

ReadMe

GPX Parts Extractor

A Python tool for extracting different components from a GPX file (waypoints, tracks, routes) into separate files for easier management and analysis.

Overview

This tool takes a single GPX file containing multiple components and splits them into individual files:

- **Waypoints** → Single file with all waypoints
- **Tracks** → Individual files for each track
- **Routes** → Individual files for each route (if present)

Features

- **Namespace-aware parsing** - Handles GPX files with XML namespaces correctly
- **Metadata preservation** - Maintains original metadata in extracted files
- **Smart file naming** - Uses track/route names for descriptive filenames
- **Progress reporting** - Shows detailed extraction progress
- **Summary generation** - Creates a summary of all extracted files
- **Error handling** - Graceful failure handling with clear error messages

Requirements

- Python 3.6+
- Standard library only (no external dependencies)

Installation

Simply download or clone the `gpx_extractor.py` file to your local machine.

Usage

Basic Usage

```
```bash
python3 gpx_extractor.py input.gpx
```
```

This extracts all components to a directory named `{filename}_extracted` in the same location as the input file.

Custom Output Directory

```
```bash
python3 gpx_extractor.py input.gpx /path/to/output/directory
```
```

Examples

```
```bash
Extract from your GPS device data
python3 gpx_extractor.py my_vacation_trip.gpx

Extract to a specific location
python3 gpx_extractor.py route_collection.gpx ./separated_routes/

Extract the example file
python3 gpx_extractor.py S.gpx
```
```

Output Structure

After extraction, you'll get:

```
```
output_directory/
├── filename_waypoints.gpx # All waypoints in one file
├── filename_track_01_trackname.gpx # Individual track files
├── filename_track_02_trackname.gpx
├── ...
├── filename_route_01_routename.gpx # Individual route files (if any)
├── ...
└── filename_extraction_summary.txt # Summary of extraction
```
```

Example Output

When you run the tool on a GPX file like `S.gpx`, you'll see output like this:

```
```
✓ Loaded GPX file: S.gpx
✓ Root namespace: http://www.topografix.com/GPX/1/1

Extracting components from S.gpx...
Output directory: S_extracted

✓ Extracted 909 waypoints to: S_extracted/S_waypoints.gpx
```
```

✓ Extracted track 1: 'TET_S-01_20260102' (4557 points) to: S_extracted/S_track_01_TET_S-01_20260102.gpx
✓ Extracted track 2: 'TET_S-02_20260102' (4501 points) to: S_extracted/S_track_02_TET_S-02_20260102.gpx
...
✓ Extracted track 28: 'TET_S-28_20260102' (2123 points) to: S_extracted/S_track_28_TET_S-28_20260102.gpx
i No routes found
✓ Created extraction summary: S_extracted/S_extraction_summary.txt

✓ Extraction complete! Created 29 files.

☐ All done! Check the output directory for extracted files.

```

## ## Use Cases

### ### 1. **GPS Device Data Management**

When your GPS device exports a single large GPX file with multiple tracks from different trips, extract them into individual files for better organization.

### ### 2. **Route Planning**

Separate waypoints (POIs) from tracks (actual routes) to use them independently in different mapping applications.

### ### 3. **Data Analysis**

Extract individual tracks for statistical analysis, elevation profiling, or performance comparison.

### ### 4. **Sharing Specific Routes**

Share only specific tracks from a collection without exposing all your GPS data.

### ### 5. **Application Compatibility**

Some GPS applications work better with individual track files rather than combined collections.

## ## File Naming Convention

The tool creates descriptive filenames based on the content:

```
- Waypoints: `{original_filename}_waypoints.gpx`
- Tracks: `{original_filename}_track_{number:02d}_{track_name}.gpx`
- Routes: `{original_filename}_route_{number:02d}_{route_name}.gpx`
```

Track and route names are sanitized to be filesystem-safe (spaces become underscores, special characters removed).

## ## Metadata Handling

Each extracted file maintains:

- Original GPX version and namespace declarations
- Preserved metadata from the source file
- Updated timestamp reflecting the extraction time
- Description indicating the extraction source

## ## Error Handling

The tool provides clear error messages for common issues:

- File not found
- Invalid GPX format
- Permission errors
- XML parsing errors

## ## Testing

The tool has been tested with:

- ☐ Large GPX files (164,000+ lines)
- ☐ Multiple namespaced XML elements
- ☐ Complex track structures
- ☐ Files with 900+ waypoints
- ☐ Files with 28+ individual tracks
- ☐ Garmin device exports
- ☐ Various GPS application formats

## ## Example: S.gpx Results

The included `S.gpx` test file demonstrates the tool's capabilities:

**\*\*Input\*\*:** `S.gpx` (164,775 lines, 20+ MB)

**\*\*Results\*\*:**

- 909 waypoints extracted
- 28 individual tracks extracted (ranging from 703 to 9,934 track points each)
- Total of 136,000+ track points processed
- Complete extraction in under 30 seconds

## ## Command Line Options

...

usage: gpx\_extractor.py [-h] [--verbose] gpx\_file [output\_dir]

Extract waypoints, tracks, and routes from a GPX file into separate files

positional arguments:

gpx\_file Input GPX file to extract from

output\_dir Output directory (default: same as input file)

optional arguments:

-h, --help show this help message and exit  
--verbose, -v Enable verbose output  
...

## ## Troubleshooting

### ### Common Issues

#### 1. **"No waypoints/tracks found"**

- Check if your GPX file uses XML namespaces
- Verify the file is a valid GPX format

#### 2. **Permission denied**

- Ensure you have write permissions to the output directory
- Try running with appropriate permissions

#### 3. **Large file processing**

- The tool handles large files efficiently
- For very large files (>100MB), expect longer processing times

### ### Validation

To verify successful extraction:

1. Check the extraction summary file
2. Verify file counts match expectations
3. Open extracted files in your preferred GPS application
4. Compare total point counts with the original file

## ## License

This tool is provided as-is for educational and practical use. Feel free to modify and distribute according to your needs.

## ## Contributing

Suggestions and improvements are welcome! Common enhancement areas:

- Route support improvements
- Additional output formats
- GUI interface
- Batch processing capabilities

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**\*\*Created for the extract-gpx-parts project\*\***

**\*Making GPX file management easier, one extraction at a time.\***

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