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import matplotlib.pyplot as plt
import numpy as np

# Data: Slope and Intercept for each decade and overall
data = {
    "Overall": {"slope": 0.00758088, "intercept": -14.7347},
    "1880s": {"slope": -0.0108485, "intercept": 20.229},
    "1890s": {"slope": 0.0178788, "intercept": -34.1084},
    "1900s": {"slope": -0.032303, "intercept": 61.2101},
    "1910s": {"slope": 0.0122424, "intercept": -23.7601},
    "1920s": {"slope": -0.000424242, "intercept": 0.581455},
    "1930s": {"slope": 0.0174545, "intercept": -33.8858},
    "1940s": {"slope": -0.0324242, "intercept": 63.0939},
    "1950s": {"slope": 0.0126667, "intercept": -24.804},
    "1960s": {"slope": -0.00509091, "intercept": 9.97109},
    "1970s": {"slope": 0.0142424, "intercept": -28.0867},
    "1980s": {"slope": 0.00636364, "intercept": -12.3816},
    "1990s": {"slope": 0.0149697, "intercept": -29.4741},
    "2000s": {"slope": 0.0168485, "intercept": -33.1888},
    "2010s": {"slope": 0.0391515, "intercept": -78.0667},
    "2020s": {"slope": -0.298, "intercept": 603.092}
}

# Function to plot the trend line
def plot_trend(decade, slope, intercept, start_year, end_year):
    years = np.arange(start_year, end_year + 1)
    temp_anomaly = slope * years + intercept
    plt.plot(years, temp_anomaly, label=f"{decade} Trend")

# Plotting each decade's trend
plt.figure(figsize=(12, 6))

for decade, values in data.items():
    # Assuming each decade starts at '0' and ends at '9' (e.g., 1880-1889)
    start_year = int(decade[:4]) if decade != "Overall" else 1880
    end_year = start_year + 9 if decade != "Overall" else 2029
    plot_trend(decade, values['slope'], values['intercept'],
start_year, end_year)

# Customizing the plot
plt.xlabel('Year')
plt.ylabel('Temperature Anomaly (°C)')
plt.title('Temperature Anomaly Trends by Decade')
plt.legend()
plt.grid(True)

plt.show()

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