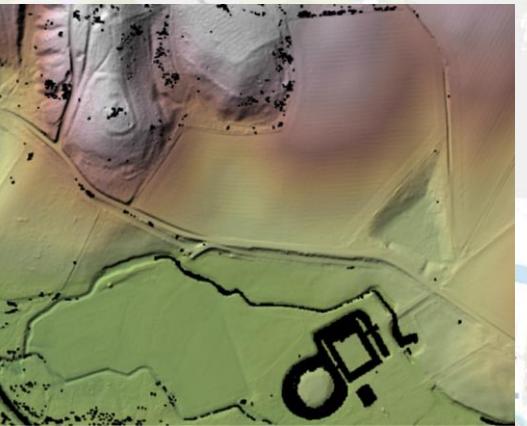
How can we unlock the power of green?



Facts



TrueOrtho aerial images



Height digital models



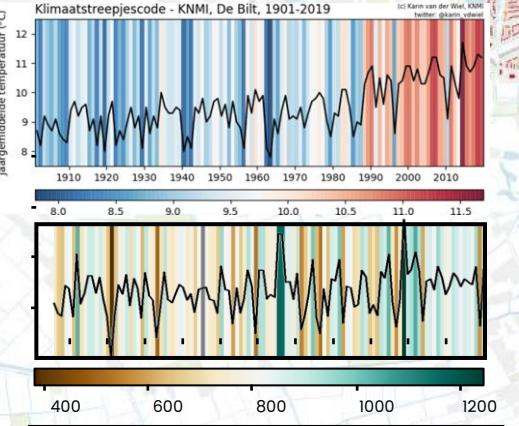
BomenMonitor



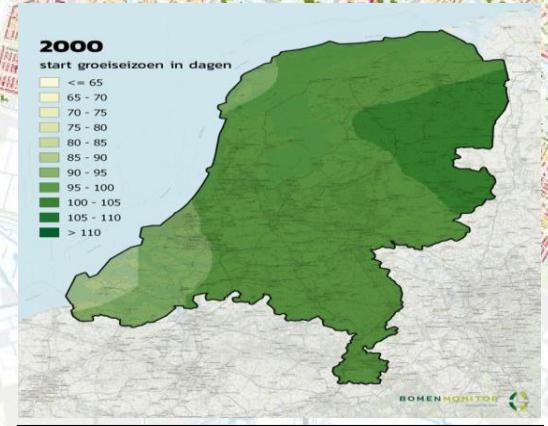
Garden imperviousness map



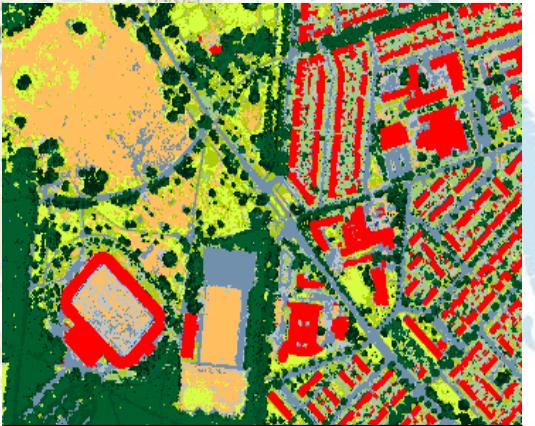
Surface temperature



Precipitation,
temperature and
drought

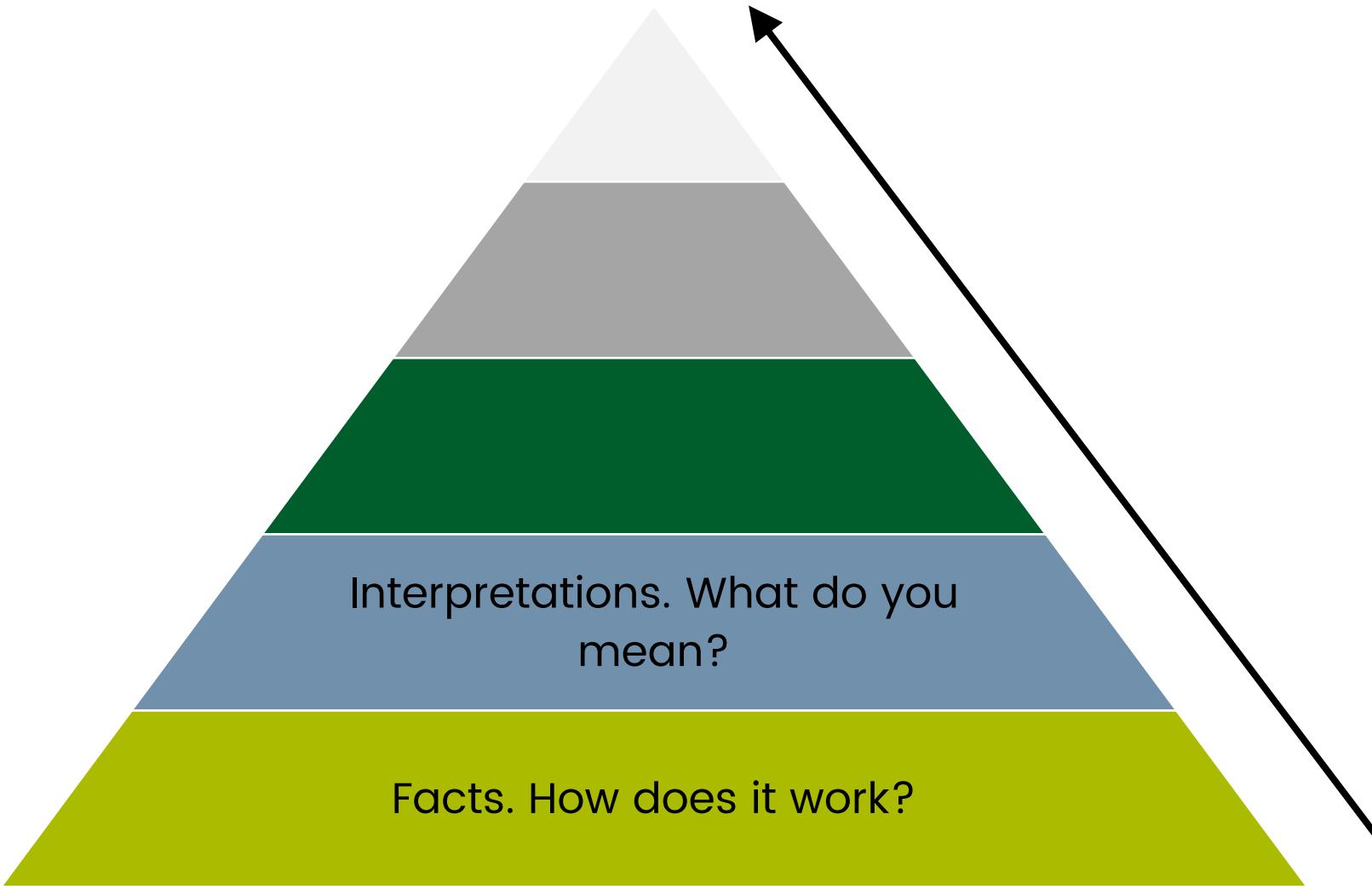


Growing season map

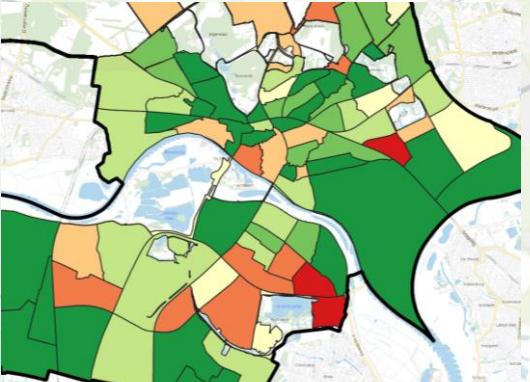


Land cover
classification

How can we unlock the power of green?



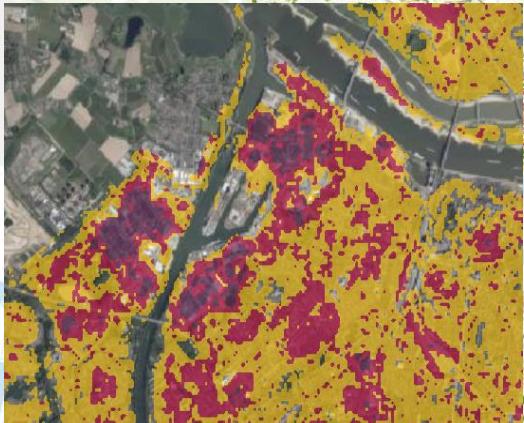
From facts to interpretations



Change in tree cover



Growing space model



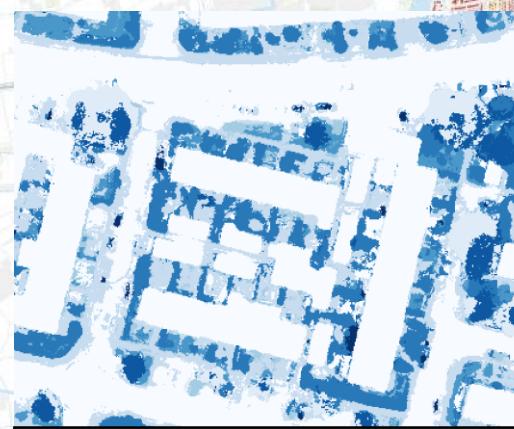
Climate stress areas



I-Tree benefits for all trees



Destoning potential



Water infiltration,
summer & winter

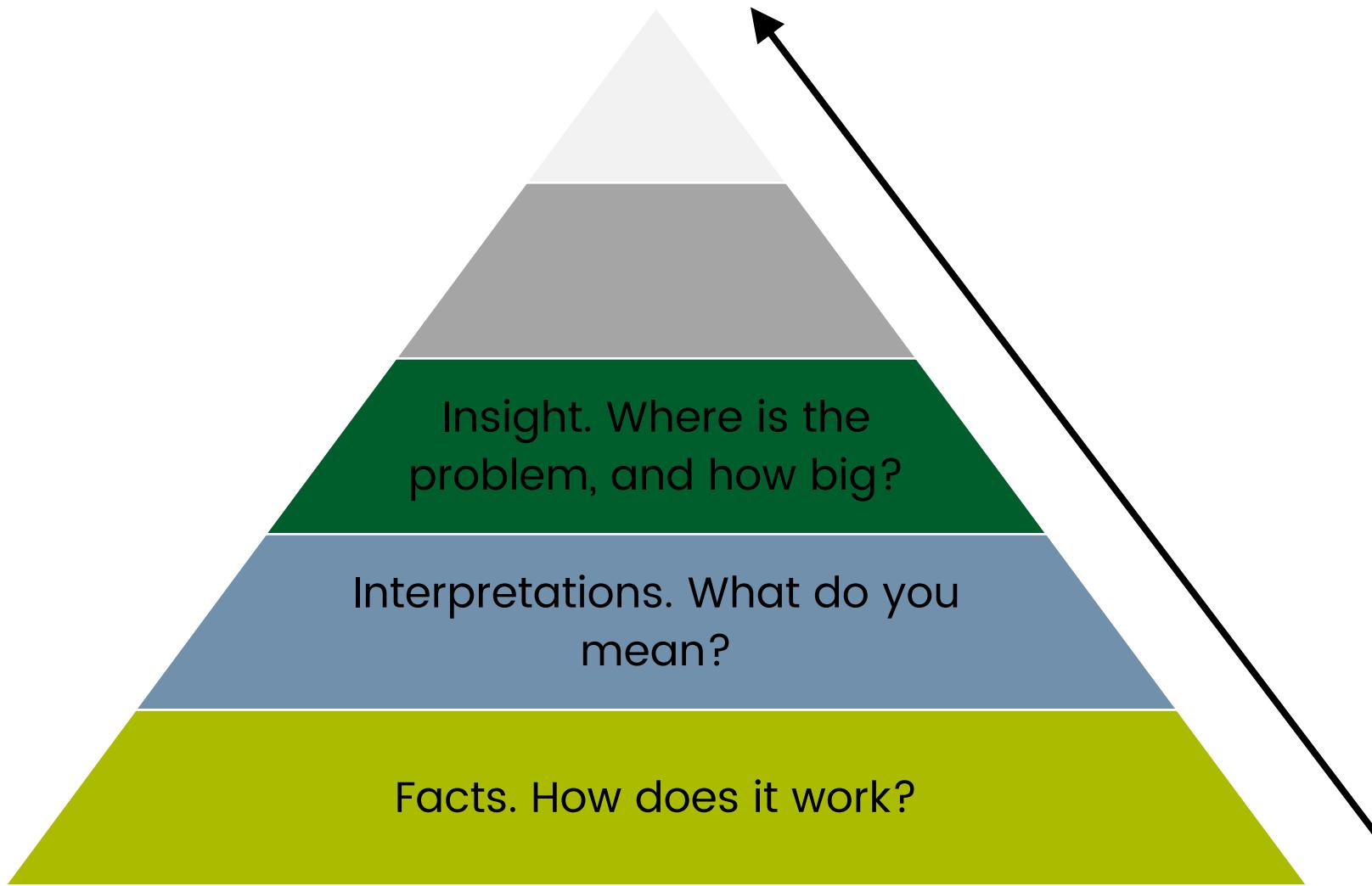


Shadow, gray & green

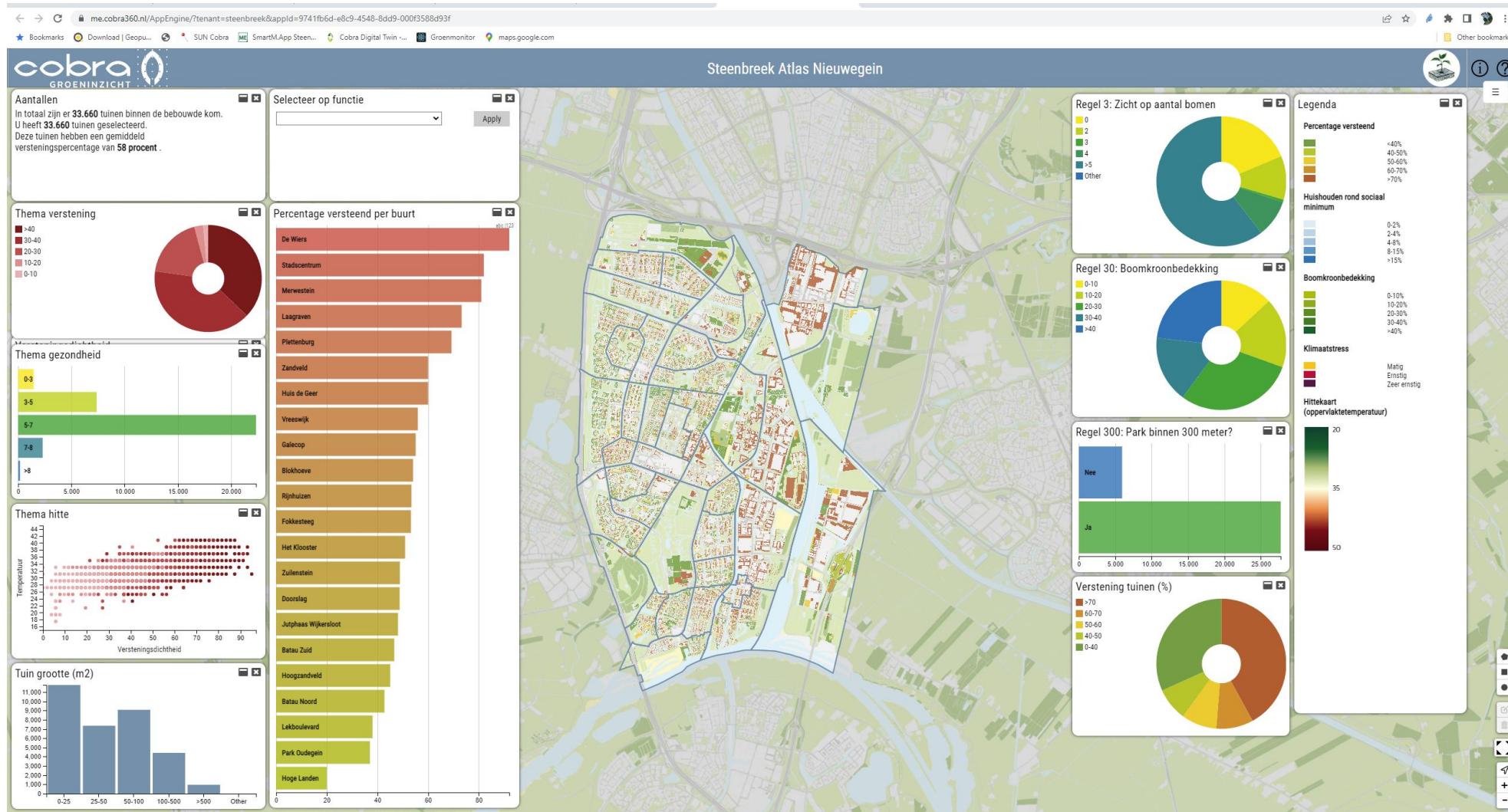


3-30-300-rule

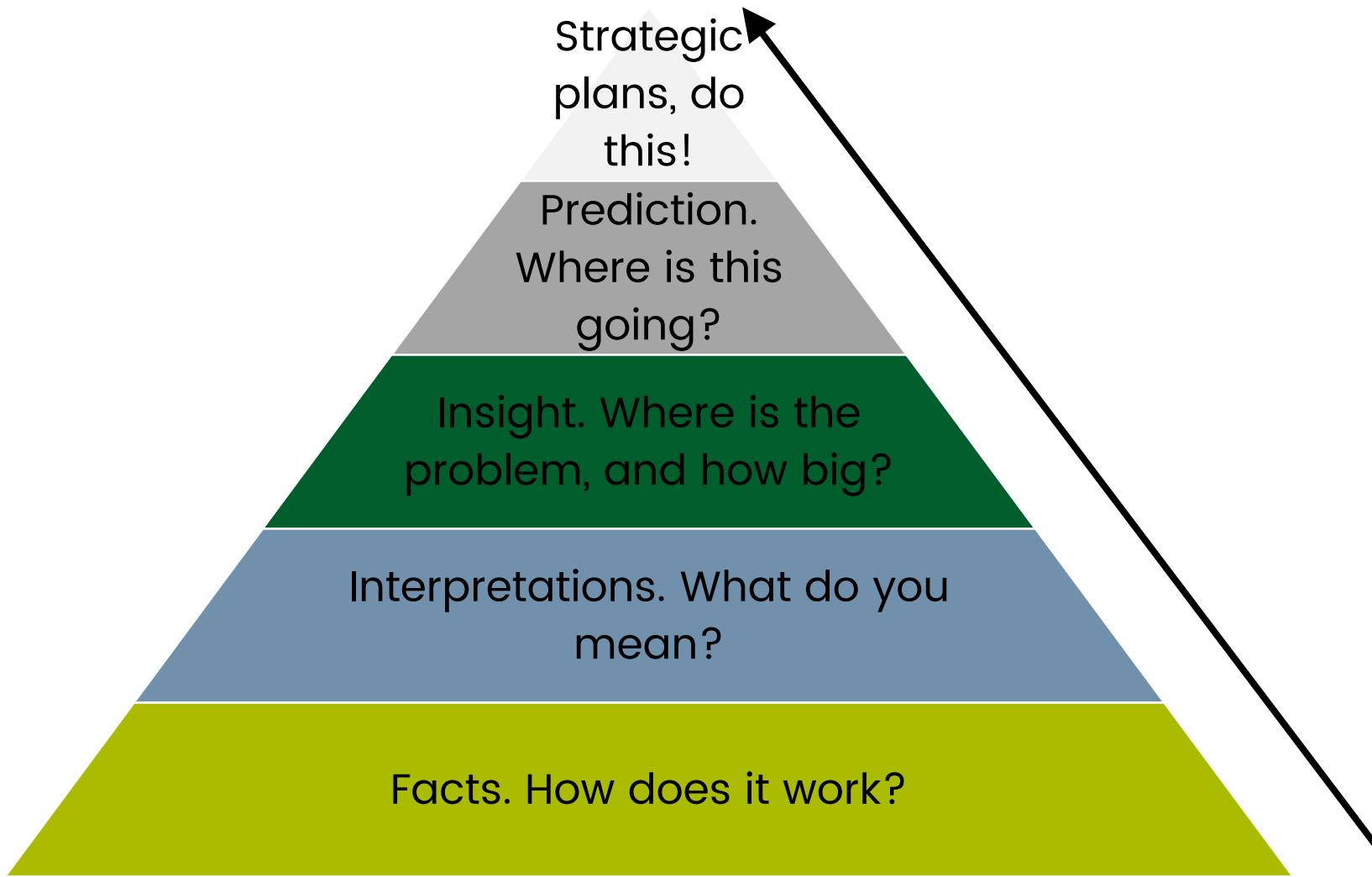
How can we unlock the power of green?



From interpretations to insights

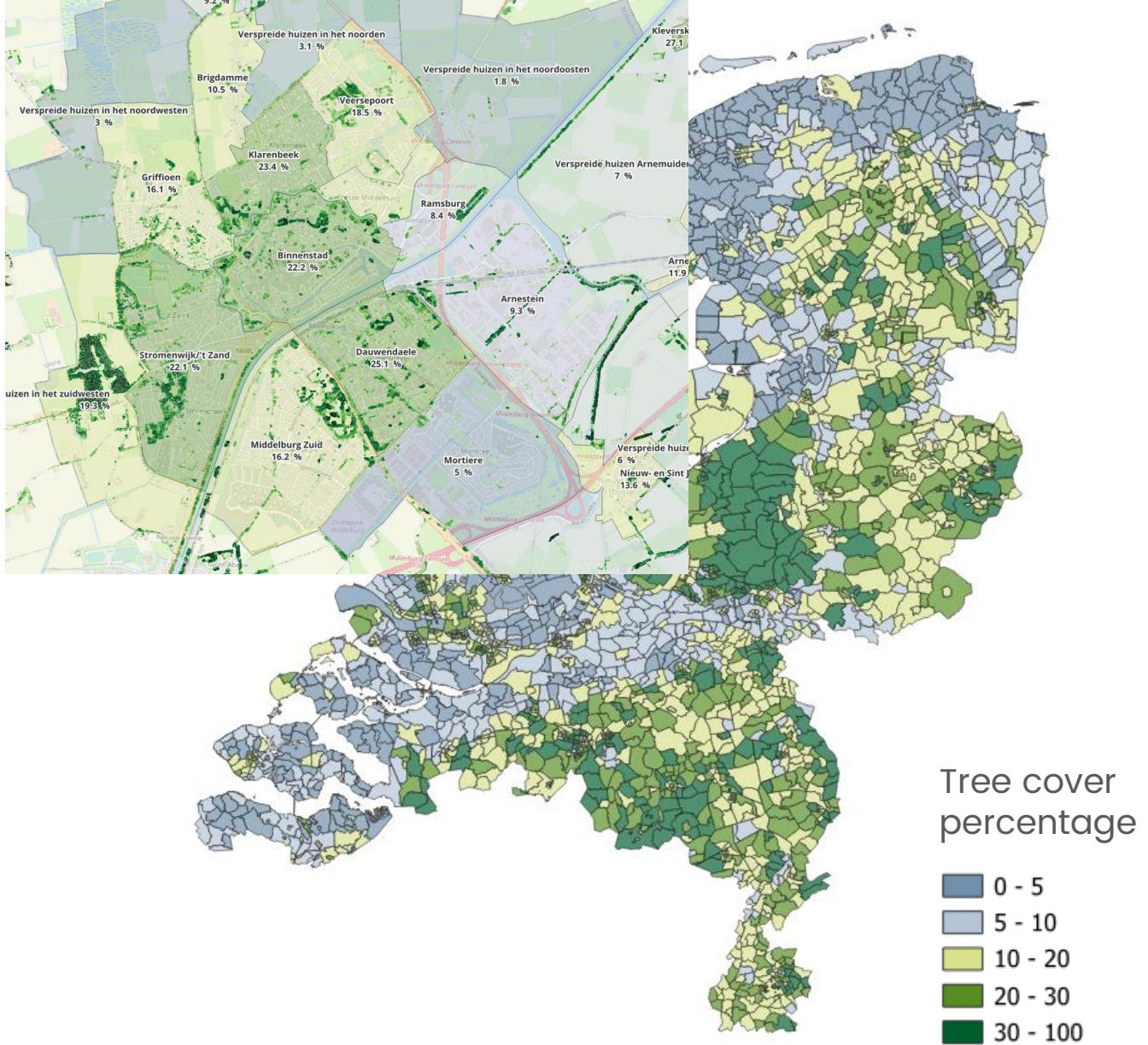


How can we unlock the power of green?



And back to open data

- Education, Research, and Journalism
- Statistics at municipality and district level
- Urban tree cover
- Green – grey percentages
- 3 – 30 -300





Thank you for
your attention !

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