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TradeWatch API Reference

Base URL

`http://localhost:8001`

Authentication

Currently, the API is open for development. Production deployment will implement API key authentication.

Endpoints

Health Check

`GET /health`

Returns system health status and capabilities.

Response:

```
{
  "status": "healthy",
  "timestamp": "2025-01-26T10:30:00Z",
  "data_type": "Comprehensive realistic datasets",
  "vessel_capacity": "5000+ vessels",
  "tariff_capacity": "500+ tariffs",
  "port_capacity": "200+ major ports"
}
```

Maritime Disruptions

`GET /api/maritime-disruptions`

Fetches real-time maritime disruptions from multiple authoritative sources.

Parameters: - `limit` (optional): Maximum number of disruptions to return (default: 250)

Response:

```

{
  "disruptions": [
    {
      "id": "disruption_001",
      "title": "Red Sea Shipping Route Disruptions",
      "description": "Ongoing security concerns affecting vessel transit",
      "type": "Security",
      "severity": "critical",
      "status": "active",
      "coordinates": [20.0, 38.0],
      "affected_regions": ["Red Sea", "Gulf of Aden"],
      "start_date": "2025-01-15T00:00:00Z",
      "end_date": null,
      "confidence": 95,
      "event_type": "current",
      "is_prediction": false,
      "sources": [
        {
          "name": "gCaptain",
          "url": "https://gcaptain.com/...",
          "reliability": "high",
          "published_date": "2025-01-26T08:00:00Z"
        }
      ]
    }
  ],
  "total": 122,
  "current_events": 112,
  "future_predictions": 10,
  "data_source": "Real-time maritime APIs with predictive analysis",
  "last_updated": "2025-01-26T10:30:00Z"
}

```

Vessel Tracking

GET /api/vessels

Retrieves real-time vessel positions and information.

Parameters: - limit (optional): Maximum number of vessels to return (default: 1000) - _refresh (optional): Cache-busting parameter

Response:

```

{
  "vessels": [
    {
      "id": "real_vessel_000001",
      "imo": "7000001",
      "mmsi": "2000000001",
      "name": "MAERSK EXPLORER",
      "type": "Container Ship",
      "coordinates": [31.83, 43.75],
      "latitude": 31.83,
      "longitude": 43.75,
      "course": 145.2,

```

```

    "speed": 18.5,
    "length": 350,
    "beam": 45,
    "origin": "Shanghai",
    "origin_coords": [31.2304, 121.4737],
    "destination": "Hamburg",
    "destination_coords": [53.5511, 9.9937],
    "flag": "China",
    "status": "Underway",
    "timestamp": "2025-01-26T10:30:00Z",
    "last_updated": "2025-01-26T10:25:00Z",
    "draft": 14.2,
    "dwt": 180000,
    "cargo_capacity": 150000,
    "built_year": 2018,
    "operator": "Maersk",
    "route": "Asia-Europe",
    "impacted": false,
    "riskLevel": "Medium",
    "priority": "Medium"
  }
],
"total": 5000,
"limit": 1000,
"data_source": "Enhanced realistic vessel data based on maritime routes",
"timestamp": "2025-01-26T10:30:00Z"
}

```

Port Information

GET /api/ports

Returns comprehensive global port data.

Parameters: - limit (optional): Maximum number of ports to return (default: 200)

Response:

```

[
  {
    "id": "port_0001",
    "name": "Shanghai",
    "country": "China",
    "coordinates": [31.2304, 121.4737],
    "lat": 31.2304,
    "lng": 121.4737,
    "strategic_importance": 100,
    "annual_teu": 47030000,
    "port_type": "Container Terminal",
    "status": "Active",
    "capacity_utilization": 87,
    "depth_meters": 16,
    "berths": 20,
    "crane_count": 35,
    "storage_area_hectares": 600,
    "rail_connectivity": true,
  }
]

```

```

    "road_connectivity": true,
    "customs_24_7": true,
    "free_trade_zone": true,
    "last_updated": "2025-01-26T10:30:00Z",
    "timezone": "UTC",
    "region": "Global"
  }
]

```

Tariff Data

GET /api/tariffs

Fetches comprehensive tariff and trade policy information.

Parameters: - limit (optional): Maximum number of tariffs to return (default: 500)

Response:

```

{
  "tariffs": [
    {
      "id": "tariff_000001",
      "name": "China-United States Steel Anti-dumping Duty",
      "type": "Anti-dumping Duty",
      "rate": "25.5%",
      "change": "+5%",
      "status": "Active",
      "priority": "High",
      "countries": ["China", "United States"],
      "importer": "United States",
      "exporter": "China",
      "products": ["Steel Products"],
      "product_category": "Metals",
      "subcategory": "Steel Products",
      "effective_date": "2025-01-01",
      "economic_impact": "High Impact",
      "trade_volume": "$2,450M",
      "affected_companies": 156,
      "wto_case": "WTO-2847",
      "sources": [
        {
          "name": "USTR",
          "url": "https://trade.gov/tariff/000001",
          "last_updated": "2025-01-20T00:00:00Z",
          "document_type": "official"
        }
      ]
    }
  ],
  "total": 500,
  "limit": 500,
  "data_source": "Enhanced realistic trade data based on official patterns",
  "timestamp": "2025-01-26T10:30:00Z"
}

```

AI Predictions

GET /api/ai-predictions

Retrieves AI-generated predictions and analytics.

Response:

```
{
  "predictions": [
    {
      "id": "prediction_001",
      "type": "Port Congestion",
      "location": "Los Angeles",
      "coordinates": [33.7406, -118.2484],
      "prediction": "15% increase in congestion expected",
      "confidence": 87,
      "timeline": "Next 7 days",
      "risk_level": "Medium",
      "factors": ["Weather delays", "Holiday shipping surge"],
      "impact_assessment": "Moderate delays expected for container throughput"
    }
  ],
  "model_version": "2.1.0",
  "last_trained": "2025-01-20T00:00:00Z",
  "data_sources": ["Historical patterns", "Real-time feeds", "Weather data"]
}
```

Error Responses

HTTP Status Codes

- 200 OK: Successful request
- 400 Bad Request: Invalid parameters
- 404 Not Found: Endpoint not found
- 429 Too Many Requests: Rate limit exceeded
- 500 Internal Server Error: Server error

Error Format

```
{
  "error": {
    "code": "INVALID_PARAMETER",
    "message": "The limit parameter must be between 1 and 1000",
    "details": {
      "parameter": "limit",
      "provided": 2000,
      "max_allowed": 1000
    }
  },
  "timestamp": "2025-01-26T10:30:00Z"
}
```

Rate Limiting

- **Development:** 1000 requests per hour
- **Production:** 10000 requests per hour with API key

Data Quality Metrics

- **Vessel Positioning:** Ocean-only coordinates validated
- **Disruption Sources:** 15+ authoritative maritime feeds
- **Update Frequency:** Real-time with 30-second intervals
- **Coordinate Accuracy:** $\pm 100\text{m}$ for vessel positions
- **Prediction Confidence:** Minimum 80% threshold

CORS Support

The API supports Cross-Origin Resource Sharing (CORS) for web applications.

Allowed Origins: * (development), specific domains (production) **Allowed Methods:** GET, POST, PUT, DELETE, OPTIONS **Allowed Headers:** Content-Type, Authorization, X-Requested-With

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